

A Revised ESIA Volume III: Appendices

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TABLE OF CONTENTS

VOLUME III

LIST OF APPENDICES

VOLUME III-A

<i>Appendix 2-A</i>	<i>Newmont ESR Standards Summary</i>
<i>Appendix 3-A</i>	<i>Merian Gold Mine Project Key Characteristics of the Project</i>
<i>Appendix 3-B</i>	<i>Environmental Design Criteria</i>
<i>Appendix 3-C</i>	<i>Deposition Sequence Options Tailings Storage Facility - Technical Memorandum</i>
<i>Appendix 3-D</i>	<i>Merian Site-Wide Water Balance Model - Technical Memorandum</i>
<i>Appendix 3-E</i>	<i>Conceptual Closure and Reclamation Plan - Merian Gold Project</i>
<i>Appendix 6-A</i>	<i>Baseline Ambient Air Quality Monitoring Report</i>
<i>Appendix 9-A</i>	<i>Climate Summary - Precipitation, Temperature and Evaporation</i>
<i>Appendix 9-B</i>	<i>Baseline Hydrology Report</i>
<i>Appendix 9-C</i>	<i>Hydrogeology Baseline Report</i>

VOLUME III-B

<i>Appendix 9-D</i>	<i>Baseline Water Quality Summary Report</i>
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VOLUME III-C

<i>Appendix 10-A</i>	<i>Traffic Study, Traffic Count Data</i>
<i>Appendix 14-A</i>	<i>National and Regional Social Summary</i>
<i>Appendix 14-B</i>	<i>Data Collection Tools</i>
<i>Appendix 14-C</i>	<i>Health Interview Guide</i>
<i>Appendix 14-D</i>	<i>Questionnaire Household Survey Pamaka Area</i>
<i>Appendix 14-E</i>	<i>Social Baseline Data Collection Methodology</i>
<i>Appendix 14-F</i>	<i>ESIA Stakeholder Engagement Plan</i>
<i>Appendix 14-G</i>	<i>Public Meeting Records</i>

<i>Appendix 14-H</i>	<i>Notification of ESIA Public Meetings</i>
<i>Appendix 14-I</i>	<i>ESIA Public Meeting Materials</i>
<i>Appendix 16-A</i>	<i>Air Emission Calculation Sheets</i>
<i>Appendix 16-B</i>	<i>Evaluation of Ambient Air Quality Impacts for a Mining Project in Suriname</i>
 VOLUME III-D	
<i>Appendix 19-A</i>	<i>Preliminary Groundwater Flow Model – Technical Memorandum</i>
<i>Appendix 19-B</i>	<i>Pit Lake Water Balance Model – Technical Memorandum</i>
<i>Appendix 19-C</i>	<i>Geochemistry Baseline and Source Water Quality Predictions</i>



MERIAN GOLD PROJECT SURINAME

**Baseline Water Quality Summary Report
October 2011 to May 2012**

REPORT

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Project No. 113-93245.900

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Table of Contents

1.0	INTRODUCTION.....	1
2.0	SURFACE WATER QUALITY	2
2.1	Summary of Sampling Activities.....	2
2.1.1	November and December 2011 Sample Collection.....	2
2.1.2	March 2012 Sample Collection	2
2.2	Sampling Results	3
2.2.1	Field Water Quality Parameters.....	3
2.2.2	SVL Results	3
2.2.3	University of Suriname Laboratory Results	5
2.2.4	Inter-laboratory Comparison of TSS and TDS.....	5
3.0	GROUNDWATER QUALITY.....	6
3.1	Summary of Sampling Activities.....	6
3.1.1	October and November/December 2011 Sample Collection.....	6
3.1.2	January to May 2012 Sample Collection	7
3.2	Sampling Results	7
3.2.1	Field Water Quality Parameters.....	7
3.2.2	SVL Results	7
3.2.3	University of Suriname Laboratory Results	8
3.2.4	Inter-laboratory Comparison of TSS and TDS.....	8
4.0	SEDIMENT.....	10
4.1	Chemical Analysis.....	10
4.2	Grain Size Analysis	10
5.0	GENERAL DATA VALIDATION COMMENTS.....	11
5.1	Surface Water Duplicates	11
5.2	Groundwater Duplicates.....	11
5.3	Sediment Duplicates	12
5.4	Field to Laboratory Comparison.....	12
6.0	RECOMMENDATIONS.....	13
7.0	REFERENCES.....	14



List of Tables

Table 2-1	Surface Water Monitoring Location Details
Table 2-2	Surface Water Quality Field Parameter Results
Table 2-3	Surface Water Quality Monitoring SVL Analytical Results
Table 2-4	Surface Water Quality - University Laboratory Analytical Results and Comparison to SVL Analytical Results
Table 3-1	Groundwater Quality Monitoring Location Details
Table 3-2	Groundwater Field Parameter Results
Table 3-3	Groundwater Quality Monitoring – SVL Analytical Results
Table 3-4	Groundwater Quality – University Laboratory Analytical Results and Comparison to SVL Analytical Results
Table 4-1	Sediment Analysis Results, Sieve Size #10 (< 2 mm)
Table 4-2	Sediment Analysis Results, Sieve Size #230 (< 0.063 mm)
Table 5-1	Sample Data Validation Summary
Table 6-1	Recommended Analytical Parameters for Future Water Quality Monitoring

List of Figures

Figure 2-1	Water Quality Monitoring Locations
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List of Appendices

Appendix A	Raw Data Reports from Analytical Laboratories
Appendix B	Data Validation Reports
Appendix C	Sediment Grain Size Analysis Results



1.0 INTRODUCTION

Golder Associates Inc. (Golder) developed a Sampling and Analysis Plan (SAP) to guide baseline environmental hydrologic, hydrogeologic, and water quality monitoring for the Surgold Merian Gold (Merian) project (Golder 2012). The Merian project is located within the Surgold exploration concessions in eastern Suriname, as shown in Figure 1.1.

The baseline monitoring described in the SAP began in October 2011. Golder collected one round of surface water quality sampling in November and December 2011, monthly groundwater quality samples between October and December 2011, and sediment samples in October 2011. Sampling activities in 2012 were conducted by Surgold with the support of Tetra Tech. The 2012 sampling consisted of one round of surface water quality sampling in March, and monthly groundwater quality samples from January to May.

Both surface water and groundwater samples were tested for a variety of metals. Surface water samples were also tested for biological oxygen demand (BOD), total dissolved solids (TDS), total suspended solids (TSS), and chlorophyll and chlorine. Field parameters (pH, conductivity, temperature, dissolved oxygen (DO), Eh, and turbidity) were measured during both surface water and groundwater sampling. Sediment samples were analyzed for chemical contents and particle size.

Golder has compiled and performed limited data review and validation on all water quality data collected at the Merian site since October 2011. This report summarizes the analytical results of surface and groundwater quality data collected through May 2012.

This summary report is organized into the following sections:

- Section 2 – Surface Water Quality
- Section 3 – Groundwater Quality
- Section 4 – Sediment
- Section 5 – General Data Validation Comments
- Section 6 – Recommendations
- Section 7 – References

The following appendices contain supporting information:

- Appendix A – Raw Data reports from Analytical Laboratories
- Appendix B – Data Validation Reports
- Appendix C – Sediment Grain Size Analysis Results



2.0 SURFACE WATER QUALITY

2.1 Summary of Sampling Activities

Surface water samples were collected quarterly from 17 sites (Figure 2-1, Table 2-1). This report presents the results from surface water samples collected in November 2011 and March 2012. Water samples were analyzed by SVL Analytical (SVL) for the majority of analytes. SVL contracted Anatek Labs to analyze hexane extractable material. The University of Suriname (University Lab) analyzed total suspended solids (TSS), total dissolved solids (TDS), and biological oxygen demand (BOD) because the holding times for these analytes are exceeded during shipping to SVL. Copies of all laboratory reports are provided in Appendix A and data validation reports are provided in Appendix B.

2.1.1 November and December 2011 Sample Collection

Golder collected surface water samples between November 16 and November 26, 2011 and collected one sample (SW-28) on December 16, 2011. Golder field staff provided training to Surgold staff during the sample collection. Samples were collected at all of the 17 surface water monitoring stations as specified in the SAP (Golder 2012). Multiple samples were collected at several locations as follows:

- Duplicate cyanide samples were collected at SW-23 (11262011SW022) and SW-21 (11262011SW023) on November 26, 2012 because of sample preservation issues.
- Additional samples were collected at SW-04B (ID# 11192011SW005, 11152011SW009) and SW-37 (11152011SW010) for analysis of TSS and turbidity only; this was done to calibrate the automated turbidity sensors installed at these sites.

The sampling followed the methods put forth in the SAP (Golder 2012) and analytical parameters match those specified in Table 2-5 of the SAP, with the following exceptions:

- Only two samples (SW-34 and SW-37) were tested for BOD because of the short holding time and the testing capacity at the University Lab.
- Samples were not tested for chlorine because of short holding times.
- Samples were not tested for e-coli and coliform because of short holding times.

Following the November/December sampling, a field meter was purchased to measure chlorophyll-a in the field, and field test kits were purchased to analyze for chlorine, coliform, and e-coli in the field.

2.1.2 March 2012 Sample Collection

Quarterly surface water quality sampling was scheduled for February 2012. Due to logistical constraints this sampling round was completed in early March 2012 (March 2 to March 5). Samples were collected by Tetra Tech and Surgold. The sampling followed the methods detailed in SAP (Golder 2012) and analytical parameters match those specified in Table 2-5 of the SAP, with the following exceptions:



- No samples were collected at SW-27 or SW-29 because active artisanal mining activities prevented access to those sites.
- No samples were analyzed for coliform or e-coli.
- No samples were analyzed for BOD.
- Chlorine was measured with a field test kit (not laboratory analyzed).

2.2 Sampling Results

2.2.1 Field Water Quality Parameters

The measurements of the water quality parameters for both the November/December 2011 and March 2012 surface water field sampling rounds are provided in Table 2-2. The November/December 2011 samples show pH values near neutral at all sites ranging from 5.03 to 7.89 standard units (s.u.); conductivity values were consistently low (less than 62.1 microSiemens/centimeter, $\mu\text{S}/\text{cm}$). The November/December 2011 turbidity varied from less than 10 to over 400 nephelometric turbidity units (NTU), with the higher values measured at sites downstream of recent artisanal mining activities.

The field pH values for the March 2012 sampling event ranged from 3.62 to 5.96, which are considerably lower than the November/December 2011 measurements. A review of the field data sheets indicates that the pH meter was not calibrated properly during the March 2012 sampling round. Therefore the March 2012 field parameter pH measurements are likely erroneous. The laboratory-measured pH values (presented below and in Table 2-3) ranged from 5.37 to 6.53. The laboratory values are more consistent with the pH values from the 2010 baseline data collection and the November/December 2011 samplings, which ranged between 5.73 and 6.73 (Tetra Tech 2010).

The March 2012 turbidity varied from less than 5 to nearly 6,000 NTU, with the higher values measured at sites downstream of recent artisanal mining activities. The March 2012 trends are similar to November/December 2011; however, higher turbidity values were recorded at some locations (> 5,000 NTU at SW-4B), presumably due to an increase in flows and sediment loads during the wet season.

The March 2012 sampling round also included field measurements of chlorophyll and chlorine (free and total). The chlorophyll values ranged from approximately 1 to 41 ppm. Total chlorine values ranged from 0.01 to 0.38 milligrams per liter (mg/L), while free chlorine was measured from 0.00 to 0.18 mg/L.

2.2.2 SVL Results

The results from surface water samples submitted to SVL are provided in Table 2-3. Generally, low concentrations of metals were found at most locations. There were no detections of the following metals¹ at any location sampled: antimony, dissolved arsenic, beryllium, boron, cadmium, dissolved chromium,

¹ Dissolved and total fractions were not detected if not specified in this list.



dissolved cobalt, dissolved copper, dissolved lead, dissolved mercury, molybdenum, dissolved nickel, selenium, silver, thallium, dissolved titanium, dissolved uranium, dissolved vanadium, and dissolved zinc.

Table 2-3 shows some metals were above detection limits, with some variability between sites and sample dates. In general, higher metal concentrations were measured at sites SW-04B, SW-23, SW-27, SW-29, and SW-31. Qualitative field observations indicate that these sites may be close to recent or active artisanal mining activities.

Most, if not all, of the monitoring sites appear to have been impacted by artisanal mining activities, to some extent. The magnitudes of the impacts on site water quality appear to be a function of the proximity to the disturbance, both in terms of distance and time. Increased suspended sediment is indicative of artisanal mining impacts and elevated turbidity and total suspended sediment (TSS) concentrations were measured at each of the above-mentioned sites (Table 2-3). Sites SW-15, SW-28, SW-35, SW-37, and SW-38 had relatively low turbidity and TSS (less than a field- or lab-measured turbidity of 100 NTU or a TSS concentration of 100 mg/L). Therefore these sites are presumed to be the least impacted by artisanal mining.

Elevated lab-measured pH was found at SW-04B, SW-23, and SW-31. The pH for these sites was measured at 11.21 (March 2012), 13.03 (March 2012), and 13.48 (November 2011), respectively. These were the only measurements at any sites that had pH above 7.0 s.u. The magnitude of the results suggests that the results are erroneous and possibly due to sample contamination.

Similar to the field measurements of turbidity, there was wide variability in the results of the SVL turbidity analyses (<5 to over 11,000 NTU). The highest values were measured at sites downstream of active artisanal mining activities, such as SW-4B. Similar trends were evident in the results for Total Suspended Solids (TSS).

All forms of free, total and Weak Acid Dissociable (WAD) cyanide were below the detection limit of 0.005, 0.01, and 0.01 mg/L respectively at all sites.

Field blanks were analyzed in November/December 2011 and March 2012. The following analytes were detected in field blanks:

- November/December 2011: dissolved and total barium (less than the detection limit of 0.002 mg/L in March), bicarbonate, dissolved and total calcium, chloride, total chromium, dissolved and total copper, hardness as CaCO₃, dissolved and total magnesium, dissolved and total manganese, total mercury, nitrate/nitrite, dissolved and total potassium, dissolved and total silicon, dissolved and total sodium, sulfate, total alkalinity, total dissolved solids, total and dissolved zinc.
- March 2012: chloride, nitrate/nitrite, dissolved silicon, total sodium, and sulfate.



2.2.3 University of Suriname Laboratory Results

Results for the surface water samples submitted to the University Lab are presented in Table 2-4. The University Lab analyzed the samples for BOD, TSS and TDS.

For the November 2011 sampling, two samples were sent to the University Lab for BOD analysis. The samples were collected at SW-37 and SW-34 and the results were 1.5 and 1.3 mg/L, respectively.

For the March 2012 sampling, six duplicate samples were sent to the University Lab for TSS and TDS analyses. All of the March 2012 TSS and TDS analyses at the University Lab were completed past the recommended holding times of seven days. No samples were submitted in March 2012 for BOD analysis.

2.2.4 Inter-laboratory Comparison of TSS and TDS

The relative percent differences (RPD) for TDS and TSS for the University Lab and SVL results are shown in Table 2-4. Comparisons indicate a RPD of between 3% to 164% for TSS values, with the greatest difference in SW-32. The calculated RPD for TDS was between 13% to 137%, with the greatest difference occurring in SW-23. The duplicate analyses performed at the University Lab show considerable variability between the duplicate samples. This variability adds to the uncertainty in the accuracy of the University Lab results.

Golder has had no prior experience with the University Lab and the testing methodologies and laboratory conditions cannot be verified. Golder has worked extensively with SVL on other projects where they have performed satisfactorily. Because of the uncertainty with the University Lab, there is a higher degree of confidence in the SVL results, despite the holding time exceedances.



3.0 GROUNDWATER QUALITY

3.1 Summary of Sampling Activities

Groundwater samples were collected from up to nine wells (Figure 2-1, Table 3-1) from October 2011 through May 2012. Seven wells were sampled in October 2011. After the October sampling, two additional wells were installed and developed; these wells were included in the sampling rounds starting in November/December 2011.

Groundwater quality samples were analyzed by SVL for a suite of chemical parameters defined in the SAP (Golder 2012). For the November/December 2011 and February 2012 sampling events, the University Lab analyzed the water samples for TSS, TDS, and phosphorous compounds. Copies of all laboratory reports are provided in Appendix A.

Groundwater samples were collected during seven sampling events, as follows:

- October 2011: Eight samples collected between October 27 and November 1.
- November/December 2011: Eight samples (plus one duplicate and two field blanks) collected on November 19 and between December 8 and December 14.
- January 2012: Nine samples (plus one duplicate) collected between January 23 and January 27.
- February 2012: Nine samples (plus one duplicate) collected between February 23 and February 27.
- March 2012: Ten samples (plus one duplicate) collected between March 27 and March 30. This includes an extra sample collected from an artesian borehole (NADD-1298) that was observed during exploratory drilling near the proposed Merian II pit. The borehole was abandoned after drilling and therefore was not sampled again during subsequent sampling rounds.
- April 2012: Nine samples collected between April 24 and April 28.
- May 2012: Nine samples (plus one duplicate) collected between May 15 and May 19.

3.1.1 October and November/December 2011 Sample Collection

Golder was responsible for all groundwater sampling activities in October and November/December 2011. Golder field staff provided training to Surgold staff during the November/ December sampling round, and Surgold staff or their subconsultant was responsible for subsequent sampling. Samples were collected at nine of the groundwater monitoring stations as specified in the SAP (Golder 2012); the remaining monitoring wells listed in the SAP were not sampled because the wells were either not drilled or not fully developed prior to sampling activities.

The sampling methodology followed the methods detailed in SAP and analytical parameters match those specified in Table 2-5 of the SAP, with the following exceptions:



- No field blanks or duplicate samples were collected during the October 2011 sampling round.
- None of the October 2011 or January 2012 samples were sent to the University Lab for analysis.

3.1.2 January to May 2012 Sample Collection

The January, April, and May 2012 samples were collected by Surgold. The February and March 2012 samples were collected by Tetra Tech and Surgold. The sampling methodology followed the methods detailed in the SAP (Golder 2012) and analytical parameters match those specified in Table 2-5 of the SAP, with the following exceptions:

- No blanks (field or equipment) were collected during these sampling events.
- Golder collected a groundwater quality sample from exploration borehole NADD-1298, located in the Merian II pit areas, on March 26, 2012. The borehole was flowing at the time of sample collection.

3.2 Sampling Results

3.2.1 Field Water Quality Parameters

The results of the field water quality parameter measurements for all groundwater sampling events are provided in Table 3-2. Field measurements (pH, conductivity, temperature, dissolved oxygen (DO), Eh, and turbidity) were measured at each monitoring well during each sampling round. During most sampling events, pH values ranged from 5 to 7.9 in groundwater. A pH of 2.45 was measured in well TSF-TW-2 during the January 2012 sampling event, but this reading is likely erroneous because field notes indicate the pH meter was not calibrated properly.

Turbidity values were generally below approximately 20 NTU. Of the 60 groundwater samples collected between October 2011 and March 2012, 14 of the measurements exceeded 20 NTU and the range of these samples was 27 and 330 NTU.

3.2.2 SVL Results

Low concentrations of metals were found at most locations (Table 3-3). There were no detections of the following metals² at any location sampled: antimony, arsenic, boron, cadmium, chromium, cobalt, lead, mercury, dissolved nickel, selenium, silver, thallium, dissolved uranium, and dissolved vanadium. In general, the highest metal concentrations were detected in wells TSF-TW-3 and TSF-TW-5. TSF-TW-3 contained the highest concentration of TSS and total recoverable iron, and had the lowest alkalinity.

² Dissolved and total fractions were not detected if not specified in this list.



Nitrate/nitrite as nitrogen was detected in some samples, but detectable amounts did not exceed 0.35 mg/L, with the exception of TSF-TW-3 (0.673 and 0.911 mg/L during the November/December 2011 and January 2012 sampling events).

Total cyanide concentrations were below the detection limit (see Table 3-3) for most samples. The following samples had total cyanide concentrations above the limit:

- October 30, 2011 sample at MA-PZ1-TW1 had a free cyanide concentration of 0.039 mg/L.
- January 24, 2012 sample at TSF-TW5 had a free cyanide concentration of 0.007 mg/L.
- March 28, 2012 sample at TSF-TW3 had a WAD cyanide concentration of 0.167 mg/L.

Analyses of samples from wells TSF-TW-2R and TSF-TW-7 did not include total recoverable metals during the November/December 2011 sampling event.

During the May 2012 sampling event, turbidity was not reported for any laboratory samples analyzed. Only field measured turbidity is available for the May 2012 groundwater sampling. During previous sampling rounds, turbidity was measured both in the field and laboratory.

One field blank and one equipment blank were collected during the December 2011 sampling event, and the following analytes were detected:

- Field blank: barium, bicarbonate, calcium, chloride, copper, magnesium, nitrate, silicon, sulfate, and zinc.
- Equipment blank: barium, bicarbonate, calcium, chloride, copper, magnesium, nitrate, silicon, sulfate, and zinc.

3.2.3 University of Suriname Laboratory Results

The University of Suriname Laboratory was contracted to analyze groundwater samples for TDS and TSS, as well as phosphorous species. The analyses were completed for the November/December 2011 and February through May 2012 sampling events. All TSS and TDS analyses were completed past the recommended holding times (seven days). TDS and TSS concentrations were generally the highest in TSF-TW-3 and lowest in TSF-TW-2R (Table 3-4). This is consistent with analytical results from SVL that also indicated high TDS and TSS in TSF-TW-3.

The University Lab analyzed eight groundwater samples from November/December 2011 for phosphate and phosphorus. All results were below 1 mg/L (Table 3-4).

3.2.4 Inter-laboratory Comparison of TSS and TDS

Comparison of SVL and University Lab TSS and TDS results indicate a RPD of between 0% to 189% for TSS values, with the greatest difference in TSF-TW-5. The calculated RPD for TDS was between 1% to



121%, with the greatest difference in TSF-TW-3 (March and May). Comparisons indicated a large difference in reported TSS and TDS between the two laboratories, with many samples showing greater than 100% difference in values. TDS measurements were generally in better agreement than TSS between the two labs. The relatively poor agreement between reported TSS and TDS values could be attributed to inadequate validation of laboratory procedures, laboratory error, the samples being analyzed past holding times, or a combination of these factors.



4.0 SEDIMENT

Sediment samples were collected at all surface water monitoring stations during the October 2011 sampling round. The sediment sample collection followed the methodology outlined in the SAP (Golder 2012). Samples were split in half in the field, with half of the sample sent to SVL for chemical analyses and the other half sent to the Golder Geotechnical Laboratory in Houston, Texas for particle size analysis.

The samples at SVL were sieved so that only the finer portions of the sample were analyzed. Two grain-size fractions were analyzed at SVL: a #10 sieve (<2 mm) was used for the first analysis and a #230 sieve (<0.063 mm) was used for the second analysis.

4.1 Chemical Analysis

The results of the chemical analyses for the sediment samples are presented in Tables 4-1 and 4-2, which show the results for #10 sieve and #230 sieve samples, respectively. Metal concentrations were higher in the #230 sieve samples. This is expected, as trace metal concentrations will typically increase as grain size decreases. Relatively high concentrations of aluminum and iron were measured in all the samples, due to the geochemical composition of the saprolite soils in the area. The following metals were detected in most samples: arsenic, chromium, copper, lead, manganese, mercury, nickel, selenium, vanadium, and zinc. In general, higher metals concentrations were found at sites more heavily disturbed by artisanal mining activities, such as SW-4B and SW-4A.

All of the samples tested for total cyanide and WAD cyanide were below detection limits. For free cyanide, all of the #230 sieve samples were below detection limits but three of the samples from the #10 sieve were slightly above the <1 mg/kg detection limit.

4.2 Grain Size Analysis

The results of the grain size analyses are presented on grain size distribution plots in Appendix C. Grain size analyses were completed at all sites except SW-27. The plots show that majority of the samples are comprised of sand-size and finer sediment. All but two samples (SW-38 and SW-28) had a D_{50} value equivalent to fine sand or finer material, meaning that at least half the sample was composed of fine sand, silt-, or clay-sized particles.



5.0 GENERAL DATA VALIDATION COMMENTS

In accordance with the SAP (Golder 2012), all data packages from SVL were reviewed and had the following elements checked:

- Assessment of completeness: checking that all requested analyses were performed.
- Assessment of holding times: comparison of analytical method holding time to actual time elapsed between collection and analysis.
- Field duplicate sample evaluation: comparison of duplicate samples to ensure that the RPD for all analytes were within 20%.
- Charge balance errors: checking that the laboratory-calculated charge balance errors were less than 10%.
- Blank samples: checking that compounds were not detected in the blank samples, either collected from the field or laboratory blanks.
- Laboratory versus field analyses: comparison of field and laboratory measurements of pH, conductivity, and TDS.
- Comparison of total and dissolved metal concentrations: checking that total recoverable concentrations of metals were greater than dissolved (filtered) concentrations of metals, within a RPD of 20%.
- Inter-laboratory comparisons: comparing the measurements of phosphorus, TSS and TDS by the University Lab, with the measurements by SVL (which generally were outside the recommended holding times for these analytes because of shipping times).

A summary of these reviews is presented in Table 5-1. A copy of the detailed data validation memos for each dataset is provided in Appendix B. Generally, all data packages were complete, charge balance errors were acceptable, laboratory versus field measurements were acceptable, and total concentrations of metals were greater than dissolved concentrations. The analyses of TDS and TSS were performed after the recommended holding times of seven days for almost all samples because of shipping times to the laboratories.

Reviews indicated several minor data quality issues with the data analyses completed by SVL, but no major complications that would severely affect overall data comparison and interpretation. The University Lab results were not validated because the lab reports provided insufficient information to validate.

5.1 Surface Water Duplicates

In surface water samples, the field duplicate RPDs ranged from 0% to 107%. The surface water field duplicate analytes with average RPDs greater than 20% were ammonia, hexane extractable material, TDS, and TSS.

5.2 Groundwater Duplicates

In groundwater samples, the field duplicate RPDs ranged from 0% to 187%. The groundwater field duplicate analytes with average RPDs greater than 20% were total aluminum, dissolved and total iron,



dissolved and total magnesium, total silver, dissolved and total sodium, dissolved and total zinc, dissolved calcium, hardness, sulfate, TSS, and turbidity. The differences in the metals were related to instances where a measured concentration was found in one sample but not the duplicate, or where the detected concentrations were close to (within five times) the detection limit.

5.3 Sediment Duplicates

For sediment, field duplicate comparison RPDs ranged from 0% to 82%. The sediment analytes with maximum RPDs greater than 20% were lead, total organic carbon, total organic matter, and zinc.

5.4 Field to Laboratory Comparison

The ratio of the field-to-laboratory values measured in surface water ranged from 0.65 to 1.21 for pH and 0.75 to 1.43 for specific conductance. The ratio of the field-to-laboratory values measured in groundwater ranged from 0.04 to 0.99 for pH and 0.01 to 1.96 for specific conductance. These differences are most likely related to the long holding times that occurred during shipment from the site to the analytical laboratory.



6.0 RECOMMENDATIONS

This report presents the results of the October 2011 to March 2012 surface water, groundwater, and sediment sampling at the Merian site, as well as comparisons of reported TDS and TSS values between two laboratories (SVL and the University Lab).

Based on these results, Golder recommends that the sampling program continue to follow the SAP (Golder 2012) on the following points:

- The surface water monitoring should be continued at the same locations and frequency (quarterly) as described in SAP (Golder 2012).
- Sediment samples should be collected annually and analyzed in accordance with the SAP (Golder 2012).
- Groundwater sampling should also be conducted on a quarterly basis. All of the wells listed in Table 3-1 and shown in Figure 2-1 should be sampled, including the two wells at Merian I (M1-TW-1 and M1-TW-2) and the well between the east and central waste rock dumps (WS-TW-1).

Golder also recommends a slight reduction in the water quality analytical parameters. The recommended analytical parameters are summarized in Table 6-1. The following changes from the analytical parameters listed in the SAP (Golder 2012) are recommended:

- Remove total coliform, e-coli, and chlorine from the surface water sampling program.
- Eliminate the University Lab analyses (BOD, TSS, and TDS for surface water and TDS and TSS for groundwater) and use SVL lab exclusively for all water quality analyses at the site.
- Remove dissolved metal analyses from the groundwater sampling program, and analyze total metals only.



7.0 REFERENCES

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Tetra Tech. 2011. November 2010 Surface Water, Sediment and Groundwater Sampling Report with Trend Analysis.

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TABLES

Table 2-1: Surface Water Monitoring Location Details

Station ID	Site Area/Location	Drainage Basin	Type of Monitoring			Location		Note
			Water Quality	Stream Gauge	Continuous Turbidity	UTM East	UTM North	
SW-04A	Offsite Merian Creek	Marowijne	Yes	No	No	783,197	564,823	Located at bridge crossing on lower Merian Creek
SW-04B	Tomulu Creek	Marowijne	Yes	Yes	Yes	777,698	561,670	Stream gauge and turbidity monitoring added to existing location
SW-13	Unnamed Merian Creek Trib	Marowijne	Yes	No	No	775,685	564,298	
SW-15	Unnamed Merian Creek Trib	Marowijne	Yes	No	No	771,482	568,406	Located upstream of Maraba Pit
SW-21	Unnamed Merian Creek Trib	Marowijne	Yes	No	No	774,815	565,614	SW-21 was moved a few years ago, so it no longer conflicts with NWSF.
SW-23	Unnamed Merian Creek Trib	Marowijne	Yes	No	No	773,322	567,629	Will be disturbed by NWSF and eventually replaced by SW-31
SW-26	Unnamed Merian Creek Trib	Marowijne	Yes	No	No	775,116	566,786	Will be disturbed by NWSF and eventually replaced by SW-32
SW-27	Las Dominicanas Creek	Commewijne	Yes	No ⁵	Yes	766,982	566,909	Stream gauge and turbidity monitoring added to existing location - Site affected by artisinal mining activity
SW-28	SF A3 Creek Trib	Commewijne	Yes	No	No	770,151	562,160	Access is difficult. Very small drainage area; likely dry most of year
SW-29	Tempati Creek	Commewijne	Yes	No	No	767,162	567,228	Site affected by artisinal mining activity
SW-30	Las Dominicanas Creek	Commewijne	Yes	Yes	No	767,185	564,605	
SW-31	Unnamed Merian Creek Trib	Marowijne	Yes	No	No	775,722	567,603	Replaces SW-23
SW-32	Unnamed Merian Creek Trib	Marowijne	Yes	No	No	775,340	566,667	Replaces SW-26
SW-34	Merian Creek	Marowijne	Yes	Yes	Yes	779,071	562,498	
SW-35	NF A3 Creek	Commewijne	Yes	Yes	No	769,054	564,802	
SW-37	North NF A3 Creek	Commewijne	Yes	No	Yes	769,054	564,802	
SW-38	SF A3 Creek	Commewijne	Yes	No ⁵	No	768,606	564,149	Located at the main embankment for TSF Option 2A

Notes:

1. TSF-2A is Tailings Storage Facility Option 2A.
2. Will be sampled at the same time as SW-31 on one sampling round (at least) before elimination.
3. Will be sampled at the same time as SW-32 on one sampling round (at least) before elimination.
4. NWSF is North Waste Rock Storage Facility
5. Stream gauges were installed/planned at these sites but the areas were disturbed by artisinal mining and no stream gauges were installed at these sites at this time of this report (September 2012).

Table 2-2: Surface Water Quality Field Parameter Results

November 2011 Surface Water Sampling											
Sample Collection Date	Sample #	Stream Name	Site ID	pH	Conductivity (uS/cm)	Temperature (°C)	DO (mg/L)	Eh (rel mV)	Turbidity (NTU)	Chlorophyll (ppm)	Chlorine Free/Total (mg/L)
16-Nov-11	11162011SW001	NF A3 Creek	SW-35	6.57	32.9	27.2	NM	398.5	20.8	NM	NM
16-Nov-11	11162011SW002	North NF A3 Creek	SW-37	6.4	32.5	26.4	NM	394.2	9.16	NM	NM
16-Nov-11	11162011SW003	SF A3 Creek	SW-38	6.05	30.3	28	5.8	744	32.5	NM	NM
18-Nov-11	11182011SW004	Tomulu Creek	SW-04B	6.31	30.6	28.8	NM	531	NA	NM	NM
20-Nov-11	11202011SW006	Unnamed Merian Creek Trib	SW-15	6.71	35.4	29	4.5	392.5	46	NM	NM
20-Nov-11	11202011SW007	Unnamed Merian Creek Trib	SW-26	6.69	56.9	32.5	4.4	364.1	177	NM	NM
20-Nov-11	11202011SW008	Unnamed Merian Creek Trib	SW-32	6.75	58.2	32.7	4.7	286.7	218	NM	NM
21-Nov-11	11212011SW011	Unnamed Merian Creek Trib	SW-23	6.53	62.1	34.6	5.2	344.7	46.4	NM	NM
21-Nov-11	11212011SW012	Unnamed Merian Creek Trib	SW-13	6.39	39.5	32.9	6.1	379.1	27.6	NM	NM
21-Nov-11	11212011SW013	Unnamed Merian Creek Trib	SW-21	7.89	35.5	32.4	6.7	374.9	24	NM	NM
22-Nov-11	11222011SW015	Tempati Creek	SW 29	6.15	31.2	32.6	5.2	408.3	NM	NM	NM
24-Nov-11	11242011SW017	Las Dominicanas Creek	SW-27	5.96	27.2	28.6	6.8	374.8	NM	NM	NM
24-Nov-11	11242011SW018	Merian Creek	SW-34	6.14	41.7	25	5.5	408.3	NM	NM	NM
24-Nov-11	11242011SW019	Unnamed Merian Creek Trib	SW-31	6.29	55.5	28.6	6.3	433.7	19.3	NM	NM
25-Nov-11	11252011SW020	Offsite Merian Creek	SW-4A	6.38	33.8	27.3	6.0	466.6	444	NM	NM
26-Nov-11	11262011SW021	Las Dominicanas Creek	SW-30	6.09	24.52	24.8	5.6	481.4	282	NM	NM
16-Dec-11	12162011SW025	SF A3 Creek Trib	SW-28	5.03	25.39	24.3	4.4	323.4	2.21	NM	NM

February/March Surface Water Sampling											
Sample Collection Date	Sample #	Stream Name	Site ID	pH	Conductivity (uS/cm)	Temperature (°C)	DO (mg/L)	Eh (rel mV)	Turbidity (NTU)	Chlorophyll (ppm)	Chlorine Free/Total (mg/L)
2-Mar-12	02MAR2012SW001	Unnamed Merian Creek Trib	SW-13	4.86	25.81	NM	6.9*	NA	182	NM	0.04/0.10
2-Mar-12	02MAR2012SW002	Unnamed Merian Creek Trib	SW-21	4.92	27.79	NM	6.6	NA	74	NM	0.05/0.12
2-Mar-12	02MAR2012SW003	Unnamed Merian Creek Trib	SW-26	5.19	35.6	33.6	6.9	214.4	899	15.4	0.00/0.01
2-Mar-12	02MAR2012SW004	Unnamed Merian Creek Trib	SW-32	5.25	37.1	30.7	6.4	123.9	1044	16.6	0.00/0.05
3-Mar-12	03MAR2012SW005	Unnamed Merian Creek Trib	SW-23	4.24	50.5	NM	6.6	303.4	109	3.8	0.04/0.08
3-Mar-12	03MAR2012SW006	Unnamed Merian Creek Trib	SW-15	4.69	27.04	28.7	6.6	304.7	71.7	6	0.06/0.07
4-Mar-12	04MAR2012SW007	SF A3 Creek Trib	SW-28	3.62	21.96	23.1	5.2	434.3	2.68	0.8	0.05/0.10
4-Mar-12	04MAR2012SW008	Las Dominicanas Creek	SW-30	4.45	22.63	24.2	6.2	306.1	664	17.3	0.13/0.13
4-Mar-12	04MAR2012SW009	SF A3 Creek	SW-38	4.61	27.04	26.9	6.2	309.4	68.6	2.6	0.18/0.11
4-Mar-12	04MAR2012SW010	NF A3 Creek	SW-35	4.65	30	26	6.2	310.3	62.3	2.5	0.14/0.04
4-Mar-12	04MAR2012SW011	North NF A3 Creek	SW-37	4.5	28.88	NM	6.4	321.3	24.1	1.2	0.01/0.04
5-Mar-12	05MAR2012SW012	Unnamed Merian Creek Trib	SW-31	5.96	41.9	26.1	6.1	13.5	377	9.6	0.08/0.14
5-Mar-12	05MAR2012SW013	Tomulu Creek	SW-4B	4.25	24.2	NM	6.5	46.9	5960	40.6	0.13/0.38
5-Mar-12	05MAR2012SW014	Merian Creek	SW-34	4.56	33.9	31.71	6.4	44.5	188	6.4	0.00/0.08
5-Mar-12	05MAR2012SW015	Offsite Merian Creek	SW-04A	4.6	32.4	NM	6.8	44.7	685	15.4	0.15/0.16
--	--	Las Dominicanas Creek	SW-27								Site not sampled due to active artisanal mining
--	--	Tempati Creek	SW-29								Site not sampled due to active artisanal mining

Notes:

NM: Not measured

Ph field meter was not calibrating properly during March 2012 sampling; results appear erroneous.

* = Temperature assumed to be 25 Celsius

Grey shading indicates that original dissolved oxygen values were converted from % into mg/L in accordance with EPA Guidelines:

http://science.nature.nps.gov/im/units/ncpn/Tools/DO/DO_Calculator_v2.1_Readme.doc

Table 2-4: Surface Water Quality - University Laboratory Analytical Results and Comparison to SVL Analytical Results

Sample Date	Sample ID	Site ID	Stream Name	Biological Oxygen Demand (BOD, mg/L)	TSS (mg/L)		Relative Percent Difference	TDS (mg/L)		Relative Percent Difference
				University Lab	University Lab	SVL Lab		University Lab	SVL Lab	
November 2011 Surface Water Samples										
22-Nov-11	11162011SW014	SW-37	North NF A3 Creek	1.5	nm	nm	nm	nm	nm	nm
23-Nov-11	11232011SW016	SW-34	Merian Creek	1.3	nm	nm	nm	nm	nm	nm
March 2012 Surface Water Samples										
2-Mar-12	02MAR2012SW002	SW-21	Unnamed Merian Creek Trib	nm	22	19	15%	45	51	13%
2-Mar-12	02MAR2012SW002	SW-21	Unnamed Merian Creek Trib	nm	28		38%	41		22%
2-Mar-12	02MAR2012SW001	SW-13	Unnamed Merian Creek Trib	nm	78	89	13%	50	34	38%
2-Mar-12	02MAR2012SW001	SW-13	Unnamed Merian Creek Trib	nm	86		3%	39		14%
2-Mar-12	02MAR2012SW003	SW-26	Unnamed Merian Creek Trib	nm	531	896	51%	167	39	124%
2-Mar-12	02MAR2012SW003	SW-26	Unnamed Merian Creek Trib	nm	560		46%	180		129%
2-Mar-12	02MAR2012SW004	SW-32	Unnamed Merian Creek Trib	nm	720	71	164%	165	62	91%
2-Mar-12	02MAR2012SW004	SW-32	Unnamed Merian Creek Trib	nm	660		161%	165		91%
2-Mar-12	02MAR2012SW006	SW-15	Unnamed Merian Creek Trib	nm	25	15	50%	135	39	110%
2-Mar-12	02MAR2012SW006	SW-15	Unnamed Merian Creek Trib	nm	20		29%	170		125%
2-Mar-12	02MAR2012SW005	SW-23	Unnamed Merian Creek Trib	nm	20	33	49%	170	32	137%
2-Mar-12	02MAR2012SW005	SW-23	Unnamed Merian Creek Trib	nm	60		58%	130		121%

Notes:

NM = analyte not measured

Shaded cells exceed 20% RPD criteria

Table 3-1: Groundwater Quality Monitoring Location Details

No.	Well ID	Site Area/Location	Total Depth (m)	Screen Interval (m)	Completion	Location		Status
						UTM East	UTM North	
1	TSF-MW-1	Tailings Storage Facility	40	34-40	Saprock	768,320	565,040	Drilled in 2011
2	TSF-TW-2		32	22-31	Saprolite-QV	768,520	564,240	Drilled in 2011
3	TSF-TW-2R		34	18-33	Saprolite-QV	768,570	564,263	Drilled in 2011, Replacement Well for TSF-TW-2
4	TSF-TW-3		50	26-38	Saprolite-QV	767,660	563,299	Drilled in 2011
5	TSF-TW-5		46	37-43	Saprock	770,480	561,600	Drilled in 2011
6	TSF-TW-7		50	41-50	Bedrock	768,750	564,930	Drilled in 2011
7	M2-PZ1-TW1	Merian II	97	84-96	Bedrock	772,790	566,049	Drilled in 2008
8	MA-PZ1-TW1	Maraba	63	47-62	Bedrock	773,077	567,635	Drilled in 2008
9	MA-TW-6		79	43-61	Bedrock	771,920	568,380	Drilled in 2011

Notes:

1. Well depths and screen intervals are in meters below ground surface.
2. QV- indicates wells that are completed in quartz veins.

Table 3-2: Groundwater Field Parameter Results

Sample Collection Date	Site ID	Sample #	pH	Conductivity (uS/cm)	Temperature (°C)	DO (mg/L)	Eh (rel mV)	Turbidity (NTU)
October 2011 Sampling								
30-Oct-11	TSF-MW-1	TSF-MW-1	6.28	145	26.8	6.7	NM	13
28-Oct-11	TSF-TW-2	TSF-TW-2 (original well)	5.05	37	27.2	5.7	NM	35
1-Nov-11	TSF-TW-2R	TSF-TW-2R	5.21	45	25.4	6.7	NM	3.9
27-Oct-11	TSF-TW-3	TSF-TW-3	5.67	55	28.8	5.6	NM	159
31-Oct-11	TSF-TW-5	TSF-TW-5	6.53	197	28.2	5.2	NM	12
30-Oct-11	TSF-TW-7	TSF-TW-7	6.48	239	26.1	5.3	NM	14.9
30-Oct-11	MA-PZ1-TW1	MA-PZ1-TW1	6.91	373	28.1	1.4	NM	15.6
29-Oct-11	M2-PZ1-TW	M2-PZ1-TW1	6.69	255.6	26.2	2.0	NM	20.6
November/December 2011 Sampling								
19-Nov-11	TSF-TW-7	11192011GW001	6.37	250.2	26	1.0	78.3	9.85
19-Nov-11	TSF-TW-2R	11192011GW002	5.58	80.6	26.9	2.6	358.9	10.3
8-Dec-11	TSF-TW-5	TSF-TW-5	5.93	176.5	26.7	NM	331.2	6.6
13-Dec-12	TSF-MW-1	TSF-MW-1	6.22	221.7	29	1.6	180.8	8.61
13-Dec-12	TSF-TW-3	TSF-TW-3	6.72	379	23.8	1.7	25.2	124
11-Dec-12	MA-PZ1-TW1	MA-PZ1-TW1	6.69	380	28.5	2.0	-49.6	10.92
11-Dec-12	M2-PZ1-TW1	M2-PZ1-TW1	7.05	443	25.3	1.1	-77.4	30.3
11-Dec-12	MA-TW-6	MA-TW-6	7.22	408	26.3	0.8	90.1	80
January 2012 Sampling								
24-Jan-12	TSF-TW-3	TSF-TW-3	7.87	96.6	25	1.2	465.5	NM
27-Jan-12	TSF-TW-2R	TSF-TW-2R	NM	46.5	26.6	2.7	425	7.56
27-Jan-12	TSF-TW-2	TSF-TW-2	2.45	86.4	25	5.8	442.8	8
26-Jan-12	MA-TW-6	MA-TW-6	7.41	460	25	0.6	67.3	9.09
26-Jan-12	M2-PZ1-TW1	M2-PZ1-TW1	6.74	262.7	25	2.3	156.5	6.24
24-Jan-12	TSF-TW-5	TSF-TW-5	6.09	182.4	25	6.8	234.4	6.21
25-Jan-12	MA-PZ1-TW1	MA-PZ1-TW1	6.78	38.7	25	0.8	157.5	1.08
25-Jan-12	TSF-TW-7	TSF-TW-7	7.71	NM	25	1.6	478.2	1.35
25-Jan-12	TSF-MW-1	TSF-MW-1	6.63	259.8	25	1.0	228	2.78

Table 3-2: Groundwater Field Parameter Results

Sample Collection Date	Site ID	Sample #	pH	Conductivity (uS/cm)	Temperature (°C)	DO (mg/L)	Eh (rel mV)	Turbidity (NTU)
February 2012 Sampling								
24-Feb-12	TSF-MW-1	24022012GW001	6.52	34.2	27.3	1.5	112.5	3.33
25-Feb-12	MA-PZ1-TW1	25022012GW002	6.73	3.73	30	2.4	45.1	5.08
25-Feb-12	TSF-TW-7	25022012GW003	6.32	246.4	25.7	2.6	0.7	3.61
26-Feb-12	TSF-TW-2R	26022012GW004	5.31	46.4	25.5	NM	332.8	9.6
26-Feb-12	TSF-TW-2	26022012GW005	5.35	76.8	26.4	NM	180.5	5
26-Feb-12	TSF-TW-5	26022012GW006	6.26	NM	25.9	5.8	72.8	74.7
27-Feb-12	TSF-TW-3	27022012GW007	6.04	146.5	26	6.2	183.6	330
27-Feb-12	MA-TW-6	27022012GW008	7.58	400	25	1.3	305	6.85
28-Feb-12	M2-PZ1-TW1	28022012GW009	5.66	240.8	26.5	2.3	43.6	3.35
March 2012 Sampling								
27-Mar-12	TSF-TW-2	27032012GW001	5.34	6.3	26.2	1.6	45	2.51
27-Mar-12	TSF-TW-2R	27032012GW002	5.2	4.14	26.6	2.3	45.4	1.95
27-Mar-12	TSF-TW-7	27032012GW003	6.8	243.2	28.4	1.5	44.7	1.46
28-Mar-12	TSF-TW-3	28032012GW004	5.97	159.4	26	5.5	81.1	193
28-Mar-12	TSF-MW-1	28032012GW005	6.84	314	26.9	0.7	78	1.56
28-Mar-12	TSF-TW-5	28032012GW006	5.44	174.1	26.5	0.9	91.5	56.5
29-Mar-12	M2-PZ1-TW1	29032012GW007	6.67	463	25	0.9	50.3	5.38
29-Mar-12	MA-TW-6	29032012GW008	7.29	420	25	0.3	108.5	206
30-Mar-12	MA-PZ1-TW1	30032012GW009	6.78	414	29.6	0.7	30.5	0.75
26-Mar-12	NADD-1298	NADD1298GW001	7.15	374	26.4	2.6	110	
April 2012 Sampling								
24-Apr-12	TSF-TW-2	24042012GW001	5.23	60.9	27	1.9	267.7	1.03
24-Apr-12	TSF-TW-2R	24042012GW002	5.18	43.8	26.3	2.6	239.5	0.38
24-Apr-12	TSF-TW-7	24042012GW003	6.33	243	27	0.7	NM	0.69
25-Apr-12	TSF-MW-1	25042012GW004	6.74	340	27.6	0.4	166.7	0.59
25-Apr-12	TSF-TW-3	25042012GW005	5.81	159.2	26	1.7	NM	142
26-Feb-12	MA-TW-6	26042012GW006	7.29	417	27	0.3	NM	1.32
27-Apr-12	TSF-TW-5	27042012GW007	6.09	185.4	25.7	0.8	261.6	152
27-Apr-12	M2-PZ1-TW1	27042012GW008	7.01	449	26.1	0.4	137.8	3.46
28-Apr-12	MA-PZ1-TW1	28042012GW009	6.78	389	28.9	1.0	166	0.28

Table 3-2: Groundwater Field Parameter Results

Sample Collection Date	Site ID	Sample #	pH	Conductivity (uS/cm)	Temperature (°C)	DO (mg/L)	Eh (rel mV)	Turbidity (NTU)
May 2012 Sampling								
15-May-12	TSF-TW-7	15052012GW001	6.4	254.9	26.7	0.4	-51.3	37
16-May-12	TSF-TW-2	16052012GW002	5.26	60.8	25.8	1.4	260.6	1.87
16-May-12	TSF-TW-2R	16052012GW003	5.35	47.1	26.4	2.1	294.1	0.44
16-May-12	TSF-MW-1	16052012GW004	6.88	310	20.3	3.1	153.9	0.84
17-May-12	MA-TW-6	17052012GW005	7.49	456	27.7	0.3	109.7	1.03
18-May-12	TSF-TW-3	18052012GW006	6.31	152.5	26	0.6	175.7	107
18-May-12	TSF-TW-5	18052012GW007	6.26	182.7	27.3	0.9	-64.6	27.4
19-May-12	M2-PZ1-TW1	19052012GW008	7.16	468	25	0.3	99.7	0.5
19-May-12	MA-PZ1-TW1	19052012GW009	6.99	410	29.2	0.6	58.8	1.18

Notes:

NM: Not Measured

Table 3-4: Groundwater Quality - University Laboratory Analytical Results and Comparison to SVL Analytical Results

Sample Date	Sample ID	Site ID	mg/L TSS		Relative Percent Difference	mg/L TDS		Relative Percent Difference	Phosphate (PO ₄ ³⁻) (mg/L)		Phosphorus (P) (mg/L)	
			Univ. Lab	SVL		Univ. Lab	SVL		Filtered	Infiltered	Filtered	Infiltered
November/December 2011												
Dec 12-15, 2012	TSF-TW-5	TSF-TW-5	13	18	32%	192	138	33%	0.93	0.70	0.86	0.34
	MA-TW-6	MA-TW-6	23	24	4%	337	212	46%	0.66	0.56	0.24	0.22
	TSF-MW-1-SA (TSS + TDS)	TSF-MW-1	18	10	57%	236	114	70%	Not Analyzed			
	TSF-TW-3 (TSS + TDS)	TSF-TW-3	288	194	39%	512	254	67%	0.13	0.14	0.04	0.02
	MA-TW-1 (TSS + TDS)	MA-PZ1-TW1	0	10	200%	328	228	36%	0.65	0.65	0.34	0.38
	TSF-TW-3 (TSS + TDS)	TSF-TW-3	27	194	151%	497	254	65%	Not Analyzed			
	TSF-MW-1 (TSS + TDS)	TSF-MW-1	0	10	200%	132	114	15%	0.24	0.18	0.12	0.04
	M2-PZ1-TW1 (TSS + TDS)	M2-PZ1-TW1	58	64	10%	296	200	39%	0.40	0.43	0.30	0.27
	MA-PZ1-TW1 (TSS + TDS)	MA-PZ1-TW1	6	10	50%	325	228	35%	Not Analyzed			
	FIELD BLANK (TSS + TDS)	Field Blank	0	10	200%	55	20	93%	Not Analyzed			
	Field Blank	Field Blank	0	10	200%	11	20	58%	0.01	0.01	0.01	0.01
	Equipment Blank	Equipment Blank	0	10	200%	13	20	42%	0.01	0.02	0.01	0.00
TSF-TW-5-DUP	TSF-TW-5-DUP	10	20	67%	230	80	97%	0.97	1.10	0.76	0.92	
February 2012												
24-Feb-12	24FEB2012GW001	TSF-MW-1	3	18	143%	203	208	2%	Not Analyzed			
24-Feb-12	24FEB2012GW001	TSF-MW-1	1	18	179%	249	208	18%				
25-Feb-12	25FEB2012GW002	MA-PZ1-TW1	4	14	111%	277	261	6%				
25-Feb-12	25FEB2012GW002	MA-PZ1-TW1	3	14	129%	312	261	18%				
25-Feb-12	25FEB2012GW003	TSF-TW7	8	10	22%	200	185	8%				
25-Feb-12	25FEB2012GW003	TSF-TW7	5	10	67%	254	185	31%				
26-Feb-12	26FEB2012GW004	TSF-TW-2R	1	5	133%	51	32	46%				
26-Feb-12	26FEB2012GW004	TSF-TW-2R	2	5	86%	47	32	38%				
26-Feb-12	26FEB2012GW005	TSF-TW-2	3	5	50%	107	66	47%				
26-Feb-12	26FEB2012GW005	TSF-TW-2	2	5	86%	121	66	59%				
26-Feb-12	26FEB2012GW006	TSF-TW-5	3	106	189%	176	156	12%				
26-Feb-12	26FEB2012GW006	TSF-TW-5	6	106	179%	229	156	38%				
27-Feb-12	27FEB2012GW007	TSF-TW-3	390	420	7%	410	140	98%				
27-Feb-12	27FEB2012GW007	TSF-TW-3	320	420	27%	413	140	99%				
27-Feb-12	27FEB2012GW008	MA-TW-6	14	15	7%	290	266	9%				
27-Feb-12	27FEB2012GW008	MA-TW-6	15	15	0%	389	266	38%				
28-Feb-12	28FEB2012GW009	M2-PZ1-TW1	166	45	115%	246	255	4%				
28-Feb-12	28FEB2012GW009	M2-PZ1-TW1	160	45	112%	252	255	1%				
28-Feb-12	28FEB2012GW109	Dup	99	43	79%	242	251	4%				
28-Feb-12	28FEB2012GW109	Dup	65	43	41%	241	251	4%				

Table 3-4: Groundwater Quality - University Laboratory Analytical Results and Comparison to SVL Analytical Results

Sample Date	Sample ID	Site ID	mg/L TSS		Relative Percent Difference	mg/L TDS		Relative Percent Difference	Phosphate (PO ₄ ³⁻) (mg/L)		Phosphorus (P) (mg/L)	
			Univ. Lab	SVL		Univ. Lab	SVL		Filtered	Infiltered	Filtered	Infiltered
March 2012												
27-Mar-12	27MAR2012GW001	TSF-TW-2	5	5	0%	123	78	45%	Not Analyzed			
27-Mar-12	27MAR2012GW001	TSF-TW-2	7	5	33%	126	78	47%				
27-Mar-12	27MAR2012GW002	TSF-TW-2R	6	5	18%	60	42	35%				
27-Mar-12	27MAR2012GW002	TSF-TW-2R	5	5	0%	62	42	38%				
27-Mar-12	27MAR2012GW003	TSF-TW-7	5	9	57%	254	181	34%				
27-Mar-12	27MAR2012GW003	TSF-TW-7	6	9	40%	251	181	32%				
28-Mar-12	28MAR2012GW004	TSF-TW-3	160	6.6	184%	980	252	118%				
28-Mar-12	28MAR2012GW004	TSF-TW-3	180	6.6	186%	1020	252	121%				
28-Mar-12	28MAR2012GW005	TSF-MW-1	1	5	133%	228	198	14%				
28-Mar-12	28MAR2012GW005	TSF-MW-1	1	5	133%	228	198	14%				
28-Mar-12	28MAR2012GW006	TSF-TW-5	67	255	117%	192	155	21%				
28-Mar-12	28MAR2012GW006	TSF-TW-5	90	255	96%	193	155	22%				
29-Mar-12	29MAR2012GW007	M2-PZ1-TW1	0	6	200%	315	260	19%				
29-Mar-12	29MAR2012GW007	M2-PZ1-TW1	0	6	200%	298	260	14%				
29-Mar-12	29MAR2012GW107	M2-PZ1-TW1 DUP	1	6	143%	299	268	11%				
29-Mar-12	29MAR2012GW107	M2-PZ1-TW1 DUP	0	6	200%	298	268	11%				
29-Mar-12	29MAR2012GW008	MA-TW-6	0	5	200%	383	282	30%				
30-Mar-12	29MAR2012GW008	MA-TW-6	0	5	200%	389	282	32%				
30-Mar-12	30MAR2012GW009	MA-PZ1-TW1	0	5	200%	312	258	19%				
30-Mar-12	30MAR2012GW009	MA-PZ1-TW1	0	5	200%	329	258	24%				
April 2012												
24-Apr-12	24042012GW001	TSF-TW-2	0	5	200%	75	61	21%	Not Analyzed			
24-Apr-12	24042012GW001	TSF-TW-2	4	5	22%	74	61	19%				
24-Apr-12	24042012GW002	TSF-TW-2R	1	5	133%	41	34	19%				
24-Apr-12	24042012GW002	TSF-TW-2R	1	5	133%	35	34	3%				
24-Apr-12	24042012GW102	TSF-TW-2R DUP	0	5	200%	47	23	69%				
24-Apr-12	24042012GW102	TSF-TW-2R DUP	0	5	200%	45	23	65%				
24-Apr-12	24042012GW003	TSF-TW-7	3	6	67%	201	171	16%				
24-Apr-12	24042012GW003	TSF-TW-7	4	6	40%	192	171	12%				
25-Apr-12	25042012GW004	TSF-MW-1	4	5	22%	191	156	20%				
25-Apr-12	25042012GW004	TSF-MW-1	3	5	50%	206	156	28%				
25-Apr-12	25042012GW005	TSF-TW-3	170	264	43%	120	72	50%				
25-Apr-12	25042012GW005	TSF-TW-3	180	264	38%	120	72	50%				
26-Apr-12	26042012GW006	MA-TW-6	3	5	50%	264	223	17%				
26-Apr-12	26042012GW006	MA-TW-6	2	5	86%	273	223	20%				
27-Apr-12	27042012GW007	TSF-TW-5	270	714	90%	210	94	76%				
27-Apr-12	27042012GW007	TSF-TW-5	280	714	87%	190	94	68%				
27-Apr-12	27042012GW008	M2-PZ1-TW1	5	9	57%	323	211	42%				
27-Apr-12	27042012GW008	M2-PZ1-TW1	3	9	100%	325	211	43%				
28-Apr-12	28042012GW009	MA-PZ1-TW1	3	5	50%	319	216	39%				
28-Apr-12	28042012GW009	MA-PZ1-TW1	2	5	86%	314	216	37%				

Table 3-4: Groundwater Quality - University Laboratory Analytical Results and Comparison to SVL Analytical Results

Sample Date	Sample ID	Site ID	mg/L TSS		Relative Percent Difference	mg/L TDS		Relative Percent Difference	Phosphate (PO ₄ ³⁻) (mg/L)		Phosphorus (P) (mg/L)	
			Univ. Lab	SVL		Univ. Lab	SVL		Filtered	Infiltered	Filtered	Infiltered
May 2012												
15-May-12	15052012GW001	TSF-TW-7	7	5	33%	279	176	45%	Not Analyzed			
15-May-12	15052012GW001	TSF-TW-7	8	5	46%	283	176	47%				
15-May-12	15052012GW101	TSF-TW-7 DUP	1	5	133%	265	184	36%				
15-May-12	15052012GW101	TSF-TW-7 DUP	1	5	133%	258	184	33%				
16-May-12	16052012GW002	TSF-TW-2	1	5	133%	118	51	79%				
16-May-12	16052012GW002	TSF-TW-2	2	5	86%	115	51	77%				
16-May-12	16052012GW003	TSF-TW-2R	2	5	86%	67	66	2%				
16-May-12	16052012GW003	TSF-TW-2R	3	5	50%	63	66	5%				
16-May-12	16052012GW004	TSF-MW-1	6	5	18%	209	188	11%				
16-May-12	16052012GW004	TSF-MW-1	4	5	22%	203	188	8%				
17-May-12	17052012GW005	MA-TW-6	12	5	82%	286	276	4%				
17-May-12	17052012GW005	MA-TW-6	11	5	75%	291	276	5%				
18-May-12	18052012GW006	TSF-TW-3	270	340	23%	27	108	120%				
18-May-12	18052012GW006	TSF-TW-3	250	340	31%	30	108	113%				
18-May-12	18052012GW007	TSF-TW-5	100	107	7%	164	137	18%				
18-May-12	18052012GW007	TSF-TW-5	107	107	0%	168	137	20%				
19-May-12	19052012GW008	M2-PZ1-TW1	1	5	133%	309	275	12%				
19-May-12	19052012GW008	M2-PZ1-TW1	1	5	133%	305	275	10%				
19-May-12	19052012GW009	MA-PZ1-TW1	5	5	0%	280	264	6%				
19-May-12	19052012GW009	MA-PZ1-TW1	6	5	18%	286	264	8%				

Notes:

1. Bold indicates RPD greater than 20%.
2. Shading indicates that the concentration is below the reporting limit, therefore the concentration is set at reporting limit.
3. Filtered phosphate is soluble reactive phosphorus (SRP).
4. Filtered phosphorus is soluble unreactive phosphorus (SUP).
5. Unfiltered phosphorus is total phosphorus (TP).

Table 4-1: Sediment Analysis Results, Sieve Size #10 (< 2 mm)

Site ID	Aluminum	Arsenic	Cadmium	Chromium	Copper	Cyanide (free)	Cyanide (total)	Cyanide (WAD)	Iron	Lead	Manganese
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
SW-04A	1,440	1.64	< 0.1	8.95	2.26	< 1	< 0.5	< 0.5	4,185	1.04	12.90
SW-04A (Dup)	1,400	1.62	< 0.1	8.73	2.16	< 1	< 0.5	< 0.5	4,050	1.01	12.40
SW-04B	3,630	22.70	< 0.1	72.50	28.80	< 1	< 0.5	< 0.5	38,000	7.13	74.00
SW-13	613	12.60	< 0.1	6.07	1.54	1.1	< 0.5	< 0.5	4,700	0.39	4.74
SW-15	1,940	< 0.3	< 0.1	15.30	6.02	< 1	< 0.5	< 0.5	7,330	1.93	4.89
SW-21	3,700	3.53	< 0.1	31.70	11.40	1.1	< 0.5	< 0.5	14,900	2.75	14.30
SW-23	3,530	< 0.3	< 0.1	35.20	14.30	2.2	< 0.5	< 0.5	23,300	1.87	23.60
SW-26	2,060	< 0.3	< 0.1	22.90	15.00	< 1	< 0.5	< 0.5	17,600	2.94	35.80
SW-27	717	0.35	< 0.1	4.75	1.50	< 1	< 0.5	< 0.5	991	0.88	2.25
SW-28	167	< 0.3	< 0.1	0.75	< 1	< 1	< 0.5	< 0.5	276	< 0.1	0.42
SW-29	3,940	0.39	< 0.1	16.80	11.40	1.3	< 0.5	< 0.5	8,510	2.33	14.90
SW-30	882	0.37	< 0.1	5.01	1.28	< 1	< 0.5	< 0.5	1,060	1.18	11.20
SW-31	2,995	0.33	< 0.1	24.55	14.05	< 1	< 0.5	< 0.5	13,150	3.00	38.30
SW-31 (Dup)	2,900	0.32	< 0.1	24.50	13.90	< 1	< 0.5	< 0.5	13,100	2.64	37.50
SW-32	1,920	< 0.3	< 0.1	21.00	14.40	< 1	< 0.5	< 0.5	16,000	2.95	31.70
SW-34	4,950	0.79	< 0.1	24.40	3.18	< 1	< 0.5	< 0.5	9,160	3.41	8.31
SW-35	1,970	0.76	< 0.1	8.44	2.01	< 1	< 0.5	< 0.5	6,050	1.73	17.90
SW-37	439	0.47	< 0.1	2.03	< 1	< 1	< 0.5	< 0.5	1,900	0.39	21.70
SW-38	1,210	0.39	< 0.1	10.50	4.08	< 1	< 0.5	< 0.5	5,890	0.74	4.79

Table 4-1: Sediment Analysis Results, Sieve Size #10 (< 2 mm)

Site ID	Mercury	Nickel	Selenium	Silver	Thallium	Total Organic Carbon	Total Organic Matter	Vanadium	Zinc
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	%	mg/kg	mg/kg
SW-04A	0.11	1.62	< 0.3	< 0.05	< 0.1	0.14	0.24	5.38	2.34
SW-04A (Dup)	0.10	1.58	< 0.3	< 0.05	< 0.1	0.16	0.27	5.26	2.24
SW-04B	0.05	12.50	0.53	< 0.05	< 0.1	0.25	0.43	29.90	18.70
SW-13	0.05	1.09	< 0.3	< 0.05	< 0.1	< 0.09	< 0.15	3.54	1.29
SW-15	0.07	1.72	0.48	< 0.05	< 0.1	0.85	1.47	16.70	3.34
SW-21	0.15	3.63	0.84	< 0.05	< 0.1	0.67	1.15	22.60	6.05
SW-23	0.19	1.65	< 0.3	0.052	< 0.1	0.24	0.42	31.80	4.76
SW-26	0.38	2.61	< 0.3	< 0.05	< 0.1	0.19	0.32	20.70	7.38
SW-27	0.09	1.06	0.71	< 0.05	< 0.1	< 0.09	< 0.15	2.86	2.03
SW-28	< 0.033	< 1	< 0.3	< 0.05	< 0.1	0.31	0.54	0.98	< 1
SW-29	0.18	4.00	0.75	< 0.05	< 0.1	1.03	1.77	15.60	5.83
SW-30	< 0.033	1.13	< 0.3	< 0.05	< 0.1	0.29	0.49	2.27	1.70
SW-31	0.16	2.55	0.75	< 0.05	< 0.1	0.59	1.02	22.45	10.64
SW-31 (Dup)	0.15	2.45	0.72	< 0.05	< 0.1	0.48	0.83	22.30	6.27
SW-32	0.32	2.26	< 0.3	< 0.05	< 0.1	0.12	0.21	19.40	6.70
SW-34	0.10	1.85	0.54	< 0.05	< 0.1	0.66	1.13	19.20	4.02
SW-35	< 0.033	1.05	0.47	< 0.05	< 0.1	0.30	0.52	7.99	2.40
SW-37	0.99	< 1	< 0.3	< 0.05	< 0.1	0.35	0.60	1.75	1.53
SW-38	0.07	1.33	< 0.3	< 0.05	< 0.1	0.30	0.51	9.34	3.69

Table 4-2: Sediment Analysis Results, Sieve Size #230 (< 0.063 mm)

Site ID	Aluminum	Arsenic	Cadmium	Chromium	Copper	Cyanide (free)	Cyanide (total)	Cyanide (WAD)	Iron	Lead	Manganese
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
SW-04A	7,280	8.35	< 0.1	60.40	16.80	< 1	< 0.5	< 0.5	29,600	5.13	88.00
SW-04A (Dup)	7,150	7.71	< 0.1	60.90	16.50	< 1	< 0.5	< 0.5	29,600	4.89	88.20
SW-04B	4,520	15.90	< 0.1	69.10	23.10	< 1	< 0.5	< 0.5	36,200	5.37	67.90
SW-13	3,900	92.60	< 0.1	33.30	10.80	< 1	< 0.5	< 0.5	33,800	2.85	36.50
SW-15	4,330	< 0.3	< 0.1	31.70	11.40	< 1	< 0.5	< 0.5	14,400	3.82	9.34
SW-21	5,060	2.91	< 0.1	39.80	15.00	< 1	< 0.5	< 0.5	17,400	3.68	16.30
SW-23	4,120	< 0.3	< 0.1	44.20	21.30	< 1	< 0.5	< 0.5	29,500	2.21	29.10
SW-26	3,060	< 0.3	< 0.1	32.90	20.80	< 1	< 0.5	< 0.5	24,500	3.95	47.10
SW-27	2,500	1.55	< 0.1	17.70	6.50	< 1	< 0.5	< 0.5	4,680	3.44	11.90
SW-28	3,510	0.95	< 0.1	24.80	10.40	< 5	< 0.5	< 0.5	5,760	2.31	9.07
SW-29	5,000	0.45	< 0.1	23.00	14.50	< 1	< 0.5	< 0.5	11,500	2.80	18.70
SW-30	5,680	1.45	< 0.1	39.70	11.60	< 1	< 0.5	< 0.5	8,940	7.18	94.40
SW-31	4,245	< 0.3	< 0.1	38.25	22.40	< 1	< 0.5	< 0.5	20,350	3.18	47.65
SW-31 (Dup)	4,200	< 0.3	< 0.1	38.20	22.30	< 1	< 0.5	< 0.5	20,300	3.15	46.90
SW-32	3,050	< 0.3	< 0.1	34.50	21.50	< 1	< 0.5	< 0.5	25,500	4.61	47.80
SW-34	7,160	0.93	< 0.1	36.20	4.78	< 1	< 0.5	< 0.5	13,400	4.59	11.30
SW-35	4,370	1.04	< 0.1	18.70	5.04	< 1	< 0.5	< 0.5	12,600	5.31	36.40
SW-37	3,610	2.05	< 0.1	21.20	7.60	< 1	< 0.5	< 0.5	15,500	3.18	165.00
SW-38	5,720	1.02	< 0.1	34.80	9.77	< 1	< 0.5	< 0.5	18,300	4.44	23.20

Table 4-2: Sediment Analysis Results, Sieve Size #230 (< 0.063 mm)

Site ID	Mercury	Nickel	Selenium	Silver	Thallium	Total Organic Carbon	Total Organic Matter	Vanadium	Zinc
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	%	mg/kg	mg/kg
SW-04A	0.51	10.95	0.56	< 0.05	< 0.1	0.51	0.88	32.30	17.85
SW-04A (Dup)	0.51	10.90	0.52	< 0.05	< 0.1	0.53	0.91		
SW-04B	0.38	11.00	0.43	< 0.05	< 0.1	0.27	0.46	28.70	18.00
SW-13	0.28	5.88	0.75	< 0.05	< 0.1	0.77	1.33	23.10	7.91
SW-15	0.43	3.72	0.68	< 0.05	< 0.1	1.15	1.98	30.20	7.11
SW-21	0.15	4.84	1.14	< 0.05	< 0.1	0.65	1.13	29.80	8.42
SW-23	0.15	2.03	< 0.3	< 0.05	< 0.1	0.19	0.33	37.70	7.39
SW-26	0.17	3.02	< 0.3	< 0.05	< 0.1	0.13	0.22	28.80	10.10
SW-27	0.43	3.47	3.48	< 0.05	< 0.1	0.27	0.46	12.60	6.60
SW-28	0.19	13.50	0.66	< 0.05	< 0.1	6.34	10.90	10.40	7.67
SW-29	0.19	5.69	0.94	< 0.05	< 0.1	0.83	1.43	19.80	8.08
SW-30	0.15	8.92	0.91	< 0.05	< 0.1	2.49	4.29	16.90	14.50
SW-31	0.16	3.78	0.70	< 0.05	< 0.1	0.32	0.56	33.20	10.10
SW-31 (Dup)	0.16	3.77	0.71	< 0.05	< 0.1	0.30	0.52	33.00	9.89
SW-32	0.17	2.62	< 0.3	< 0.05	< 0.1	0.16	0.27	31.00	10.20
SW-34	0.10	3.19	0.72	< 0.05	< 0.1	0.78	1.34	28.00	6.32
SW-35	0.14	2.23	0.86	< 0.05	< 0.1	0.64	1.10	16.90	9.36
SW-37	0.17	6.81	0.88	< 0.05	< 0.1	1.99	3.43	13.70	13.60
SW-38	0.16	4.12	0.65	< 0.05	< 0.1	0.98	1.68	28.00	11.80

Table 5-1: Sample Data Validation Summary

Sample Number	Site ID	Date	Assessment of Completeness	Assessment of Holding Times	Field Duplicate Sample Evaluation	Charge Balance Errors	Blank samples	Laboratory vs. Field Analyses	Comparison of Total and Dissolved	Inter-Laboratory Comparison
10272011GW001	TSF-TW-3	October groundwater samples	●	○	NA	●	NA	○	●	X
10282011GW001	TSF-TW-2		●	○	NA	●	NA	○	●	X
10292011GW001	M2-PZ1-TW1		●	○	NA	●	NA	●	●	X
10302011GW001	TSF-MW-1		●	○	NA	●	NA	●	●	X
10302011GW002	TSF-TW-7		●	○	NA	●	NA	●	●	X
10302011GW003	MA-PZ1-TW1		●	○	NA	●	NA	●	○	X
10312011GW001	TSF-TW-5		●	○	NA	●	NA	●	○	X
10312011SW001	SW-04B		●	○	NA	NA	NA	NA	NA	X
11212011SW011	Unnamed Merian Cree	November surface water samples	●	○	NA	●	NA	●	●	X
11212011SW012	Unnamed Merian Cree		●	○	NA	●	NA	●	●	X
11212011SW013	Unnamed Merian Cree		●	○	NA	●	NA	○	●	X
11222011SW015	Tempati Creek		●	○	NA	●	NA	○	●	X
11242011SW017	Las Dominicanas Cree		●	○	NA	○	NA	○	●	X
11242011SW018	Merian Creek		●	○	NA	●	NA	●	●	X
11242011SW019	Unnamed Merian Cree		●	○	○	●	NA	●	●	X
11242011SW119	0		●	○	○	●	NA	●	●	X
11252011SW020	Offsite Merian Creek		●	○	○	●	NA	●	●	X
11252011SW120	0		●	○	○	●	NA	○	●	X
11262011SW021	Las Dominicanas Cree		●	○	NA	●	NA	●	●	X
11262011SW221	0		●	○	NA	●	○	●	○	X
11262011SW022	0		●	○	NA	NA	NA	NA	NA	NA
11262011SW023	0		●	○	NA	NA	NA	NA	NA	NA
11262011SW024	0	●	○	NA	NA	●	NA	NA	NA	
11012011-GW-001	TSF TW-2R	November groundwater samples	●	○	NA	●	NA	●,X	●	X
11192011GW001	TSF-TW-7		●	○	NA	●	NA	●	●	X
11192011GW002	TSF-TW-2R		●	○	NA	●	NA	●	●	X
11162011SW001	SW-35	November surface water samples	●	○	NA	●	NA	●	●	X
11162011SW002	SW-37		●	○	NA	●	NA	●	●	X
11162011SW003	SW-38		●	○	NA	●	NA	●	●	X
11182011SW004	SW-04B		●	○	NA	●	NA	○	●	X
11192011SW005	SW-04B		●	○	NA	●	NA	●	●	X
11202011SW006	SW-15		●	○	NA	●	NA	●	●	X
11202011SW007	SW-26		●	○	NA	●	NA	○	●	X
11202011SW008	SW-32		●	○	NA	●	NA	○	●	X
11152011SW009	SW-04B		●	○	NA	●	NA	●	●	X
11152011SW010	SW-37		●	○	NA	●	NA	●	●	X

Table 5-1: Sample Data Validation Summary

Sample Number	Site ID	Date	Assessment of Completeness	Assessment of Holding Times	Field Duplicate Sample Evaluation	Charge Balance Errors	Blank samples	Laboratory vs. Field Analyses	Comparison of Total and Dissolved	Inter-Laboratory Comparison
11162011SD001	SW-35	November sediment samples	●	○	NA	NA	NA	NA	NA	NA
11162011SD002	SW-37		●	○	NA	NA	NA	NA	NA	NA
11162011SD003	SW-38		●	○	NA	NA	NA	NA	NA	NA
11162011SD004	SW-04B		●	○	NA	NA	NA	NA	NA	NA
11202011SD006	SW-15		●	○	NA	NA	NA	NA	NA	NA
11202011SD007	SW-26		●	○	NA	NA	NA	NA	NA	NA
11202011SD008	SW-32		●	○	NA	NA	NA	NA	NA	NA
11212011SD011	SW-23		●	○	NA	NA	NA	NA	NA	X
11212011SD012	SW-13		●	○	NA	NA	NA	NA	NA	X
11212011SD013	SW-21		●	○	NA	NA	NA	NA	NA	X
11222011SD015	SW 29		●	○	NA	NA	NA	NA	NA	X
11242011SD017	SW-27		●	○	NA	NA	NA	NA	NA	X
11242011SD018	SW-34		●	○	NA	NA	NA	NA	NA	X
11242011SD019	SW-31		●	○	●	NA	NA	NA	NA	X
11242011SD119	SW-31		●	○	●	NA	NA	NA	NA	X
11252011SD020	SW-04A		●	○	●	NA	NA	NA	NA	X
11252011SD120	SW-04A		●	○	●	NA	NA	NA	NA	X
11262011SD021	SW-30	●	○	NA	NA	NA	NA	NA	X	
12162011SW025	SW-28	December surface water samples	●	○	NA	●	NA	●	●	X
12172011SW026	SW-04B		●	○	NA	NA	NA	NA	NA	X
12172011SW027	SW-35		●	○	NA	NA	NA	NA	NA	X
12172011SW028	SW-37		●	○	NA	NA	NA	NA	NA	X
12162011SD025	SW-28	December sediment samples	●	●	NA	NA	NA	NA	NA	X
M2-PZ1-TW	M2-PZ1-TW	December groundwater samples	○	○	NA	●	NA	○	●	NA
MA-PZ1-TW1-R	MA-PZ1-TW1-R		○	○	NA	●	NA	●	●	●
MA-PZ6-TW	MA-PZ6-TW		○	○	NA	●	NA	○	●	●
TSF-MW-1	TSF-MW-1		○	○	NA	●	NA	○	○	●
TSF-PZ5	TSF-PZ5		○	○	NA	●	NA	●	●	●
TSF-PZ-8-E	TSF-PZ-8-E		○	○	NA	○	NA	●	●	●
TSF-PZ-8-F	TSF-PZ-8-F		○	○	NA	○	NA	●	●	●
TSF-TW-3	TSF-TW-3		○	○	NA	●	NA	●	●	○
TSF-TW-5-DUP	TSF-TW-5-DUP	○	○	NA	●	NA	○	●	NA	

Table 5-1: Sample Data Validation Summary

Sample Number	Site ID	Date	Assessment of Completeness	Assessment of Holding Times	Field Duplicate Sample Evaluation	Charge Balance Errors	Blank samples	Laboratory vs. Field Analyses	Comparison of Total and Dissolved	Inter-Laboratory Comparison
DUP-100	DUP-100	January groundwater samples - limited analyses	●	○	○	NA	NA	NA	NA	X
M2-PZ-1-TW	M2-PZ-1-TW		●	○	NA	NA	NA	NA	NA	X
MA-PZ-1-TW	MA-PZ-1-TW		●	○	NA	NA	NA	NA	NA	X
MA-TW-6	MA-TW-6		●	○	NA	NA	NA	NA	NA	X
TSF-MW-1	TSF-MW-1		●	○	NA	NA	NA	NA	NA	X
TSF-PZ-2	TSF-PZ-2		●	○	NA	NA	NA	NA	NA	X
TSF-PZ-7	TSF-PZ-7		●	○	NA	NA	NA	NA	NA	X
TSF-TW-2R	TSF-TW-2R		●	○	○	NA	NA	NA	NA	X
TSF-TW-3	TSF-TW-3		●	○	NA	NA	NA	NA	NA	X
TSF-TW-5	TSF-TW-5		●	○	NA	NA	NA	NA	NA	X
DUP-100	DUP-100	January groundwater samples - extended analyses	●	○	○	●	NA	○	●	X
M2-PZ-1-TW	M2-PZ-1-TW		●	○	NA	●	NA	○	●	X
MA-PZ-1-TW	MA-PZ-1-TW		●	○	NA	●	NA	○	●	X
MA-TW-6	MA-TW-6		●	○	NA	●	NA	○	●	X
TSF-MW-1	TSF-MW-1		●	○	NA	●	NA	○	●	X
TSF-PZ-2	TSF-PZ-2		●	○	NA	●	NA	○	●	X
TSF-PZ-7	TSF-PZ-7		●	○	NA	●	NA	○	●	X
TSF-TW-2R	TSF-TW-2R		●	○	○	●	NA	○	●	X
TSF-TW-3	TSF-TW-3		●	○	NA	●	NA	○	●	X
TSF-TW-5	TSF-TW-5		●	○	NA	●	NA	○	●	X
24FEB12GW001	TSF-MW-1	February groundwater samples	●	○	NA	●	NA	○	●	X
25FEB12GW002	MA-PZ-1-TW		●	○	NA	●	NA	○	●	X
25FEB12GW003	TSF-PZ-7		●	○	NA	●	NA	●	●	X
26FEB12GW004	TSF-TW-2R		●	○	NA	●	NA	○	●	X
26FEB12GW005	TSF-TW-2		●	○	NA	●	NA	●	●	X
26FEB12GW006	TSF-TW-5		●	○	NA	●	NA	●	●	X
27FEB12GW007	TSF-TW-3		●	●	NA	●	NA	●	○	X
27FEB12GW008	MA-TW-6		●	●	NA	●	NA	●	●	X
28FEB12GW009	M2-PZ-1-TW		●	●	●	●	NA	○	○	X
28FEB12GW109	M2-PZ-1-TW		●	●	●	●	NA	○	●	X
02MAR2012SW001	SW-21	March surface water samples	●	○	NA	●	NA	○	●	X
02MAR2012SW002	SW-13		●	○	NA	○	NA	○	●	X
02MAR2012SW003	SW-26		●	○	NA	○	NA	○	●	X
02MAR2012SW004	SW-32		●	○	NA	○	NA	○	●	X
03MAR2012SW005	SW-15		●	○	NA	○	NA	○	●	X
03MAR2012SW006	SW-23		●	○	NA	○	NA	○	●	X

Table 5-1: Sample Data Validation Summary

Sample Number	Site ID	Date	Assessment of Completeness	Assessment of Holding Times	Field Duplicate Sample Evaluation	Charge Balance Errors	Blank samples	Laboratory vs. Field Analyses	Comparison of Total and Dissolved	Inter-Laboratory Comparison
03MAR2012SW005	SW-23	March surface water samples	●	○	NA	○	NA	○	●	X
04MAR2012SW007	SW-28		●	○	NA	○	NA	○	●	X
04MAR2012SW008	SW-30		●	○	NA	●	NA	○	●	X
04MAR2012SW009	SW-38		●	○	NA	○	NA	○	●	X
04MAR2012SW010	SW-35		●	○	NA	○	NA	○	●	X
04MAR2012SW011	SW-37		●	○	NA	○	NA	○	●	X
05MAR2012SW012	SW-31		●	○	NA	●	NA	○	●	X
05MAR2012SW013	SW-4B		●	○	○	○	NA	○	●	X
05MAR2012SW014	SW-34		●	○	NA	○	NA	○	●	X
05MAR2012SW015	SW-04A		●	○	NA	○	NA	○	●	X
05MAR2012SW113	SW-4B		●	○	○	●	NA	○	●	X
05MAR2012SW201	Blank		●	○	NA	NA	○	NA	●	X
27MAR12GW001	TSF-TW-2		March groundwater samples	○	○	NA	●	NA	○	●
27MAR12GW002	TSF-TW-2R	○		○	NA	●	NA	○	●	X
27MAR12GW003	TSF-TW-7	○		○	NA	●	NA	●	●	X
28MAR12GW004	TSF-TW-3	○		○	NA	●	NA	●	●	X
28MAR12GW005	TSF-MW-1	○		○	NA	●	NA	●	●	X
28MAR12GW006	TSF-TW-5	○		○	NA	●	NA	●	●	X
29MAR12GW007	M2-PZ1-TW1	○		○	○	●	NA	●	●	X
29MAR12GW008	MA-TW-6	○		○	NA	●	NA	●	●	X
29MAR12GW107	M2-PZ1-TW1	○		○	○	●	NA	●	●	X
30MAR12GW009	MA-PZ1-TW1	○		○	NA	●	NA	●	●	X
NADD1298GW001	NADD-1298	○		○	NA	●	NA	●	●	X
24APR12GW001	TSF-TW-2	April groundwater samples	●	○	NA	●	NA	●	●	X
24APR12GW002	TSF-TW-2R		●	○	○	●	NA	●	●	X
24APR12GW102	TSF-TW-2R		●	○	○	●	NA	●	●	X
24APR12GW003	TSF-TW-7		●	○	NA	●	NA	○	●	X
25APR12GW004	TSF-MW-1		●	○	NA	●	NA	○	●	X
25APR12GW005	TSF-TW-3		●	○	NA	●	NA	○	●	X
26APR12GW006	MA-TW-6		●	○	NA	●	NA	○	○	X
27APR12GW007	TSF-TW-5		●	○	NA	●	NA	○	●	X
27APR12GW008	M2-PZ1-TW1		●	○	NA	●	NA	○	●	X
28APR12GW009	MA-PZ1-TW1		●	○	NA	●	NA	○	●	X
15MAY12GW001	TSF-TW-7	May groundwater samples	●	○	○	●	NA	●	●	X
15MAY12GW101	TSF-TW-7		●	○	○	●	NA	●	●	X
16MAY12GW002	TSF-TW-2		●	○	NA	●	NA	●	●	X
16MAY12GW003	TSF-TW-2R		●	○	NA	●	NA	○	●	X
16MAY12GW004	TSF-MW-1		●	○	NA	●	NA	●	●	X
17MAY12GW005	MA-TW-6		●	○	NA	●	NA	●	●	X
18MAY12GW006	TSF-TW-3		●	○	NA	●	NA	●	●	X
18MAY12GW007	TSF-TW-5		●	○	NA	●	NA	●	●	X
19MAY12GW008	M2-PZ1-TW1		●	○	NA	●	NA	●	●	X
19MAY12GW009	MA-PZ1-TW1	●	○	NA	●	NA	●	●	X	

Note:
●: data OK, ○: minor issue, see note, X: could not evaluate, NA: not applicable

Table 6-1: Recommended Analytical Parameters for Future Water Quality Monitoring

Type	Constituent	Surface Water	Groundwater	Preservative	Holding Time	Laboratory	Method	Reporting Limit (mg/L)	Note
Field Measurement	pH	X	X	na	na	Field Parameter	Field Meter	Not Applicable	
	Conductivity	X	X	na	na	Field Parameter	Field Meter	Not Applicable	
	Dissolved Oxygen	X	X	na	na	Field Parameter	Field Meter	Not Applicable	
	Turbidity	X	X	na	na	Field Parameter	Field Meter	Not Applicable	
	Temperature	X	X	na	na	Field Parameter	Field Meter	Not Applicable	
	Eh	X	X	na	na	Field Parameter	Field Meter	Not Applicable	
	Chlorophyll	X	Not Analyzed	na	na	Field Parameter	YSI Field Meter	Not Applicable	
SVL Lab (other parameters)	pH	X	X	None	Immediate	SVL	SM 4500 H B	Not Applicable	Lab holding time will not be met
	Conductivity	X	X	None	24 Hours	SVL	EPA 120.1	Not Applicable	
	Turbidity	X	X	None	2 Days	SVL	EPA 180.1	Not Applicable	
	COD	X	Not Analyzed	H ₂ SO ₄	28 days	SVL	EPA 410.4	5.0	
	Total Organic Carbon	X	Not Analyzed	H ₂ SO ₄	28 days	SVL	5310B	1	
	CN-WAD	X	X	NaOH	14 days	SVL	4500CN-I	0.01	
	CN-Free	X	X	NaOH	14 days	SVL	ASTM D7237	0.005	
	CN-Total	X	X	NaOH	14 days	SVL	335.4	0.01	
Oil and Grease	X	Not Analyzed	H ₂ SO ₄	28 days	SVL	1664M	1.0		
SVL Lab (conventionals)	Phosphorous - T	X	X	H ₂ SO ₄	28 days	SVL	365.2	0.01	
	Ammonia as N	X	X	H ₂ SO ₄	28 days	SVL	350.1	0.03	dependant on pH, temp, and species present
	Nitrate+Nitrite	X	X	H ₂ SO ₄	28 days	SVL	353.2	0.05	
	Hardness	X	X	HNO ₃	28 days	SVL	200.7 calc	Not Applicable	Calculated from Ca and Mn
	Sulfate	X	X	None	28 days	SVL	300	0.3	
	Chloride	X	X	None	28 days	SVL	300	0.2	
	Fluoride	X	X	None	28 days	SVL	300	0.1	
	Alkalinity (total)	X	X	None	14 days	SVL	2320B	1.0	
	Bicarbonate Alkalinity	X	X	None	14 days	SVL	2320B	1.0	
	Calcium (Ca)	X (total and dissolved)	X (total)	HNO ₃	6 months	SVL	200.7	0.04	
	Magnesium (Mg)	X (total and dissolved)	X (total)	HNO ₃	6 months	SVL	200.7	0.06	
	Sodium (Na)	X (total and dissolved)	X (total)	HNO ₃	6 months	SVL	200.7	0.5	
Potassium (K)	X (total and dissolved)	X (total)	HNO ₃	6 months	SVL	200.7	0.5		

Table 6-1: Recommended Analytical Parameters for Future Water Quality Monitoring

Type	Constituent	Surface Water	Groundwater	Preservative	Holding Time	Laboratory	Method	Reporting Limit (mg/L)	Note
SVL Lab (Metals)	Aluminum (Al)	X (total and dissolved)	X (total)	HNO ₃	6 months	SVL	200.7	0.080	
	Antimony (Sb)	X (total and dissolved)	X (total)	HNO ₃	6 months	SVL	200.8	0.003	
	Arsenic (As)	X (total and dissolved)	X (total)	HNO ₃	6 months	SVL	200.8	0.003	
	Barium (Ba)	X (total and dissolved)	X (total)	HNO ₃	6 months	SVL	200.7	0.002	
	Beryllium (Be)	X (total and dissolved)	X (total)	HNO ₃	6 months	SVL	200.8	0.0002	
	Boron (B)	X (total and dissolved)	X (total)	HNO ₃	6 months	SVL	200.7	0.040	
	Cadmium (Cd)	X (total and dissolved)	X (total)	HNO ₃	6 months	SVL	200.8	0.0002	
	Chromium (Cr)	X (total and dissolved)	X (total)	HNO ₃	6 months	SVL	200.7	0.006	
	Cobalt (Co)	X (total and dissolved)	X (total)	HNO ₃	6 months	SVL	200.7	0.006	
	Copper (Cu)	X (total and dissolved)	X (total)	HNO ₃	6 months	SVL	200.8	0.001	
	Iron (Fe)	X (total and dissolved)	X (total)	HNO ₃	6 months	SVL	200.7	0.060	
	Lead (Pb)	X (total and dissolved)	X (total)	HNO ₃	6 months	SVL	200.8	0.003	
	Manganese (Mn)	X (total and dissolved)	X (total)	HNO ₃	6 months	SVL	200.7	0.004	
	Mercury (Hg)	X	X	HNO ₃	28 days	SVL	245.1	0.0002	
	Molybdenum (Mo)	X (total and dissolved)	X (total)	HNO ₃	6 months	SVL	200.7	0.008	
	Nickel (Ni)	X(total and dissolved)	X(total)	HNO ₃	6 months	SVL	200.7	0.010	
	Selenium (Se)	X (total and dissolved)	X (total)	HNO ₃	6 months	SVL	200.8	0.003	
	Silicon (Si)	X (total and dissolved)	X (total)	HNO ₃	6 months	SVL	200.7	0.080	
	Silver (Ag)	X (total and dissolved)	X (total)	HNO ₃	6 months	SVL	200.8	0.0001	
	Thallium (Tl)	X (total and dissolved)	X (total)	HNO ₃	6 months	SVL	200.8	0.001	
Titanium (Ti)	X (total and dissolved)	X (total)	HNO ₃	6 months	SVL	200.7	0.005		
Uranium (u)	X	X	HNO ₃	6 months	SVL	200.8	0.001		
Vanadium (V)	X (total and dissolved)	X (total)	HNO ₃	6 months	SVL	200.7	0.005		
Zinc (Zn)	X (total and dissolved)	X (total)	HNO ₃	6 months	SVL	200.7	0.010		







Notes:

1. All samples to be kept at 4 degrees C.
2. Dissolved samples are field filtered with 0.45mm filter
3. SVL is SVL Analytical lab in Moscow, ID.

FIGURES

Water Quality Monitoring Locations

Legend

-  Monitoring Well
-  Surface Water Quality Station
-  Streams
-  TSF
-  Waste Rock Dumps
-  Pit Area

SOURCE DATA:
Golder Associates; Surgold



Project:

MERIAN

Sub-Project:

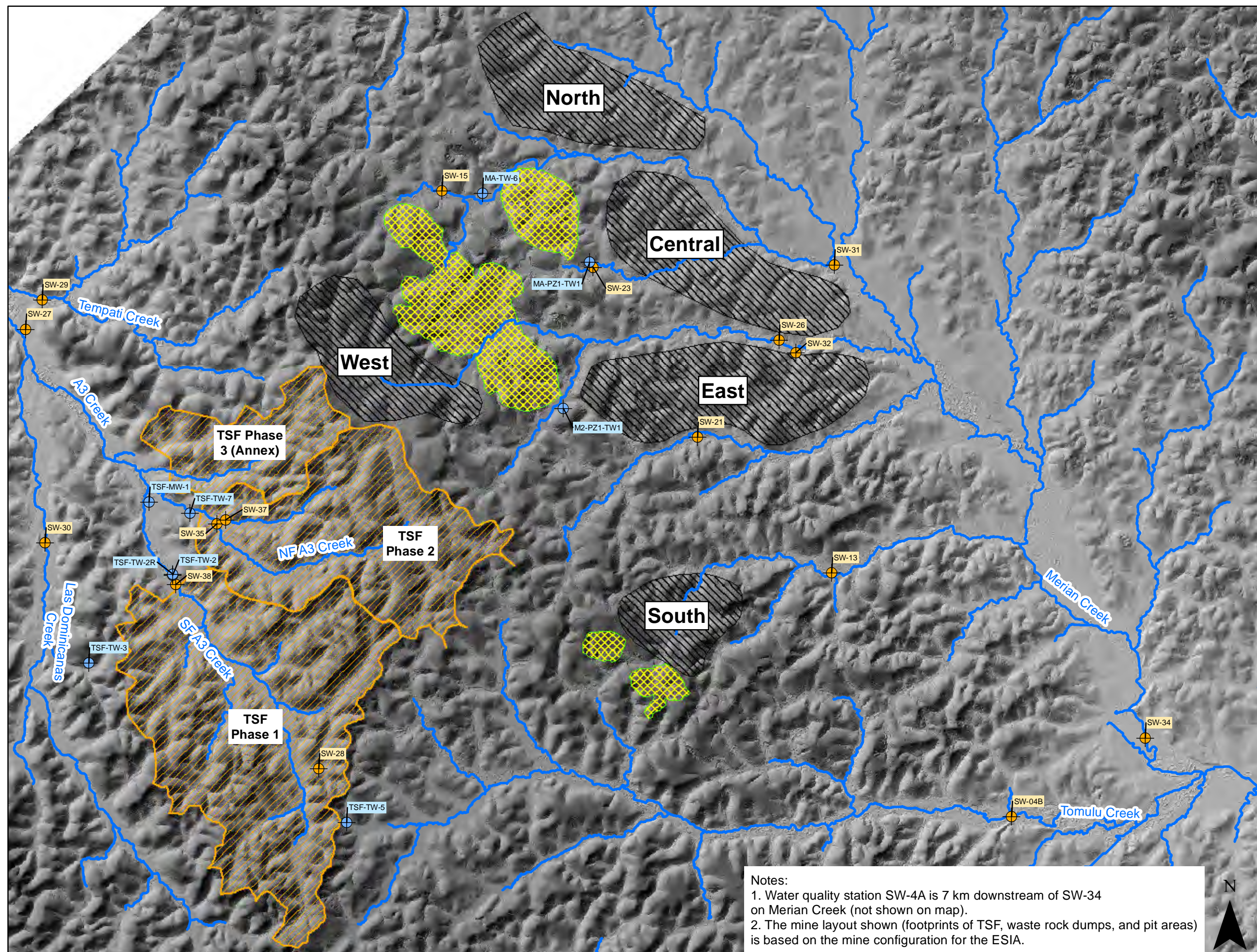
2012 Water Quality
Summary Report

Date: July 2012

Created By: JHP

Coordinate System:
WGS84_UTM_Zone_21N

Figure 2-1



Notes:
1. Water quality station SW-4A is 7 km downstream of SW-34 on Merian Creek (not shown on map).
2. The mine layout shown (footprints of TSF, waste rock dumps, and pit areas) is based on the mine configuration for the ESIA.



11393245500F01R01

APPENDIX A
RAW DATA REPORTS FROM ANALYTICAL LABORATORIES

SURFACE WATER

Anatek Labs, Inc.

1282 Alturas Drive • Moscow, ID 83843 • (208) 883-2839 • Fax (208) 882-9246 • email moscow@anateklabs.com
504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

Client: GOLDER ASSOCIATES
Address: 18300 NE UNION HILL RD. STE. 200
REDMOND, WA 98052
Attn: DEREK HOLOM

Batch #: 111201025
Project Name: SVL #W1K0622

Analytical Results Report

Sample Number	111201025-001	Sampling Date	11/21/2011	Date/Time Received	12/1/2011 12:10 PM
Client Sample ID	11212011SW011	Sampling Time	2:00 PM	Extraction Date	12/02/2011
Matrix	Water	Sample Location	W1K0622-01		
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Hexane extractable material (HEM)	ND	mg/L	1	12/2/2011	KFG	EPA 1664A	

Sample Number	111201025-002	Sampling Date	11/21/2011	Date/Time Received	12/1/2011 12:10 PM
Client Sample ID	11212011SW012	Sampling Time	3:00 PM	Extraction Date	12/02/2011
Matrix	Water	Sample Location	W1K0622-02		
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Hexane extractable material (HEM)	ND	mg/L	1	12/2/2011	KFG	EPA 1664A	

Sample Number	111201025-003	Sampling Date	11/21/2011	Date/Time Received	12/1/2011 12:10 PM
Client Sample ID	11212011SW013	Sampling Time	3:30 PM	Extraction Date	12/02/2011
Matrix	Water	Sample Location	W1K0622-03		
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Hexane extractable material (HEM)	ND	mg/L	1	12/2/2011	KFG	EPA 1664A	

Anatek Labs, Inc.

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Client: GOLDER ASSOCIATES
Address: 18300 NE UNION HILL RD. STE. 200
REDMOND, WA 98052
Attn: DEREK HOLOM

Batch #: 111201025
Project Name: SVL #W1K0622

Analytical Results Report

Sample Number	111201025-004	Sampling Date	11/24/2011	Date/Time Received	12/1/2011 12:10 PM
Client Sample ID	11242011SW017	Sampling Time	11:35 AM	Extraction Date	12/02/2011
Matrix	Water	Sample Location	W1K0622-05		
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Hexane extractable material (HEM)	ND	mg/L	1	12/2/2011	KFG	EPA 1664A	

Sample Number	111201025-005	Sampling Date	11/24/2011	Date/Time Received	12/1/2011 12:10 PM
Client Sample ID	11242011SW019	Sampling Time	3:15 PM	Extraction Date	12/02/2011
Matrix	Water	Sample Location	W1K0622-07		
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Hexane extractable material (HEM)	ND	mg/L	1	12/2/2011	KFG	EPA 1664A	

Sample Number	111201025-006	Sampling Date	11/24/2011	Date/Time Received	12/1/2011 12:10 PM
Client Sample ID	11242011SW119	Sampling Time	3:15 PM	Extraction Date	12/02/2011
Matrix	Water	Sample Location	W1K0622-08		
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Hexane extractable material (HEM)	ND	mg/L	1	12/2/2011	KFG	EPA 1664A	

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Client: GOLDER ASSOCIATES
Address: 18300 NE UNION HILL RD. STE. 200
REDMOND, WA 98052
Attn: DEREK HOLOM

Batch #: 111201025
Project Name: SVL #W1K0622

Analytical Results Report

Sample Number	111201025-007	Sampling Date	11/25/2011	Date/Time Received	12/1/2011 12:10 PM
Client Sample ID	11252011SW020	Sampling Time	9:30 AM	Extraction Date	12/02/2011
Matrix	Water	Sample Location	W1K0622-09		
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Hexane extractable material (HEM)	ND	mg/L	1	12/2/2011	KFG	EPA 1664A	

Sample Number	111201025-008	Sampling Date	11/25/2011	Date/Time Received	12/1/2011 12:10 PM
Client Sample ID	11252011SW120	Sampling Time	9:30 AM	Extraction Date	12/02/2011
Matrix	Water	Sample Location	W1K0622-10		
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Hexane extractable material (HEM)	ND	mg/L	1	12/2/2011	KFG	EPA 1664A	

Sample Number	111201025-009	Sampling Date	11/26/2011	Date/Time Received	12/1/2011 12:10 PM
Client Sample ID	11262011SW021	Sampling Time	10:45 AM	Extraction Date	12/02/2011
Matrix	Water	Sample Location	W1K0622-11		
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Hexane extractable material (HEM)	ND	mg/L	1	12/2/2011	KFG	EPA 1664A	

Anatek Labs, Inc.

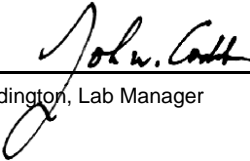
1282 Alturas Drive • Moscow, ID 83843 • (208) 883-2839 • Fax (208) 882-9246 • email moscow@anateklabs.com
504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

Client: GOLDER ASSOCIATES **Batch #:** 111201025
Address: 18300 NE UNION HILL RD. STE. 200 **Project Name:** SVL #W1K0622
REDMOND, WA 98052
Attn: DEREK HOLOM

Analytical Results Report

Sample Number	111201025-010	Sampling Date	11/26/2011	Date/Time Received	12/1/2011 12:10 PM		
Client Sample ID	11262011SW221	Sampling Time	11:00 AM	Extraction Date	12/02/2011		
Matrix	Water	Sample Location	W1K0622-12				
Comments							
Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Hexane extractable material (HEM)	ND	mg/L	1	12/2/2011	KFG	EPA 1664A	

Authorized Signature



John Coddington, Lab Manager

MCL EPA's Maximum Contaminant Level
ND Not Detected
PQL Practical Quantitation Limit

This report shall not be reproduced except in full, without the written approval of the laboratory.
The results reported relate only to the samples indicated.
Soil/solid results are reported on a dry-weight basis unless otherwise noted.

Anatek Labs, Inc.

1282 Alturas Drive • Moscow, ID 83843 • (208) 883-2839 • Fax (208) 882-9246 • email moscow@anateklabs.com
504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

Client: GOLDER ASSOCIATES
Address: 18300 NE UNION HILL RD. STE. 200
REDMOND, WA 98052
Attn: DEREK HOLOM

Batch #: 111201025
Project Name: SVL #W1K0622

Analytical Results Report Quality Control Data

Lab Control Sample

Parameter	LCS Result	Units	LCS Spike	%Rec	AR %Rec	Prep Date	Analysis Date
Hexane extractable material (HEM)	43.4	mg/L	40	108.5	79-114	12/1/2011	12/1/2011

Matrix Spike

Sample Number	Parameter	Sample Result	MS Result	Units	MS Spike	%Rec	AR %Rec	Prep Date	Analysis Date
111201022-001	Hexane extractable material (HEM)	ND	42.5	mg/L	40	106.3	79-114	12/1/2011	12/1/2011

Matrix Spike Duplicate

Parameter	MSD Result	Units	MSD Spike	%Rec	%RPD	AR %RPD	Prep Date	Analysis Date
Hexane extractable material (HEM)	44.0	mg/L	40	110.0	3.5	0-18	12/1/2011	12/1/2011

Method Blank

Parameter	Result	Units	PQL	Prep Date	Analysis Date
Hexane extractable material (HEM)	ND	mg/L	1	12/1/2011	12/1/2011

AR Acceptable Range
ND Not Detected
PQL Practical Quantitation Limit
RPD Relative Percentage Difference

Comments:

Certifications held by Anatek Labs ID: EPA:ID00013; AZ:0701; CO:ID00013; FL(NELAP):E87893; ID:ID00013; IN:C-ID-01; KY:90142; MT:CERT0028; NM: ID00013; OR:ID200001-002; WA:C595
Certifications held by Anatek Labs WA: EPA:WA00169; CA:Cert2632; ID:WA00169; WA:C585; MT:Cert0095

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Login Report

Customer Name: GOLDER ASSOCIATES

Order ID: 111201025

18300 NE UNION HILL RD. STE. 200

Order Date: 12/1/2011

REDMOND WA 98052

Contact Name: DEREK HOLOM

Project Name: SVL #W1K0622

Comment:

Sample #: 111201025-001 **Customer Sample #:** 11212011SW011

Recv'd:

Collector:

Date Collected: 11/21/2011

Quantity: 1

Matrix: Water

Date Received: 12/1/2011 12:10:00 P

Comment:

Test	Lab	Method	Due Date	Priority
FOG - HEM	M	EPA 1664A	12/13/2011	<u>Normal (6-10 Days)</u>

Sample #: 111201025-002 **Customer Sample #:** 11212011SW012

Recv'd:

Collector:

Date Collected: 11/21/2011

Quantity: 1

Matrix: Water

Date Received: 12/1/2011 12:10:00 P

Comment:

Test	Lab	Method	Due Date	Priority
FOG - HEM	M	EPA 1664A	12/13/2011	<u>Normal (6-10 Days)</u>

Sample #: 111201025-003 **Customer Sample #:** 11212011SW013

Recv'd:

Collector:

Date Collected: 11/21/2011

Quantity: 1

Matrix: Water

Date Received: 12/1/2011 12:10:00 P

Comment:

Test	Lab	Method	Due Date	Priority
FOG - HEM	M	EPA 1664A	12/13/2011	<u>Normal (6-10 Days)</u>

Customer Name: GOLDER ASSOCIATES
18300 NE UNION HILL RD. STE. 200
REDMOND WA 98052

Order ID: 111201025
Order Date: 12/1/2011

Contact Name: DEREK HOLOM

Project Name: SVL #W1K0622

Comment:

Sample #: 111201025-004 **Customer Sample #:** 11242011SW017

Recv'd: **Collector:** **Date Collected:** 11/24/2011
Quantity: 1 **Matrix:** Water **Date Received:** 12/1/2011 12:10:00 P
Comment:

Test	Lab	Method	Due Date	Priority
FOG - HEM	M	EPA 1664A	12/13/2011	<u>Normal (6-10 Days)</u>

Sample #: 111201025-005 **Customer Sample #:** 11242011SW019

Recv'd: **Collector:** **Date Collected:** 11/24/2011
Quantity: 1 **Matrix:** Water **Date Received:** 12/1/2011 12:10:00 P
Comment:

Test	Lab	Method	Due Date	Priority
FOG - HEM	M	EPA 1664A	12/13/2011	<u>Normal (6-10 Days)</u>

Sample #: 111201025-006 **Customer Sample #:** 11242011SW119

Recv'd: **Collector:** **Date Collected:** 11/24/2011
Quantity: 1 **Matrix:** Water **Date Received:** 12/1/2011 12:10:00 P
Comment:

Test	Lab	Method	Due Date	Priority
FOG - HEM	M	EPA 1664A	12/13/2011	<u>Normal (6-10 Days)</u>

Sample #: 111201025-007 **Customer Sample #:** 11252011SW020

Recv'd: **Collector:** **Date Collected:** 11/25/2011
Quantity: 1 **Matrix:** Water **Date Received:** 12/1/2011 12:10:00 P
Comment:

Test	Lab	Method	Due Date	Priority
FOG - HEM	M	EPA 1664A	12/13/2011	<u>Normal (6-10 Days)</u>

Customer Name: GOLDER ASSOCIATES
18300 NE UNION HILL RD. STE. 200
REDMOND WA 98052

Order ID: 111201025
Order Date: 12/1/2011

Contact Name: DEREK HOLOM

Project Name: SVL #W1K0622

Comment:

Sample #: 111201025-008 **Customer Sample #:** 11252011SW120

Recv'd: **Collector:** **Date Collected:** 11/25/2011
Quantity: 1 **Matrix:** Water **Date Received:** 12/1/2011 12:10:00 P
Comment:

Test	Lab	Method	Due Date	Priority
FOG - HEM	M	EPA 1664A	12/13/2011	<u>Normal (6-10 Days)</u>

Sample #: 111201025-009 **Customer Sample #:** 11262011SW021

Recv'd: **Collector:** **Date Collected:** 11/26/2011
Quantity: 1 **Matrix:** Water **Date Received:** 12/1/2011 12:10:00 P
Comment:

Test	Lab	Method	Due Date	Priority
FOG - HEM	M	EPA 1664A	12/13/2011	<u>Normal (6-10 Days)</u>

Sample #: 111201025-010 **Customer Sample #:** 11262011SW221

Recv'd: **Collector:** **Date Collected:** 11/26/2011
Quantity: 1 **Matrix:** Water **Date Received:** 12/1/2011 12:10:00 P
Comment:

Test	Lab	Method	Due Date	Priority
FOG - HEM	M	EPA 1664A	12/13/2011	<u>Normal (6-10 Days)</u>

SAMPLE CONDITION RECORD

Samples received in a cooler?	Yes
Samples received intact?	Yes
What is the temperature inside the cooler?	3.5
Samples received with a COC?	Yes
Samples received within holding time?	Yes
Are all sample bottles properly preserved?	Yes
Are VOC samples free of headspace?	N/A
Is there a trip blank to accompany VOC samples?	N/A
Labels and chain agree?	Yes



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: W1K0622

Reported: 16-Dec-11 10:39

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Sampled By	Date Received
11212011SW011	W1K0622-01	Surface Water	21-Nov-11 14:00	DH/JE	30-Nov-2011
11212011SW012	W1K0622-02	Surface Water	21-Nov-11 15:00	DH/JE	30-Nov-2011
11212011SW013	W1K0622-03	Surface Water	21-Nov-11 15:30	DH/JE	30-Nov-2011
11222011SW015	W1K0622-04	Surface Water	22-Nov-11 16:00	DH/JE	30-Nov-2011
11242011SW017	W1K0622-05	Surface Water	24-Nov-11 11:35	DH/JE	30-Nov-2011
11242011SW018	W1K0622-06	Surface Water	24-Nov-11 13:50	DH/JE	30-Nov-2011
11242011SW019	W1K0622-07	Surface Water	24-Nov-11 15:15	DH/JE	30-Nov-2011
11242011SW119	W1K0622-08	Surface Water	24-Nov-11 15:15	DH/JE	30-Nov-2011
11252011SW020	W1K0622-09	Surface Water	25-Nov-11 09:30	DH/JE	30-Nov-2011
11252011SW120	W1K0622-10	Surface Water	25-Nov-11 09:30	DH/JE	30-Nov-2011
11262011SW021	W1K0622-11	Surface Water	26-Nov-11 10:45	DH/JE	30-Nov-2011
11262011SW221	W1K0622-12	Surface Water	26-Nov-11 11:00	DH/JE	30-Nov-2011
11262011SW022	W1K0622-13	Surface Water	26-Nov-11 14:00	DH/JE	30-Nov-2011
11262011SW023	W1K0622-14	Surface Water	26-Nov-11 14:15	DH/JE	30-Nov-2011
11262011SW024	W1K0622-15	Surface Water	26-Nov-11 14:30	DH/JE	30-Nov-2011

Solid samples are analyzed on an as-received, wet-weight basis, unless otherwise requested. Non-Detects are reported at the MDL.

Sample preparation is defined by the client as per their Data Quality Objectives.

This report supercedes any previous reports for this Work Order. The complete report includes pages for each sample, a full QC report, and a notes section.

The results presented in this report relate only to the samples, and meet all requirements of the NELAC Standards unless otherwise noted.

Case Narrative

12/16/11 (jk) - C/A balances and TDS ratios may be due to precipitate and particulates in samples. Samples 4 and 5 were particularly difficult samples. Many samples had high turbidity and that may also play a part. As an example, Sample 4 was analyzed three times for TDS (because we had poor TDS/CTDS ratios and we obtained three different results. This sample appears to be coagulant like in nature. We have reported all three values for TDS for this sample.



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: W1K0622

Reported: 16-Dec-11 10:39

Client Sample ID: 11212011SW011

SVL Sample ID: W1K0622-01 (Surface Water)

Sample Report Page 1 of 3

Sampled: 21-Nov-11 14:00

Received: 30-Nov-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W150236	DJA	12/09/11 14:06	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	0.124	mg/L	0.080	0.008		W149245	TJK	12/12/11 12:28	
EPA 200.7	Barium	0.0106	mg/L	0.0020	0.0002		W149245	TJK	12/12/11 12:29	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0002		W149245	TJK	12/12/11 12:28	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W149245	TJK	12/12/11 12:28	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0002		W149245	TJK	12/12/11 12:29	
EPA 200.7	Calcium	1.66	mg/L	0.040	0.006		W149245	TJK	12/12/11 12:27	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0003		W149245	TJK	12/12/11 12:29	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W149245	TJK	12/12/11 12:29	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.002		W149245	TJK	12/12/11 12:29	
EPA 200.7	Iron	5.71	mg/L	0.060	0.008		W149245	TJK	12/12/11 12:28	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0017		W149245	AS	12/12/11 15:55	
EPA 200.7	Magnesium	1.58	mg/L	0.060	0.010		W149245	TJK	12/12/11 12:28	
EPA 200.7	Manganese	0.0975	mg/L	0.0040	0.0006		W149245	TJK	12/12/11 12:28	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.0006		W149245	TJK	12/12/11 12:29	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W149245	TJK	12/12/11 12:29	
EPA 200.7	Potassium	1.07	mg/L	0.50	0.03		W149245	AS	12/12/11 15:53	
EPA 200.7	Silicon	3.68	mg/L	0.08	0.01		W149245	TJK	12/12/11 12:28	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0003		W149245	TJK	12/12/11 12:29	
EPA 200.7	Sodium	3.36	mg/L	0.50	0.02		W149245	AS	12/12/11 15:53	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0002		W149245	TJK	12/12/11 12:29	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0002		W149245	TJK	12/12/11 12:29	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0010		W149245	TJK	12/12/11 12:29	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00009	2.5	W149249	KWH	12/06/11 10:29	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0006	2.5	W149249	KWH	12/06/11 10:29	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00070	2.5	W149249	KWH	12/06/11 10:29	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000015	2.5	W149249	KWH	12/06/11 10:29	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000011	2.5	W149249	KWH	12/06/11 10:29	
SM 2340B	Hardness (as CaCO3)	10.7	mg/L	0.347	0.058		N/A		12/12/11 12:28	



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1K0622**

Reported: 16-Dec-11 10:39

Client Sample ID: **11212011SW011**

Sampled: 21-Nov-11 14:00

SVL Sample ID: **W1K0622-01 (Surface Water)**

Received: 30-Nov-11

Sample Report Page 2 of 3

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.016		W149246	AS	12/12/11 17:58	
EPA 200.7	Barium	0.0086	mg/L	0.0020	0.0004		W149246	AS	12/12/11 18:00	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0004		W149246	AS	12/12/11 17:58	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W149246	AS	12/12/11 17:58	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W149246	AS	12/12/11 18:00	
EPA 200.7	Calcium	1.74	mg/L	0.040	0.012		W149246	AS	12/12/11 17:58	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W149246	AS	12/12/11 18:00	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W149246	AS	12/12/11 18:00	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.003		W149246	AS	12/12/11 17:59	
EPA 200.7	Iron	1.41	mg/L	0.060	0.017		W149246	AS	12/12/11 17:58	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0034		W149246	AS	12/12/11 18:00	
EPA 200.7	Magnesium	1.57	mg/L	0.060	0.021		W149246	AS	12/12/11 17:58	
EPA 200.7	Manganese	0.0907	mg/L	0.0040	0.0011		W149246	AS	12/12/11 17:58	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W149246	AS	12/12/11 18:00	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W149246	AS	12/12/11 18:00	
EPA 200.7	Potassium	1.20	mg/L	0.50	0.07		W149246	AS	12/12/11 17:58	
EPA 200.7	Silicon	3.35	mg/L	0.08	0.03		W149246	AS	12/12/11 17:58	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0005		W149246	AS	12/12/11 17:59	
EPA 200.7	Sodium	3.50	mg/L	0.50	0.04		W149246	AS	12/12/11 17:58	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W149246	AS	12/12/11 18:00	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W149246	AS	12/12/11 17:59	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0021		W149246	AS	12/12/11 18:00	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00007		W149270	KWH	12/07/11 11:37	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0005		W149270	KWH	12/07/11 11:37	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00056		W149270	KWH	12/07/11 11:37	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000012		W149270	KWH	12/07/11 11:37	

Classical Chemistry Parameters

EPA 120.1	Specific conductance	59.0	µmhos/cm	5.00			W149329	JMS	12/05/11 08:12	
EPA 180.1	Turbidity	58.5	NTU	0.500		5	W149308	SM	12/01/11 15:57	D2,H3
EPA 350.1	Ammonia as N	1.40	mg/L	0.060	0.018	2	W149298	RHW	12/06/11 10:34	D2
EPA 353.2	Nitrate/Nitrite as N	0.684	mg/L	0.050	0.015		W150178	RHW	12/08/11 11:14	
EPA 410.4	Chemical Oxygen Demand	< 5.0	mg/L	5.0	2.1		W150044	SM	12/06/11 11:22	
SM 2320B/2310B	Bicarbonate	13.8	mg/L	1.0	0.5		W149271	DKS	12/01/11 12:31	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.5		W149271	DKS	12/01/11 12:31	
SM 2320B/2310B	Total Alkalinity	13.8	mg/L	1.0	0.5		W149271	DKS	12/01/11 12:31	
SM 2540 C	Total Diss. Solids	57	mg/L	10			W149262	RS	12/01/11 14:10	H3
SM 2540 D	Total Susp. Solids	7.0	mg/L	5.0			W149257	RS	12/01/11 14:10	H3
SM 4500 H B	pH @20.0°C	6.66	pH Units				W149271	DKS	12/01/11 12:31	H5
SM 4500-P-E	Phosphorus	< 0.010	mg/L	0.010	0.004		W149343	SM	12/05/11 16:57	
SM 5310B	Total Organic Carbon	4.07	mg/L	1.00	0.18		W150161	SM	12/07/11 19:32	



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

(208) 784-1258

Fax (208) 783-0891

Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1K0622**

Reported: 16-Dec-11 10:39

Client Sample ID: **11212011SW011**

SVL Sample ID: **W1K0622-01 (Surface Water)**

Sample Report Page 3 of 3

Sampled: 21-Nov-11 14:00

Received: 30-Nov-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	6.08	mg/L	0.20	0.07		W150116	AEW	12/06/11 13:54	
EPA 300.0	Fluoride	< 0.10	mg/L	0.10	0.02		W150116	AEW	12/06/11 13:54	
EPA 300.0	Sulfate as SO4	1.72	mg/L	0.30	0.04		W150116	AEW	12/06/11 13:54	

Cation/Anion Balance and TDS Ratios

Cation Sum: 0.54 meq/L Anion Sum: 0.53 meq/L C/A Balance: 0.76 % Calculated TDS: 36 TDS/cTDS: 1.56 TDS/eC: 0.97

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Golder Associates (WA)
 18300 NE Union Hill Road, Suite 200
 Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1K0622**

Reported: 16-Dec-11 10:39

Client Sample ID: **11212011SW012**

SVL Sample ID: **W1K0622-02 (Surface Water)**

Sample Report Page 1 of 3

Sampled: 21-Nov-11 15:00

Received: 30-Nov-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total)										
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W150236	DJA	12/09/11 14:14	
Metals (Total Recoverable--reportable as Total per 40 CFR 136)										
EPA 200.7	Aluminum	0.119	mg/L	0.080	0.008		W149245	TJK	12/12/11 12:33	
EPA 200.7	Barium	0.0037	mg/L	0.0020	0.0002		W149245	TJK	12/12/11 12:35	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0002		W149245	TJK	12/12/11 12:33	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W149245	TJK	12/12/11 12:33	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0002		W149245	TJK	12/12/11 12:35	
EPA 200.7	Calcium	1.13	mg/L	0.040	0.006		W149245	TJK	12/12/11 12:33	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0003		W149245	TJK	12/12/11 12:34	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W149245	TJK	12/12/11 12:35	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.002		W149245	TJK	12/12/11 12:34	
EPA 200.7	Iron	4.98	mg/L	0.060	0.008		W149245	TJK	12/12/11 12:33	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0017		W149245	AS	12/12/11 16:00	
EPA 200.7	Magnesium	1.19	mg/L	0.060	0.010		W149245	TJK	12/12/11 12:33	
EPA 200.7	Manganese	0.0414	mg/L	0.0040	0.0006		W149245	TJK	12/12/11 12:33	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.0006		W149245	TJK	12/12/11 12:35	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W149245	TJK	12/12/11 12:35	
EPA 200.7	Potassium	0.54	mg/L	0.50	0.03		W149245	AS	12/12/11 15:59	
EPA 200.7	Silicon	3.50	mg/L	0.08	0.01		W149245	TJK	12/12/11 12:33	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0003		W149245	TJK	12/12/11 12:34	
EPA 200.7	Sodium	2.76	mg/L	0.50	0.02		W149245	AS	12/12/11 15:59	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0002		W149245	TJK	12/12/11 12:34	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0002		W149245	TJK	12/12/11 12:34	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0010		W149245	TJK	12/12/11 12:35	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00009	2.5	W149249	KWH	12/06/11 10:34	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0006	2.5	W149249	KWH	12/06/11 10:34	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00070	2.5	W149249	KWH	12/06/11 10:34	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000015	2.5	W149249	KWH	12/06/11 10:34	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000011	2.5	W149249	KWH	12/06/11 10:34	
SM 2340B	Hardness (as CaCO3)	7.74	mg/L	0.347	0.058		N/A		12/12/11 12:33	



Golder Associates (WA)
 18300 NE Union Hill Road, Suite 200
 Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1K0622**

Reported: 16-Dec-11 10:39

Client Sample ID: **11212011SW012**

Sampled: 21-Nov-11 15:00

SVL Sample ID: **W1K0622-02 (Surface Water)**

Received: 30-Nov-11

Sample Report Page 2 of 3

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.016		W149246	AS	12/12/11 18:16	
EPA 200.7	Barium	0.0030	mg/L	0.0020	0.0004		W149246	AS	12/12/11 18:17	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0004		W149246	AS	12/12/11 18:16	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W149246	AS	12/12/11 18:16	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W149246	AS	12/12/11 18:17	
EPA 200.7	Calcium	1.22	mg/L	0.040	0.012		W149246	AS	12/12/11 18:16	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W149246	AS	12/12/11 18:17	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W149246	AS	12/12/11 18:17	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.003		W149246	AS	12/12/11 18:17	
EPA 200.7	Iron	0.927	mg/L	0.060	0.017		W149246	AS	12/12/11 18:16	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0034		W149246	AS	12/12/11 18:17	
EPA 200.7	Magnesium	1.20	mg/L	0.060	0.021		W149246	AS	12/12/11 18:16	
EPA 200.7	Manganese	0.0386	mg/L	0.0040	0.0011		W149246	AS	12/12/11 18:16	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W149246	AS	12/12/11 18:17	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W149246	AS	12/12/11 18:17	
EPA 200.7	Potassium	0.54	mg/L	0.50	0.07		W149246	AS	12/12/11 18:16	
EPA 200.7	Silicon	3.23	mg/L	0.08	0.03		W149246	AS	12/12/11 18:16	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0005		W149246	AS	12/12/11 18:17	
EPA 200.7	Sodium	2.86	mg/L	0.50	0.04		W149246	AS	12/12/11 18:16	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W149246	AS	12/12/11 18:17	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W149246	AS	12/12/11 18:17	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0021		W149246	AS	12/12/11 18:17	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00007		W149270	KWH	12/07/11 11:45	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0005		W149270	KWH	12/07/11 11:45	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00056		W149270	KWH	12/07/11 11:45	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000012		W149270	KWH	12/07/11 11:45	

Classical Chemistry Parameters

EPA 120.1	Specific conductance	37.4	µmhos/cm	5.00			W149329	JMS	12/05/11 08:12	
EPA 180.1	Turbidity	26.4	NTU	0.100			W149308	SM	12/01/11 15:57	H3
EPA 350.1	Ammonia as N	0.458	mg/L	0.030	0.009		W149298	RHW	12/06/11 10:03	
EPA 353.2	Nitrate/Nitrite as N	0.390	mg/L	0.050	0.015		W150178	RHW	12/08/11 11:15	
EPA 410.4	Chemical Oxygen Demand	< 5.0	mg/L	5.0	2.1		W150044	SM	12/06/11 11:22	
SM 2320B/2310B	Bicarbonate	8.4	mg/L	1.0	0.5		W149271	DKS	12/01/11 12:41	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.5		W149271	DKS	12/01/11 12:41	
SM 2320B/2310B	Total Alkalinity	8.4	mg/L	1.0	0.5		W149271	DKS	12/01/11 12:41	
SM 2540 C	Total Diss. Solids	47	mg/L	10			W149262	RS	12/01/11 14:10	H3
SM 2540 D	Total Susp. Solids	8.0	mg/L	5.0			W149257	RS	12/01/11 14:10	H3
SM 4500 H B	pH @20.0°C	6.60	pH Units				W149271	DKS	12/01/11 12:41	H5
SM 4500-P-E	Phosphorus	0.012	mg/L	0.010	0.004		W149343	SM	12/05/11 16:57	
SM 5310B	Total Organic Carbon	4.09	mg/L	1.00	0.18		W150161	SM	12/07/11 20:10	



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

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Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1K0622**

Reported: 16-Dec-11 10:39

Client Sample ID: **11212011SW012**

SVL Sample ID: **W1K0622-02 (Surface Water)**

Sample Report Page 3 of 3

Sampled: 21-Nov-11 15:00

Received: 30-Nov-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	4.52	mg/L	0.20	0.07		W150116	AEW	12/06/11 14:21	
EPA 300.0	Fluoride	< 0.10	mg/L	0.10	0.02		W150116	AEW	12/06/11 14:21	
EPA 300.0	Sulfate as SO4	0.59	mg/L	0.30	0.04		W150116	AEW	12/06/11 14:21	

Cation/Anion Balance and TDS Ratios

Cation Sum: 0.36 meq/L Anion Sum: 0.34 meq/L C/A Balance: 2.98 % Calculated TDS: 27 TDS/cTDS: 1.76 TDS/eC: 1.26

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: W1K0622

Reported: 16-Dec-11 10:39

Client Sample ID: 11212011SW013

SVL Sample ID: W1K0622-03 (Surface Water)

Sample Report Page 1 of 3

Sampled: 21-Nov-11 15:30

Received: 30-Nov-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W150236	DJA	12/09/11 14:16	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	0.190	mg/L	0.080	0.008		W149245	TJK	12/12/11 12:50	
EPA 200.7	Barium	0.0038	mg/L	0.0020	0.0002		W149245	TJK	12/12/11 12:51	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0002		W149245	TJK	12/12/11 12:50	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W149245	TJK	12/12/11 12:50	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0002		W149245	TJK	12/12/11 12:51	
EPA 200.7	Calcium	1.30	mg/L	0.040	0.006		W149245	TJK	12/12/11 12:50	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0003		W149245	TJK	12/12/11 12:51	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W149245	TJK	12/12/11 12:51	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.002		W149245	TJK	12/12/11 12:51	
EPA 200.7	Iron	4.89	mg/L	0.060	0.008		W149245	TJK	12/12/11 12:50	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0017		W149245	AS	12/12/11 17:31	
EPA 200.7	Magnesium	1.28	mg/L	0.060	0.010		W149245	TJK	12/12/11 12:50	
EPA 200.7	Manganese	0.0201	mg/L	0.0040	0.0006		W149245	TJK	12/12/11 12:50	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.0006		W149245	TJK	12/12/11 12:51	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W149245	TJK	12/12/11 12:51	
EPA 200.7	Potassium	0.72	mg/L	0.50	0.03		W149245	AS	12/12/11 17:29	
EPA 200.7	Silicon	2.97	mg/L	0.08	0.01		W149245	TJK	12/12/11 12:50	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0003		W149245	TJK	12/12/11 12:51	
EPA 200.7	Sodium	2.62	mg/L	0.50	0.02		W149245	AS	12/12/11 17:29	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0002		W149245	TJK	12/12/11 12:51	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0002		W149245	TJK	12/12/11 12:51	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0010		W149245	TJK	12/12/11 12:51	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00009	2.5	W149249	KWH	12/06/11 10:35	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0006	2.5	W149249	KWH	12/06/11 10:35	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00070	2.5	W149249	KWH	12/06/11 10:35	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000015	2.5	W149249	KWH	12/06/11 10:35	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000011	2.5	W149249	KWH	12/06/11 10:35	
SM 2340B	Hardness (as CaCO3)	8.51	mg/L	0.347	0.058		N/A		12/12/11 12:50	



Golder Associates (WA)
 18300 NE Union Hill Road, Suite 200
 Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1K0622**

Reported: 16-Dec-11 10:39

Client Sample ID: **11212011SW013**

Sampled: 21-Nov-11 15:30

SVL Sample ID: **W1K0622-03 (Surface Water)**

Received: 30-Nov-11

Sample Report Page 2 of 3

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.016		W149246	AS	12/12/11 18:22	
EPA 200.7	Barium	< 0.0020	mg/L	0.0020	0.0004		W149246	AS	12/12/11 18:23	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0004		W149246	AS	12/12/11 18:22	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W149246	AS	12/12/11 18:22	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W149246	AS	12/12/11 18:23	
EPA 200.7	Calcium	1.36	mg/L	0.040	0.012		W149246	AS	12/12/11 18:22	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W149246	AS	12/12/11 18:23	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W149246	AS	12/12/11 18:23	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.003		W149246	AS	12/12/11 18:23	
EPA 200.7	Iron	1.07	mg/L	0.060	0.017		W149246	AS	12/12/11 18:22	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0034		W149246	AS	12/12/11 18:23	
EPA 200.7	Magnesium	1.21	mg/L	0.060	0.021		W149246	AS	12/12/11 18:22	
EPA 200.7	Manganese	0.0179	mg/L	0.0040	0.0011		W149246	AS	12/12/11 18:22	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W149246	AS	12/12/11 18:23	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W149246	AS	12/12/11 18:23	
EPA 200.7	Potassium	0.70	mg/L	0.50	0.07		W149246	AS	12/12/11 18:21	
EPA 200.7	Silicon	2.66	mg/L	0.08	0.03		W149246	AS	12/12/11 18:22	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0005		W149246	AS	12/12/11 18:23	
EPA 200.7	Sodium	2.68	mg/L	0.50	0.04		W149246	AS	12/12/11 18:21	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W149246	AS	12/12/11 18:23	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W149246	AS	12/12/11 18:23	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0021		W149246	AS	12/12/11 18:23	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00007		W149270	KWH	12/07/11 11:47	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0005		W149270	KWH	12/07/11 11:47	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00056		W149270	KWH	12/07/11 11:47	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000012		W149270	KWH	12/07/11 11:47	

Classical Chemistry Parameters

EPA 120.1	Specific conductance	34.0	µmhos/cm	5.00			W149329	JMS	12/05/11 08:12	
EPA 180.1	Turbidity	24.2	NTU	0.100			W149308	SM	12/01/11 15:57	H3
EPA 350.1	Ammonia as N	< 0.030	mg/L	0.030	0.009		W149298	RHW	12/06/11 10:04	
EPA 353.2	Nitrate/Nitrite as N	0.299	mg/L	0.050	0.015		W150178	RHW	12/08/11 11:16	
EPA 410.4	Chemical Oxygen Demand	18.0	mg/L	5.0	2.1		W150044	SM	12/06/11 11:22	
SM 2320B/2310B	Bicarbonate	8.8	mg/L	1.0	0.5		W149271	DKS	12/01/11 12:48	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.5		W149271	DKS	12/01/11 12:48	
SM 2320B/2310B	Total Alkalinity	8.8	mg/L	1.0	0.5		W149271	DKS	12/01/11 12:48	
SM 2540 C	Total Diss. Solids	47	mg/L	10			W149262	RS	12/01/11 14:10	H3
SM 2540 D	Total Susp. Solids	5.0	mg/L	5.0			W149257	RS	12/01/11 14:10	H3
SM 4500 H B	pH @20.0°C	6.54	pH Units				W149271	DKS	12/01/11 12:48	H5
SM 4500-P-E	Phosphorus	0.010	mg/L	0.010	0.004		W149343	SM	12/05/11 16:57	
SM 5310B	Total Organic Carbon	5.72	mg/L	1.00	0.18		W150161	SM	12/07/11 20:22	



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Kellogg ID 83837-0929

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Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1K0622**

Reported: 16-Dec-11 10:39

Client Sample ID: **11212011SW013**

SVL Sample ID: **W1K0622-03 (Surface Water)**

Sample Report Page 3 of 3

Sampled: 21-Nov-11 15:30

Received: 30-Nov-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	3.78	mg/L	0.20	0.07		W150116	AEW	12/06/11 14:30	
EPA 300.0	Fluoride	< 0.10	mg/L	0.10	0.02		W150116	AEW	12/06/11 14:30	
EPA 300.0	Sulfate as SO4	0.42	mg/L	0.30	0.04		W150116	AEW	12/06/11 14:30	

Cation/Anion Balance and TDS Ratios

Cation Sum: 0.34 meq/L Anion Sum: 0.31 meq/L C/A Balance: 3.69 % Calculated TDS: 24 TDS/cTDS: 1.93 TDS/eC: 1.38

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: W1K0622

Reported: 16-Dec-11 10:39

Client Sample ID: 11222011SW015

SVL Sample ID: W1K0622-04 (Surface Water)

Sample Report Page 1 of 3

Sampled: 22-Nov-11 16:00

Received: 30-Nov-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	0.00113	mg/L	0.00020	0.000072		W150236	DJA	12/09/11 14:18	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	18.6	mg/L	0.080	0.008		W149245	TJK	12/12/11 12:55	
EPA 200.7	Barium	0.135	mg/L	0.0020	0.0002		W149245	TJK	12/12/11 12:57	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0002		W149245	TJK	12/12/11 12:56	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W149245	TJK	12/12/11 12:56	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0002		W149245	TJK	12/12/11 12:57	
EPA 200.7	Calcium	1.44	mg/L	0.040	0.006		W149245	TJK	12/12/11 12:56	
EPA 200.7	Chromium	0.0833	mg/L	0.0060	0.0003		W149245	TJK	12/12/11 12:57	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W149245	TJK	12/12/11 12:57	
EPA 200.7	Copper	0.045	mg/L	0.010	0.002		W149245	TJK	12/12/11 12:57	
EPA 200.7	Iron	23.8	mg/L	0.060	0.008		W149245	TJK	12/12/11 12:55	
EPA 200.7	Lead	0.0113	mg/L	0.0075	0.0017		W149245	AS	12/12/11 16:22	
EPA 200.7	Magnesium	1.55	mg/L	0.060	0.010		W149245	TJK	12/12/11 12:56	
EPA 200.7	Manganese	0.0619	mg/L	0.0040	0.0006		W149245	TJK	12/12/11 12:56	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.0006		W149245	TJK	12/12/11 12:57	
EPA 200.7	Nickel	0.039	mg/L	0.010	0.002		W149245	TJK	12/12/11 12:57	
EPA 200.7	Potassium	1.36	mg/L	0.50	0.03		W149245	AS	12/12/11 16:20	
EPA 200.7	Silicon	18.4	mg/L	0.08	0.01		W149245	TJK	12/12/11 12:55	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0003		W149245	TJK	12/12/11 12:57	
EPA 200.7	Sodium	3.10	mg/L	0.50	0.02		W149245	AS	12/12/11 16:20	
EPA 200.7	Titanium	0.0547	mg/L	0.0050	0.0002		W149245	TJK	12/12/11 12:57	
EPA 200.7	Vanadium	0.0609	mg/L	0.0050	0.0002		W149245	TJK	12/12/11 12:57	
EPA 200.7	Zinc	0.0251	mg/L	0.0100	0.0010		W149245	TJK	12/12/11 12:57	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00009	2.5	W149249	KWH	12/06/11 10:37	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0006	2.5	W149249	KWH	12/06/11 10:37	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00070	2.5	W149249	KWH	12/06/11 10:37	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000015	2.5	W149249	KWH	12/06/11 10:37	
EPA 200.8	Uranium	0.00116	mg/L	0.00100	0.000011	2.5	W149249	KWH	12/06/11 10:37	
SM 2340B	Hardness (as CaCO3)	9.98	mg/L	0.347	0.058		N/A		12/12/11 12:56	



Golder Associates (WA)
 18300 NE Union Hill Road, Suite 200
 Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1K0622**

Reported: 16-Dec-11 10:39

Client Sample ID: **11222011SW015**

SVL Sample ID: **W1K0622-04 (Surface Water)**

Sample Report Page 2 of 3

Sampled: 22-Nov-11 16:00

Received: 30-Nov-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	0.101	mg/L	0.080	0.016		W149246	AS	12/12/11 18:27	
EPA 200.7	Barium	0.0021	mg/L	0.0020	0.0004		W149246	AS	12/12/11 18:29	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0004		W149246	AS	12/12/11 18:27	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W149246	AS	12/12/11 18:27	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W149246	AS	12/12/11 18:29	
EPA 200.7	Calcium	0.844	mg/L	0.040	0.012		W149246	AS	12/12/11 18:27	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W149246	AS	12/12/11 18:29	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W149246	AS	12/12/11 18:29	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.003		W149246	AS	12/12/11 18:29	
EPA 200.7	Iron	0.537	mg/L	0.060	0.017		W149246	AS	12/12/11 18:27	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0034		W149246	AS	12/12/11 18:29	
EPA 200.7	Magnesium	0.823	mg/L	0.060	0.021		W149246	AS	12/12/11 18:27	
EPA 200.7	Manganese	0.0235	mg/L	0.0040	0.0011		W149246	AS	12/12/11 18:27	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W149246	AS	12/12/11 18:29	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W149246	AS	12/12/11 18:29	
EPA 200.7	Potassium	0.68	mg/L	0.50	0.07		W149246	AS	12/12/11 18:27	
EPA 200.7	Silicon	3.45	mg/L	0.08	0.03		W149246	AS	12/12/11 18:27	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0005		W149246	AS	12/12/11 18:29	
EPA 200.7	Sodium	3.10	mg/L	0.50	0.04		W149246	AS	12/12/11 18:27	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W149246	AS	12/12/11 18:29	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W149246	AS	12/12/11 18:29	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0021		W149246	AS	12/12/11 18:29	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00007		W149270	KWH	12/07/11 11:51	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0005		W149270	KWH	12/07/11 11:51	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00056		W149270	KWH	12/07/11 11:51	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000012		W149270	KWH	12/07/11 11:51	
Classical Chemistry Parameters										
ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0009		W149305	CFF	12/02/11 13:16	
EPA 120.1	Specific conductance	32.6	µmhos/cm	5.00			W149329	JMS	12/05/11 08:12	
EPA 180.1	Turbidity	1400	NTU	5.00		50	W149308	SM	12/01/11 15:57	D2,H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0024		W149301	CFF	12/02/11 12:48	
EPA 350.1	Ammonia as N	0.304	mg/L	0.030	0.009		W149298	RHW	12/06/11 10:12	
EPA 353.2	Nitrate/Nitrite as N	0.213	mg/L	0.050	0.015		W150178	RHW	12/08/11 11:18	
EPA 410.4	Chemical Oxygen Demand	70.9	mg/L	5.0	2.1		W150044	SM	12/06/11 11:22	
SM 2320B/2310B	Bicarbonate	4.7	mg/L	1.0	0.5		W149271	DKS	12/01/11 12:56	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.5		W149271	DKS	12/01/11 12:56	
SM 2320B/2310B	Total Alkalinity	4.7	mg/L	1.0	0.5		W149271	DKS	12/01/11 12:56	
SM 2540 C	Total Diss. Solids	660	mg/L	20			W149262	RS	12/01/11 14:10	H3
SM 2540 C	Total Diss. Solids	506	mg/L	20			W149353	RS	12/02/11 11:53	H3
SM 2540 C	Total Diss. Solids	420	mg/L	100			W151183	RS	12/14/11 14:12	H3
SM 2540 D	Total Susp. Solids	568	mg/L	10.0			W149354	RS	12/02/11 11:53	H3
SM 4500 H B	pH @20.0°C	6.16	pH Units				W149271	DKS	12/01/11 12:56	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0013		W149302	CFF	12/02/11 13:46	
SM 4500-P-E	Phosphorus	0.377	mg/L	0.010	0.004		W149343	SM	12/05/11 16:57	
SM 5310B	Total Organic Carbon	10.9	mg/L	1.00	0.18		W150161	SM	12/07/11 20:34	



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

(208) 784-1258

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Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1K0622**

Reported: 16-Dec-11 10:39

Client Sample ID: **11222011SW015**

SVL Sample ID: **W1K0622-04 (Surface Water)**

Sample Report Page 3 of 3

Sampled: 22-Nov-11 16:00

Received: 30-Nov-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	5.38	mg/L	0.20	0.07		W150116	AEW	12/06/11 14:39	
EPA 300.0	Fluoride	< 0.10	mg/L	0.10	0.02		W150116	AEW	12/06/11 14:39	
EPA 300.0	Sulfate as SO4	0.97	mg/L	0.30	0.04		W150116	AEW	12/06/11 14:39	

Cation/Anion Balance and TDS Ratios

Cation Sum: 0.32 meq/L Anion Sum: 0.28 meq/L C/A Balance: 5.52 % Calculated TDS: 46 TDS/cTDS: 9.10 TDS/eC: 12.88

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: W1K0622

Reported: 16-Dec-11 10:39

Client Sample ID: 11242011SW017

SVL Sample ID: W1K0622-05 (Surface Water)

Sample Report Page 1 of 3

Sampled: 24-Nov-11 11:35

Received: 30-Nov-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W150236	DJA	12/09/11 14:19	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	20.7	mg/L	0.080	0.008		W149245	TJK	12/12/11 13:01	
EPA 200.7	Barium	0.137	mg/L	0.0020	0.0002		W149245	TJK	12/12/11 13:02	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0002		W149245	TJK	12/12/11 13:01	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W149245	TJK	12/12/11 13:01	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0002		W149245	TJK	12/12/11 13:02	
EPA 200.7	Calcium	1.05	mg/L	0.040	0.006		W149245	TJK	12/12/11 13:01	
EPA 200.7	Chromium	0.123	mg/L	0.0060	0.0003		W149245	TJK	12/12/11 13:02	
EPA 200.7	Cobalt	0.0137	mg/L	0.0060	0.0005		W149245	TJK	12/12/11 13:03	
EPA 200.7	Copper	0.052	mg/L	0.010	0.002		W149245	TJK	12/12/11 13:02	
EPA 200.7	Iron	29.0	mg/L	0.060	0.008		W149245	TJK	12/12/11 13:01	
EPA 200.7	Lead	0.0226	mg/L	0.0075	0.0017		W149245	AS	12/12/11 16:27	
EPA 200.7	Magnesium	1.55	mg/L	0.060	0.010		W149245	TJK	12/12/11 13:01	
EPA 200.7	Manganese	0.227	mg/L	0.0040	0.0006		W149245	TJK	12/12/11 13:01	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.0006		W149245	TJK	12/12/11 13:03	
EPA 200.7	Nickel	0.050	mg/L	0.010	0.002		W149245	TJK	12/12/11 13:02	
EPA 200.7	Potassium	1.55	mg/L	0.50	0.03		W149245	AS	12/12/11 16:25	
EPA 200.7	Silicon	21.9	mg/L	0.08	0.01		W149245	TJK	12/12/11 13:01	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0003		W149245	TJK	12/12/11 13:02	
EPA 200.7	Sodium	4.15	mg/L	0.50	0.02		W149245	AS	12/12/11 16:25	
EPA 200.7	Titanium	0.0524	mg/L	0.0050	0.0002		W149245	TJK	12/12/11 13:02	
EPA 200.7	Vanadium	0.108	mg/L	0.0050	0.0002		W149245	TJK	12/12/11 13:02	
EPA 200.7	Zinc	0.0443	mg/L	0.0100	0.0010		W149245	TJK	12/12/11 13:03	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00009	2.5	W149249	KWH	12/06/11 10:38	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0006	2.5	W149249	KWH	12/06/11 10:38	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00070	2.5	W149249	KWH	12/06/11 10:38	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000015	2.5	W149249	KWH	12/06/11 10:38	
EPA 200.8	Uranium	0.00297	mg/L	0.00100	0.000011	2.5	W149249	KWH	12/06/11 10:38	
SM 2340B	Hardness (as CaCO3)	8.99	mg/L	0.347	0.058		N/A		12/12/11 13:01	



Golder Associates (WA)
 18300 NE Union Hill Road, Suite 200
 Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1K0622**

Reported: 16-Dec-11 10:39

Client Sample ID: **11242011SW017**

Sampled: 24-Nov-11 11:35

SVL Sample ID: **W1K0622-05 (Surface Water)**

Received: 30-Nov-11

Sample Report Page 2 of 3

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Dissolved)

EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.016		W149246	AS	12/12/11 18:33	
EPA 200.7	Barium	0.0057	mg/L	0.0020	0.0004		W149246	AS	12/12/11 18:35	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0004		W149246	AS	12/12/11 18:33	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W149246	AS	12/12/11 18:33	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W149246	AS	12/12/11 18:35	
EPA 200.7	Calcium	0.796	mg/L	0.040	0.012		W149246	AS	12/12/11 18:33	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W149246	AS	12/12/11 18:35	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W149246	AS	12/12/11 18:35	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.003		W149246	AS	12/12/11 18:34	
EPA 200.7	Iron	3.25	mg/L	0.060	0.017		W149246	AS	12/12/11 18:33	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0034		W149246	AS	12/12/11 18:35	
EPA 200.7	Magnesium	1.01	mg/L	0.060	0.021		W149246	AS	12/12/11 18:33	
EPA 200.7	Manganese	0.126	mg/L	0.0040	0.0011		W149246	AS	12/12/11 18:33	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W149246	AS	12/12/11 18:35	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W149246	AS	12/12/11 18:35	
EPA 200.7	Potassium	0.81	mg/L	0.50	0.07		W149246	AS	12/12/11 18:33	
EPA 200.7	Silicon	4.78	mg/L	0.08	0.03		W149246	AS	12/12/11 18:33	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0005		W149246	AS	12/12/11 18:34	
EPA 200.7	Sodium	4.16	mg/L	0.50	0.04		W149246	AS	12/12/11 18:33	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W149246	AS	12/12/11 18:35	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W149246	AS	12/12/11 18:34	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0021		W149246	AS	12/12/11 18:35	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00007		W149270	KWH	12/07/11 11:53	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0005		W149270	KWH	12/07/11 11:53	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00056		W149270	KWH	12/07/11 11:53	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000012		W149270	KWH	12/07/11 11:53	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0009		W149305	CFF	12/02/11 13:18	
EPA 120.1	Specific conductance	36.1	µmhos/cm	5.00			W149329	JMS	12/05/11 08:12	
EPA 180.1	Turbidity	2230	NTU	10.0		100	W149308	SM	12/01/11 15:57	D2,H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0024		W149301	CFF	12/02/11 12:50	
EPA 350.1	Ammonia as N	0.166	mg/L	0.030	0.009		W149298	RHW	12/06/11 10:14	
EPA 353.2	Nitrate/Nitrite as N	0.201	mg/L	0.050	0.015		W150178	RHW	12/08/11 11:19	
EPA 410.4	Chemical Oxygen Demand	44.6	mg/L	5.0	2.1		W150044	SM	12/06/11 11:22	
SM 2320B/2310B	Bicarbonate	3.9	mg/L	1.0	0.5		W149271	DKS	12/01/11 13:02	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.5		W149271	DKS	12/01/11 13:02	
SM 2320B/2310B	Total Alkalinity	3.9	mg/L	1.0	0.5		W149271	DKS	12/01/11 13:02	
SM 2540 C	Total Diss. Solids	84	mg/L	20			W149262	RS	12/01/11 14:10	
SM 2540 D	Total Susp. Solids	1440	mg/L	10.0			W149354	RS	12/02/11 11:53	H6
SM 4500 H B	pH @20.0°C	5.76	pH Units				W149271	DKS	12/01/11 13:02	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0013		W149302	CFF	12/02/11 13:48	
SM 4500-P-E	Phosphorus	0.512	mg/L	0.010	0.004		W149343	SM	12/05/11 16:57	
SM 5310B	Total Organic Carbon	10.2	mg/L	1.00	0.18		W150161	SM	12/07/11 21:12	



One Government Gulch - PO Box 929

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Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1K0622**

Reported: 16-Dec-11 10:39

Client Sample ID: **11242011SW017**

SVL Sample ID: **W1K0622-05 (Surface Water)**

Sample Report Page 3 of 3

Sampled: 24-Nov-11 11:35

Received: 30-Nov-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	6.04	mg/L	0.20	0.07		W150116	AEW	12/06/11 14:48	
EPA 300.0	Fluoride	< 0.10	mg/L	0.10	0.02		W150116	AEW	12/06/11 14:48	
EPA 300.0	Sulfate as SO4	1.91	mg/L	0.30	0.04		W150116	AEW	12/06/11 14:48	

Cation/Anion Balance and TDS Ratios

Cation Sum: 0.46 meq/L Anion Sum: 0.30 meq/L C/A Balance: 20.36 % Calculated TDS: 55 TDS/cTDS: 1.53 TDS/eC: 2.33

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: W1K0622

Reported: 16-Dec-11 10:39

Client Sample ID: 11242011SW018

SVL Sample ID: W1K0622-06 (Surface Water)

Sample Report Page 1 of 3

Sampled: 24-Nov-11 13:50

Received: 30-Nov-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W150236	DJA	12/09/11 14:21	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	1.02	mg/L	0.080	0.008		W149245	TJK	12/12/11 13:07	
EPA 200.7	Barium	0.0097	mg/L	0.0020	0.0002		W149245	TJK	12/12/11 13:08	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0002		W149245	TJK	12/12/11 13:07	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W149245	TJK	12/12/11 13:07	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0002		W149245	TJK	12/12/11 13:08	
EPA 200.7	Calcium	1.14	mg/L	0.040	0.006		W149245	TJK	12/12/11 13:07	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0003		W149245	TJK	12/12/11 13:08	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W149245	TJK	12/12/11 13:08	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.002		W149245	TJK	12/12/11 13:08	
EPA 200.7	Iron	6.28	mg/L	0.060	0.008		W149245	TJK	12/12/11 13:07	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0017		W149245	AS	12/12/11 16:43	
EPA 200.7	Magnesium	1.54	mg/L	0.060	0.010		W149245	TJK	12/12/11 13:07	
EPA 200.7	Manganese	0.0239	mg/L	0.0040	0.0006		W149245	TJK	12/12/11 13:07	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.0006		W149245	TJK	12/12/11 13:08	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W149245	TJK	12/12/11 13:08	
EPA 200.7	Potassium	0.78	mg/L	0.50	0.03		W149245	AS	12/12/11 16:41	
EPA 200.7	Silicon	5.42	mg/L	0.08	0.01		W149245	TJK	12/12/11 13:07	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0003		W149245	TJK	12/12/11 13:08	
EPA 200.7	Sodium	3.66	mg/L	0.50	0.02		W149245	AS	12/12/11 16:41	
EPA 200.7	Titanium	0.0095	mg/L	0.0050	0.0002		W149245	TJK	12/12/11 13:08	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0002		W149245	TJK	12/12/11 13:08	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0010		W149245	TJK	12/12/11 13:08	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00009	2.5	W149249	KWH	12/06/11 10:39	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0006	2.5	W149249	KWH	12/06/11 10:39	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00070	2.5	W149249	KWH	12/06/11 10:39	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000015	2.5	W149249	KWH	12/06/11 10:39	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000011	2.5	W149249	KWH	12/06/11 10:39	
SM 2340B	Hardness (as CaCO3)	9.17	mg/L	0.347	0.058		N/A		12/12/11 13:07	



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1K0622**

Reported: 16-Dec-11 10:39

Client Sample ID: **11242011SW018**

Sampled: 24-Nov-11 13:50

SVL Sample ID: **W1K0622-06 (Surface Water)**

Received: 30-Nov-11

Sample Report Page 2 of 3

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Dissolved)

EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.016		W149246	AS	12/12/11 18:39	
EPA 200.7	Barium	0.0055	mg/L	0.0020	0.0004		W149246	AS	12/12/11 18:40	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0004		W149246	AS	12/12/11 18:39	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W149246	AS	12/12/11 18:39	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W149246	AS	12/12/11 18:40	
EPA 200.7	Calcium	1.17	mg/L	0.040	0.012		W149246	AS	12/12/11 18:39	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W149246	AS	12/12/11 18:40	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W149246	AS	12/12/11 18:40	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.003		W149246	AS	12/12/11 18:40	
EPA 200.7	Iron	0.964	mg/L	0.060	0.017		W149246	AS	12/12/11 18:39	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0034		W149246	AS	12/12/11 18:40	
EPA 200.7	Magnesium	1.43	mg/L	0.060	0.021		W149246	AS	12/12/11 18:39	
EPA 200.7	Manganese	0.0206	mg/L	0.0040	0.0011		W149246	AS	12/12/11 18:39	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W149246	AS	12/12/11 18:40	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W149246	AS	12/12/11 18:40	
EPA 200.7	Potassium	0.74	mg/L	0.50	0.07		W149246	AS	12/12/11 18:39	
EPA 200.7	Silicon	4.36	mg/L	0.08	0.03		W149246	AS	12/12/11 18:39	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0005		W149246	AS	12/12/11 18:40	
EPA 200.7	Sodium	3.81	mg/L	0.50	0.04		W149246	AS	12/12/11 18:39	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W149246	AS	12/12/11 18:40	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W149246	AS	12/12/11 18:40	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0021		W149246	AS	12/12/11 18:40	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00007		W149270	KWH	12/07/11 11:54	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0005		W149270	KWH	12/07/11 11:54	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00056		W149270	KWH	12/07/11 11:54	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000012		W149270	KWH	12/07/11 11:54	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0009		W149305	CFF	12/02/11 13:20	
EPA 120.1	Specific conductance	40.3	µmhos/cm	5.00			W149329	JMS	12/05/11 08:12	
EPA 180.1	Turbidity	93.0	NTU	0.500		5	W149308	SM	12/01/11 15:57	D2,H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0024		W149301	CFF	12/02/11 12:52	
EPA 350.1	Ammonia as N	0.259	mg/L	0.030	0.009		W149298	RHW	12/06/11 10:15	
EPA 353.2	Nitrate/Nitrite as N	0.384	mg/L	0.050	0.015		W150178	RHW	12/08/11 11:20	
EPA 410.4	Chemical Oxygen Demand	17.8	mg/L	5.0	2.1		W150044	SM	12/06/11 11:22	
SM 2320B/2310B	Bicarbonate	8.2	mg/L	1.0	0.5		W149271	DKS	12/01/11 13:24	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.5		W149271	DKS	12/01/11 13:24	
SM 2320B/2310B	Total Alkalinity	8.2	mg/L	1.0	0.5		W149271	DKS	12/01/11 13:24	
SM 2540 C	Total Diss. Solids	80	mg/L	10			W149262	RS	12/01/11 14:10	
SM 2540 D	Total Susp. Solids	27.0	mg/L	5.0			W149257	RS	12/01/11 14:10	
SM 4500 H B	pH @20.0°C	6.50	pH Units				W149271	DKS	12/01/11 13:24	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0013		W149302	CFF	12/02/11 13:50	
SM 4500-P-E	Phosphorus	0.181	mg/L	0.010	0.004		W149343	SM	12/05/11 16:57	
SM 5310B	Total Organic Carbon	6.45	mg/L	1.00	0.18		W150161	SM	12/07/11 21:24	



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

(208) 784-1258

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Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1K0622**

Reported: 16-Dec-11 10:39

Client Sample ID: **11242011SW018**

SVL Sample ID: **W1K0622-06 (Surface Water)**

Sample Report Page 3 of 3

Sampled: 24-Nov-11 13:50

Received: 30-Nov-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	5.19	mg/L	0.20	0.07		W150116	AEW	12/06/11 14:57	
EPA 300.0	Fluoride	< 0.10	mg/L	0.10	0.02		W150116	AEW	12/06/11 14:57	
EPA 300.0	Sulfate as SO4	1.03	mg/L	0.30	0.04		W150116	AEW	12/06/11 14:57	

Cation/Anion Balance and TDS Ratios

Cation Sum: 0.41 meq/L Anion Sum: 0.36 meq/L C/A Balance: 6.25 % Calculated TDS: 33 TDS/cTDS: 2.41 TDS/eC: 1.99

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: W1K0622

Reported: 16-Dec-11 10:39

Client Sample ID: 11242011SW019

SVL Sample ID: W1K0622-07 (Surface Water)

Sample Report Page 1 of 3

Sampled: 24-Nov-11 15:15

Received: 30-Nov-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W150236	DJA	12/09/11 14:23	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	1.56	mg/L	0.080	0.008		W149245	TJK	12/12/11 13:24	
EPA 200.7	Barium	0.0096	mg/L	0.0020	0.0002		W149245	TJK	12/12/11 13:25	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0002		W149245	TJK	12/12/11 13:24	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W149245	TJK	12/12/11 13:24	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0002		W149245	TJK	12/12/11 13:25	
EPA 200.7	Calcium	1.77	mg/L	0.040	0.006		W149245	TJK	12/12/11 13:24	
EPA 200.7	Chromium	0.0069	mg/L	0.0060	0.0003		W149245	TJK	12/12/11 13:25	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W149245	TJK	12/12/11 13:25	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.002		W149245	TJK	12/12/11 13:25	
EPA 200.7	Iron	8.02	mg/L	0.060	0.008		W149245	TJK	12/12/11 13:24	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0017		W149245	AS	12/12/11 16:48	
EPA 200.7	Magnesium	1.99	mg/L	0.060	0.010		W149245	TJK	12/12/11 13:24	
EPA 200.7	Manganese	0.0551	mg/L	0.0040	0.0006		W149245	TJK	12/12/11 13:24	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.0006		W149245	TJK	12/12/11 13:25	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W149245	TJK	12/12/11 13:25	
EPA 200.7	Potassium	1.23	mg/L	0.50	0.03		W149245	AS	12/12/11 16:46	
EPA 200.7	Silicon	4.61	mg/L	0.08	0.01		W149245	TJK	12/12/11 13:24	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0003		W149245	TJK	12/12/11 13:25	
EPA 200.7	Sodium	4.38	mg/L	0.50	0.02		W149245	AS	12/12/11 16:46	
EPA 200.7	Titanium	0.0151	mg/L	0.0050	0.0002		W149245	TJK	12/12/11 13:25	
EPA 200.7	Vanadium	0.0060	mg/L	0.0050	0.0002		W149245	TJK	12/12/11 13:25	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0010		W149245	TJK	12/12/11 13:25	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00009	2.5	W149249	KWH	12/06/11 10:44	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0006	2.5	W149249	KWH	12/06/11 10:44	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00070	2.5	W149249	KWH	12/06/11 10:44	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000015	2.5	W149249	KWH	12/06/11 10:44	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000011	2.5	W149249	KWH	12/06/11 10:44	
SM 2340B	Hardness (as CaCO3)	12.6	mg/L	0.347	0.058		N/A		12/12/11 13:24	



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1K0622**

Reported: 16-Dec-11 10:39

Client Sample ID: **11242011SW019**

Sampled: 24-Nov-11 15:15

SVL Sample ID: **W1K0622-07 (Surface Water)**

Received: 30-Nov-11

Sample Report Page 2 of 3

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Dissolved)

EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.016		W149246	AS	12/12/11 18:57	
EPA 200.7	Barium	0.0045	mg/L	0.0020	0.0004		W149246	AS	12/12/11 18:58	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0004		W149246	AS	12/12/11 18:57	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W149246	AS	12/12/11 18:57	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W149246	AS	12/12/11 18:58	
EPA 200.7	Calcium	1.72	mg/L	0.040	0.012		W149246	AS	12/12/11 18:56	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W149246	AS	12/12/11 18:58	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W149246	AS	12/12/11 18:58	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.003		W149246	AS	12/12/11 18:58	
EPA 200.7	Iron	0.636	mg/L	0.060	0.017		W149246	AS	12/12/11 18:57	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0034		W149246	AS	12/12/11 18:58	
EPA 200.7	Magnesium	1.76	mg/L	0.060	0.021		W149246	AS	12/12/11 18:57	
EPA 200.7	Manganese	0.0409	mg/L	0.0040	0.0011		W149246	AS	12/12/11 18:57	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W149246	AS	12/12/11 18:58	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W149246	AS	12/12/11 18:58	
EPA 200.7	Potassium	1.17	mg/L	0.50	0.07		W149246	AS	12/12/11 18:56	
EPA 200.7	Silicon	3.13	mg/L	0.08	0.03		W149246	AS	12/12/11 18:57	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0005		W149246	AS	12/12/11 18:58	
EPA 200.7	Sodium	4.35	mg/L	0.50	0.04		W149246	AS	12/12/11 18:56	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W149246	AS	12/12/11 18:58	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W149246	AS	12/12/11 18:58	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0021		W149246	AS	12/12/11 18:58	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00007		W149270	KWH	12/07/11 11:55	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0005		W149270	KWH	12/07/11 11:55	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00056		W149270	KWH	12/07/11 11:55	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000012		W149270	KWH	12/07/11 11:55	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0009		W149305	CFF	12/02/11 13:22	
EPA 120.1	Specific conductance	53.6	µmhos/cm	5.00			W149329	JMS	12/05/11 08:12	
EPA 180.1	Turbidity	168	NTU	0.500		5	W149308	SM	12/01/11 15:57	D2,H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0024		W149301	CFF	12/02/11 12:54	
EPA 350.1	Ammonia as N	0.393	mg/L	0.030	0.009		W149298	RHW	12/06/11 10:16	
EPA 353.2	Nitrate/Nitrite as N	0.161	mg/L	0.050	0.015		W150178	RHW	12/08/11 12:10	
EPA 410.4	Chemical Oxygen Demand	21.5	mg/L	5.0	2.1		W150044	SM	12/06/11 11:22	
SM 2320B/2310B	Bicarbonate	11.4	mg/L	1.0	0.5		W149271	DKS	12/01/11 13:32	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.5		W149271	DKS	12/01/11 13:32	
SM 2320B/2310B	Total Alkalinity	11.4	mg/L	1.0	0.5		W149271	DKS	12/01/11 13:32	
SM 2540 C	Total Diss. Solids	94	mg/L	10			W149262	RS	12/01/11 14:10	
SM 2540 D	Total Susp. Solids	34.0	mg/L	10.0			W149354	RS	12/02/11 11:53	H6
SM 4500 H B	pH @21.0°C	6.72	pH Units				W149271	DKS	12/01/11 13:32	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0013		W149302	CFF	12/02/11 13:52	
SM 4500-P-E	Phosphorus	0.037	mg/L	0.010	0.004		W149343	SM	12/05/11 16:57	
SM 5310B	Total Organic Carbon	6.61	mg/L	1.00	0.18		W150161	SM	12/07/11 21:35	



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

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Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1K0622**

Reported: 16-Dec-11 10:39

Client Sample ID: **11242011SW019**

SVL Sample ID: **W1K0622-07 (Surface Water)**

Sample Report Page 3 of 3

Sampled: 24-Nov-11 15:15

Received: 30-Nov-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	5.57	mg/L	0.20	0.07		W150116	AEW	12/06/11 15:24	
EPA 300.0	Fluoride	< 0.10	mg/L	0.10	0.02		W150116	AEW	12/06/11 15:24	
EPA 300.0	Sulfate as SO4	2.87	mg/L	0.30	0.04		W150116	AEW	12/06/11 15:24	

Cation/Anion Balance and TDS Ratios

Cation Sum: 0.50 meq/L Anion Sum: 0.46 meq/L C/A Balance: 4.86 % Calculated TDS: 36 TDS/cTDS: 2.64 TDS/eC: 1.75

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Golder Associates (WA)
 18300 NE Union Hill Road, Suite 200
 Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1K0622**

Reported: 16-Dec-11 10:39

Client Sample ID: **11242011SW119**

SVL Sample ID: **W1K0622-08 (Surface Water)**

Sample Report Page 1 of 3

Sampled: 24-Nov-11 15:15

Received: 30-Nov-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total)										
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W150236	DJA	12/09/11 14:24	
Metals (Total Recoverable--reportable as Total per 40 CFR 136)										
EPA 200.7	Aluminum	1.62	mg/L	0.080	0.008		W149245	TJK	12/12/11 13:30	
EPA 200.7	Barium	0.0095	mg/L	0.0020	0.0002		W149245	TJK	12/12/11 13:31	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0002		W149245	TJK	12/12/11 13:30	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W149245	TJK	12/12/11 13:30	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0002		W149245	TJK	12/12/11 13:31	
EPA 200.7	Calcium	1.77	mg/L	0.040	0.006		W149245	TJK	12/12/11 13:29	
EPA 200.7	Chromium	0.0075	mg/L	0.0060	0.0003		W149245	TJK	12/12/11 13:31	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W149245	TJK	12/12/11 13:31	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.002		W149245	TJK	12/12/11 13:31	
EPA 200.7	Iron	8.46	mg/L	0.060	0.008		W149245	TJK	12/12/11 13:29	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0017		W149245	AS	12/12/11 16:53	
EPA 200.7	Magnesium	1.95	mg/L	0.060	0.010		W149245	TJK	12/12/11 13:30	
EPA 200.7	Manganese	0.0543	mg/L	0.0040	0.0006		W149245	TJK	12/12/11 13:30	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.0006		W149245	TJK	12/12/11 13:31	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W149245	TJK	12/12/11 13:31	
EPA 200.7	Potassium	1.22	mg/L	0.50	0.03		W149245	AS	12/12/11 16:51	
EPA 200.7	Silicon	4.57	mg/L	0.08	0.01		W149245	TJK	12/12/11 13:30	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0003		W149245	TJK	12/12/11 13:31	
EPA 200.7	Sodium	4.35	mg/L	0.50	0.02		W149245	AS	12/12/11 16:51	
EPA 200.7	Titanium	0.0180	mg/L	0.0050	0.0002		W149245	TJK	12/12/11 13:31	
EPA 200.7	Vanadium	0.0064	mg/L	0.0050	0.0002		W149245	TJK	12/12/11 13:31	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0010		W149245	TJK	12/12/11 13:31	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00009	2.5	W149249	KWH	12/06/11 10:45	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0006	2.5	W149249	KWH	12/06/11 10:45	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00070	2.5	W149249	KWH	12/06/11 10:45	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000015	2.5	W149249	KWH	12/06/11 10:45	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000011	2.5	W149249	KWH	12/06/11 10:45	
SM 2340B	Hardness (as CaCO3)	12.5	mg/L	0.347	0.058		N/A		12/12/11 13:30	



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1K0622**

Reported: 16-Dec-11 10:39

Client Sample ID: **11242011SW119**

Sampled: 24-Nov-11 15:15

SVL Sample ID: **W1K0622-08 (Surface Water)**

Received: 30-Nov-11

Sample Report Page 2 of 3

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Dissolved)

EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.016		W149246	AS	12/12/11 19:03	
EPA 200.7	Barium	0.0045	mg/L	0.0020	0.0004		W149246	AS	12/12/11 19:04	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0004		W149246	AS	12/12/11 19:03	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W149246	AS	12/12/11 19:03	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W149246	AS	12/12/11 19:04	
EPA 200.7	Calcium	1.74	mg/L	0.040	0.012		W149246	AS	12/12/11 19:02	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W149246	AS	12/12/11 19:04	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W149246	AS	12/12/11 19:04	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.003		W149246	AS	12/12/11 19:04	
EPA 200.7	Iron	0.779	mg/L	0.060	0.017		W149246	AS	12/12/11 19:03	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0034		W149246	AS	12/12/11 19:04	
EPA 200.7	Magnesium	1.78	mg/L	0.060	0.021		W149246	AS	12/12/11 19:03	
EPA 200.7	Manganese	0.0410	mg/L	0.0040	0.0011		W149246	AS	12/12/11 19:03	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W149246	AS	12/12/11 19:04	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W149246	AS	12/12/11 19:04	
EPA 200.7	Potassium	1.17	mg/L	0.50	0.07		W149246	AS	12/12/11 19:02	
EPA 200.7	Silicon	3.17	mg/L	0.08	0.03		W149246	AS	12/12/11 19:03	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0005		W149246	AS	12/12/11 19:04	
EPA 200.7	Sodium	4.39	mg/L	0.50	0.04		W149246	AS	12/12/11 19:02	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W149246	AS	12/12/11 19:04	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W149246	AS	12/12/11 19:04	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0021		W149246	AS	12/12/11 19:04	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00007		W149270	KWH	12/07/11 11:57	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0005		W149270	KWH	12/07/11 11:57	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00056		W149270	KWH	12/07/11 11:57	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000012		W149270	KWH	12/07/11 11:57	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0009		W149305	CFF	12/02/11 13:24	
EPA 120.1	Specific conductance	53.9	µmhos/cm	5.00			W149329	JMS	12/05/11 08:12	
EPA 180.1	Turbidity	174	NTU	0.500		5	W149308	SM	12/01/11 15:57	D2,H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0024		W149301	CFF	12/02/11 12:56	
EPA 350.1	Ammonia as N	0.408	mg/L	0.030	0.009		W149298	RHW	12/06/11 10:18	
EPA 353.2	Nitrate/Nitrite as N	0.215	mg/L	0.050	0.015		W150178	RHW	12/08/11 12:12	
EPA 410.4	Chemical Oxygen Demand	26.3	mg/L	5.0	2.1		W150044	SM	12/06/11 11:22	
SM 2320B/2310B	Bicarbonate	11.6	mg/L	1.0	0.5		W149271	DKS	12/01/11 13:42	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.5		W149271	DKS	12/01/11 13:42	
SM 2320B/2310B	Total Alkalinity	11.6	mg/L	1.0	0.5		W149271	DKS	12/01/11 13:42	
SM 2540 C	Total Diss. Solids	73	mg/L	10			W149262	RS	12/01/11 14:10	
SM 2540 D	Total Susp. Solids	70.0	mg/L	5.0			W149257	RS	12/01/11 14:10	
SM 4500 H B	pH @21.0°C	6.76	pH Units				W149271	DKS	12/01/11 13:42	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0013		W149302	CFF	12/02/11 13:54	
SM 4500-P-E	Phosphorus	0.042	mg/L	0.010	0.004		W149343	SM	12/05/11 16:57	
SM 5310B	Total Organic Carbon	6.85	mg/L	1.00	0.18		W150161	SM	12/07/11 21:47	



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

(208) 784-1258

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Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1K0622**

Reported: 16-Dec-11 10:39

Client Sample ID: **11242011SW119**

SVL Sample ID: **W1K0622-08 (Surface Water)**

Sample Report Page 3 of 3

Sampled: 24-Nov-11 15:15

Received: 30-Nov-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	5.65	mg/L	0.20	0.07		W150116	AEW	12/06/11 15:33	
EPA 300.0	Fluoride	< 0.10	mg/L	0.10	0.02		W150116	AEW	12/06/11 15:33	
EPA 300.0	Sulfate as SO4	2.77	mg/L	0.30	0.04		W150116	AEW	12/06/11 15:33	

Cation/Anion Balance and TDS Ratios

Cation Sum: 0.51 meq/L Anion Sum: 0.47 meq/L C/A Balance: 4.86 % Calculated TDS: 36 TDS/cTDS: 2.03 TDS/eC: 1.35

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Golder Associates (WA)
 18300 NE Union Hill Road, Suite 200
 Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1K0622**

Reported: 16-Dec-11 10:39

Client Sample ID: **11252011SW020**

SVL Sample ID: **W1K0622-09 (Surface Water)**

Sample Report Page 1 of 3

Sampled: 25-Nov-11 09:30

Received: 30-Nov-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W150236	DJA	12/09/11 14:26	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	4.79	mg/L	0.080	0.008		W149245	TJK	12/12/11 13:35	
EPA 200.7	Barium	0.0165	mg/L	0.0020	0.0002		W149245	TJK	12/12/11 13:37	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0002		W149245	TJK	12/12/11 13:35	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W149245	TJK	12/12/11 13:35	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0002		W149245	TJK	12/12/11 13:37	
EPA 200.7	Calcium	0.922	mg/L	0.040	0.006		W149245	TJK	12/12/11 13:35	
EPA 200.7	Chromium	0.0193	mg/L	0.0060	0.0003		W149245	TJK	12/12/11 13:36	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W149245	TJK	12/12/11 13:37	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.002		W149245	TJK	12/12/11 13:36	
EPA 200.7	Iron	10.1	mg/L	0.060	0.008		W149245	TJK	12/12/11 13:35	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0017		W149245	AS	12/12/11 17:05	
EPA 200.7	Magnesium	1.43	mg/L	0.060	0.010		W149245	TJK	12/12/11 13:35	
EPA 200.7	Manganese	0.0510	mg/L	0.0040	0.0006		W149245	TJK	12/12/11 13:35	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.0006		W149245	TJK	12/12/11 13:37	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W149245	TJK	12/12/11 13:36	
EPA 200.7	Potassium	0.86	mg/L	0.50	0.03		W149245	AS	12/12/11 17:03	
EPA 200.7	Silicon	7.76	mg/L	0.08	0.01		W149245	TJK	12/12/11 13:35	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0003		W149245	TJK	12/12/11 13:36	
EPA 200.7	Sodium	3.20	mg/L	0.50	0.02		W149245	AS	12/12/11 17:03	
EPA 200.7	Titanium	0.0158	mg/L	0.0050	0.0002		W149245	TJK	12/12/11 13:36	
EPA 200.7	Vanadium	0.0128	mg/L	0.0050	0.0002		W149245	TJK	12/12/11 13:36	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0010		W149245	TJK	12/12/11 13:37	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00009	2.5	W149249	KWH	12/06/11 10:47	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0006	2.5	W149249	KWH	12/06/11 10:47	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00070	2.5	W149249	KWH	12/06/11 10:47	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000015	2.5	W149249	KWH	12/06/11 10:47	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000011	2.5	W149249	KWH	12/06/11 10:47	
SM 2340B	Hardness (as CaCO3)	8.20	mg/L	0.347	0.058		N/A		12/12/11 13:35	



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1K0622**

Reported: 16-Dec-11 10:39

Client Sample ID: **11252011SW020**

Sampled: 25-Nov-11 09:30

SVL Sample ID: **W1K0622-09 (Surface Water)**

Received: 30-Nov-11

Sample Report Page 2 of 3

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Dissolved)

EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.016		W149246	AS	12/12/11 19:08	
EPA 200.7	Barium	0.0036	mg/L	0.0020	0.0004		W149246	AS	12/12/11 19:10	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0004		W149246	AS	12/12/11 19:08	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W149246	AS	12/12/11 19:08	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W149246	AS	12/12/11 19:10	
EPA 200.7	Calcium	0.823	mg/L	0.040	0.012		W149246	AS	12/12/11 19:08	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W149246	AS	12/12/11 19:10	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W149246	AS	12/12/11 19:10	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.003		W149246	AS	12/12/11 19:09	
EPA 200.7	Iron	0.672	mg/L	0.060	0.017		W149246	AS	12/12/11 19:08	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0034		W149246	AS	12/12/11 19:10	
EPA 200.7	Magnesium	1.11	mg/L	0.060	0.021		W149246	AS	12/12/11 19:08	
EPA 200.7	Manganese	0.0321	mg/L	0.0040	0.0011		W149246	AS	12/12/11 19:08	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W149246	AS	12/12/11 19:10	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W149246	AS	12/12/11 19:10	
EPA 200.7	Potassium	0.70	mg/L	0.50	0.07		W149246	AS	12/12/11 19:08	
EPA 200.7	Silicon	3.76	mg/L	0.08	0.03		W149246	AS	12/12/11 19:08	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0005		W149246	AS	12/12/11 19:09	
EPA 200.7	Sodium	3.23	mg/L	0.50	0.04		W149246	AS	12/12/11 19:08	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W149246	AS	12/12/11 19:10	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W149246	AS	12/12/11 19:09	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0021		W149246	AS	12/12/11 19:10	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00007		W149270	KWH	12/07/11 11:58	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0005		W149270	KWH	12/07/11 11:58	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00056		W149270	KWH	12/07/11 11:58	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000012		W149270	KWH	12/07/11 11:58	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0009		W149305	CFF	12/02/11 13:32	
EPA 120.1	Specific conductance	32.7	µmhos/cm	5.00			W149329	JMS	12/05/11 08:12	
EPA 180.1	Turbidity	336	NTU	1.00		10	W149308	SM	12/01/11 15:57	D2,H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0024		W149301	CFF	12/02/11 12:58	
EPA 350.1	Ammonia as N	0.103	mg/L	0.030	0.009		W149298	RHW	12/06/11 10:19	
EPA 353.2	Nitrate/Nitrite as N	0.380	mg/L	0.050	0.015		W150180	RHW	12/08/11 10:58	
EPA 410.4	Chemical Oxygen Demand	25.1	mg/L	5.0	2.1		W150044	SM	12/06/11 11:22	
SM 2320B/2310B	Bicarbonate	5.8	mg/L	1.0	0.5		W149271	DKS	12/01/11 13:51	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.5		W149271	DKS	12/01/11 13:51	
SM 2320B/2310B	Total Alkalinity	5.8	mg/L	1.0	0.5		W149271	DKS	12/01/11 13:51	
SM 2540 C	Total Diss. Solids	86	mg/L	10			W149262	RS	12/01/11 14:10	
SM 2540 D	Total Susp. Solids	201	mg/L	5.0			W149257	RS	12/01/11 14:10	
SM 4500 H B	pH @21.0°C	6.32	pH Units				W149271	DKS	12/01/11 13:51	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0013		W149302	CFF	12/02/11 14:02	
SM 4500-P-E	Phosphorus	0.112	mg/L	0.010	0.004		W149343	SM	12/05/11 16:57	
SM 5310B	Total Organic Carbon	6.48	mg/L	1.00	0.18		W150161	SM	12/07/11 21:58	



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

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Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1K0622**

Reported: 16-Dec-11 10:39

Client Sample ID: **11252011SW020**

SVL Sample ID: **W1K0622-09 (Surface Water)**

Sample Report Page 3 of 3

Sampled: 25-Nov-11 09:30

Received: 30-Nov-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	4.57	mg/L	0.20	0.07		W150116	AEW	12/06/11 15:42	
EPA 300.0	Fluoride	< 0.10	mg/L	0.10	0.02		W150116	AEW	12/06/11 15:42	
EPA 300.0	Sulfate as SO4	0.94	mg/L	0.30	0.04		W150116	AEW	12/06/11 15:42	

Cation/Anion Balance and TDS Ratios

Cation Sum: 0.32 meq/L Anion Sum: 0.29 meq/L C/A Balance: 5.07 % Calculated TDS: 32 TDS/cTDS: 2.65 TDS/eC: 2.63

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: **Suriname - Merian Gold 2011 / 113-93245**

Work Order: **W1K0622**

Reported: 16-Dec-11 10:39

Client Sample ID: **11252011SW120**

SVL Sample ID: **W1K0622-10 (Surface Water)**

Sample Report Page 1 of 3

Sampled: 25-Nov-11 09:30

Received: 30-Nov-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W150236	DJA	12/09/11 14:28	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	4.91	mg/L	0.080	0.008		W149245	TJK	12/12/11 13:41	
EPA 200.7	Barium	0.0167	mg/L	0.0020	0.0002		W149245	TJK	12/12/11 13:42	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0002		W149245	TJK	12/12/11 13:41	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W149245	TJK	12/12/11 13:41	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0002		W149245	TJK	12/12/11 13:42	
EPA 200.7	Calcium	0.922	mg/L	0.040	0.006		W149245	TJK	12/12/11 13:41	
EPA 200.7	Chromium	0.0198	mg/L	0.0060	0.0003		W149245	TJK	12/12/11 13:42	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W149245	TJK	12/12/11 13:42	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.002		W149245	TJK	12/12/11 13:42	
EPA 200.7	Iron	10.3	mg/L	0.060	0.008		W149245	TJK	12/12/11 13:40	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0017		W149245	AS	12/12/11 17:10	
EPA 200.7	Magnesium	1.43	mg/L	0.060	0.010		W149245	TJK	12/12/11 13:41	
EPA 200.7	Manganese	0.0515	mg/L	0.0040	0.0006		W149245	TJK	12/12/11 13:41	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.0006		W149245	TJK	12/12/11 13:42	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W149245	TJK	12/12/11 13:42	
EPA 200.7	Potassium	0.85	mg/L	0.50	0.03		W149245	AS	12/12/11 17:08	
EPA 200.7	Silicon	7.87	mg/L	0.08	0.01		W149245	TJK	12/12/11 13:41	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0003		W149245	TJK	12/12/11 13:42	
EPA 200.7	Sodium	3.22	mg/L	0.50	0.02		W149245	AS	12/12/11 17:08	
EPA 200.7	Titanium	0.0156	mg/L	0.0050	0.0002		W149245	TJK	12/12/11 13:42	
EPA 200.7	Vanadium	0.0132	mg/L	0.0050	0.0002		W149245	TJK	12/12/11 13:42	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0010		W149245	TJK	12/12/11 13:42	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00009	2.5	W149249	KWH	12/06/11 10:48	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0006	2.5	W149249	KWH	12/06/11 10:48	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00070	2.5	W149249	KWH	12/06/11 10:48	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000015	2.5	W149249	KWH	12/06/11 10:48	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000011	2.5	W149249	KWH	12/06/11 10:48	
SM 2340B	Hardness (as CaCO3)	8.19	mg/L	0.347	0.058		N/A		12/12/11 13:41	



Golder Associates (WA)
 18300 NE Union Hill Road, Suite 200
 Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1K0622**

Reported: 16-Dec-11 10:39

Client Sample ID: **11252011SW120**

Sampled: 25-Nov-11 09:30

SVL Sample ID: **W1K0622-10 (Surface Water)**

Received: 30-Nov-11

Sample Report Page 2 of 3

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Dissolved)

EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.016		W149246	AS	12/12/11 19:14	
EPA 200.7	Barium	0.0037	mg/L	0.0020	0.0004		W149246	AS	12/12/11 19:16	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0004		W149246	AS	12/12/11 19:14	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W149246	AS	12/12/11 19:14	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W149246	AS	12/12/11 19:16	
EPA 200.7	Calcium	0.842	mg/L	0.040	0.012		W149246	AS	12/12/11 19:14	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W149246	AS	12/12/11 19:16	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W149246	AS	12/12/11 19:16	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.003		W149246	AS	12/12/11 19:15	
EPA 200.7	Iron	0.724	mg/L	0.060	0.017		W149246	AS	12/12/11 19:14	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0034		W149246	AS	12/12/11 19:16	
EPA 200.7	Magnesium	1.11	mg/L	0.060	0.021		W149246	AS	12/12/11 19:14	
EPA 200.7	Manganese	0.0294	mg/L	0.0040	0.0011		W149246	AS	12/12/11 19:14	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W149246	AS	12/12/11 19:16	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W149246	AS	12/12/11 19:16	
EPA 200.7	Potassium	0.71	mg/L	0.50	0.07		W149246	AS	12/12/11 19:14	
EPA 200.7	Silicon	3.75	mg/L	0.08	0.03		W149246	AS	12/12/11 19:14	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0005		W149246	AS	12/12/11 19:15	
EPA 200.7	Sodium	3.25	mg/L	0.50	0.04		W149246	AS	12/12/11 19:14	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W149246	AS	12/12/11 19:16	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W149246	AS	12/12/11 19:15	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0021		W149246	AS	12/12/11 19:16	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00007		W149270	KWH	12/07/11 12:00	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0005		W149270	KWH	12/07/11 12:00	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00056		W149270	KWH	12/07/11 12:00	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000012		W149270	KWH	12/07/11 12:00	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0009		W149305	CFF	12/02/11 13:34	
EPA 120.1	Specific conductance	32.6	µmhos/cm	5.00			W149329	JMS	12/05/11 08:12	
EPA 180.1	Turbidity	408	NTU	2.50		25	W149308	SM	12/01/11 15:57	D2,H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0024		W149301	CFF	12/02/11 13:00	
EPA 350.1	Ammonia as N	0.166	mg/L	0.030	0.009		W149298	RHW	12/06/11 10:20	
EPA 353.2	Nitrate/Nitrite as N	0.430	mg/L	0.050	0.015		W150180	RHW	12/08/11 10:59	
EPA 410.4	Chemical Oxygen Demand	24.0	mg/L	5.0	2.1		W150044	SM	12/06/11 11:22	
SM 2320B/2310B	Bicarbonate	5.8	mg/L	1.0	0.5		W149271	DKS	12/01/11 13:58	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.5		W149271	DKS	12/01/11 13:58	
SM 2320B/2310B	Total Alkalinity	5.8	mg/L	1.0	0.5		W149271	DKS	12/01/11 13:58	
SM 2540 C	Total Diss. Solids	95	mg/L	10			W149262	RS	12/01/11 14:10	
SM 2540 D	Total Susp. Solids	189	mg/L	5.0			W149257	RS	12/01/11 14:10	
SM 4500 H B	pH @21.0°C	6.40	pH Units				W149271	DKS	12/01/11 13:58	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0013		W149302	CFF	12/02/11 14:04	
SM 4500-P-E	Phosphorus	0.091	mg/L	0.010	0.004		W149343	SM	12/05/11 16:57	
SM 5310B	Total Organic Carbon	7.92	mg/L	1.00	0.18		W150161	SM	12/07/11 22:09	



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

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Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1K0622**

Reported: 16-Dec-11 10:39

Client Sample ID: **11252011SW120**

SVL Sample ID: **W1K0622-10 (Surface Water)**

Sample Report Page 3 of 3

Sampled: 25-Nov-11 09:30

Received: 30-Nov-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	4.50	mg/L	0.20	0.07		W150116	AEW	12/06/11 15:52	
EPA 300.0	Fluoride	< 0.10	mg/L	0.10	0.02		W150116	AEW	12/06/11 15:52	
EPA 300.0	Sulfate as SO4	0.99	mg/L	0.30	0.04		W150116	AEW	12/06/11 15:52	

Cation/Anion Balance and TDS Ratios

Cation Sum: 0.33 meq/L Anion Sum: 0.30 meq/L C/A Balance: 5.89 % Calculated TDS: 33 TDS/cTDS: 2.90 TDS/eC: 2.91

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: W1K0622

Reported: 16-Dec-11 10:39

Client Sample ID: 11262011SW021

SVL Sample ID: W1K0622-11 (Surface Water)

Sample Report Page 1 of 3

Sampled: 26-Nov-11 10:45
Received: 30-Nov-11
Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W150236	DJA	12/09/11 14:33	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	4.26	mg/L	0.080	0.008		W149245	TJK	12/12/11 13:46	
EPA 200.7	Barium	0.0287	mg/L	0.0020	0.0002		W149245	TJK	12/12/11 13:48	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0002		W149245	TJK	12/12/11 13:46	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W149245	TJK	12/12/11 13:46	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0002		W149245	TJK	12/12/11 13:48	
EPA 200.7	Calcium	0.430	mg/L	0.040	0.006		W149245	TJK	12/12/11 13:46	
EPA 200.7	Chromium	0.0230	mg/L	0.0060	0.0003		W149245	TJK	12/12/11 13:47	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W149245	TJK	12/12/11 13:48	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.002		W149245	TJK	12/12/11 13:47	
EPA 200.7	Iron	6.74	mg/L	0.060	0.008		W149245	TJK	12/12/11 13:46	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0017		W149245	AS	12/12/11 17:15	
EPA 200.7	Magnesium	1.00	mg/L	0.060	0.010		W149245	TJK	12/12/11 13:46	
EPA 200.7	Manganese	0.0307	mg/L	0.0040	0.0006		W149245	TJK	12/12/11 13:46	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.0006		W149245	TJK	12/12/11 13:48	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W149245	TJK	12/12/11 13:48	
EPA 200.7	Potassium	0.69	mg/L	0.50	0.03		W149245	AS	12/12/11 17:14	
EPA 200.7	Silicon	7.54	mg/L	0.08	0.01		W149245	TJK	12/12/11 13:46	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0003		W149245	TJK	12/12/11 13:47	
EPA 200.7	Sodium	2.62	mg/L	0.50	0.02		W149245	AS	12/12/11 17:14	
EPA 200.7	Titanium	0.0158	mg/L	0.0050	0.0002		W149245	TJK	12/12/11 13:47	
EPA 200.7	Vanadium	0.0108	mg/L	0.0050	0.0002		W149245	TJK	12/12/11 13:47	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0010		W149245	TJK	12/12/11 13:48	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00009	2.5	W149249	KWH	12/06/11 10:50	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0006	2.5	W149249	KWH	12/06/11 10:50	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00070	2.5	W149249	KWH	12/06/11 10:50	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000015	2.5	W149249	KWH	12/06/11 10:50	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000011	2.5	W149249	KWH	12/06/11 10:50	
SM 2340B	Hardness (as CaCO3)	5.20	mg/L	0.347	0.058		N/A		12/12/11 13:46	



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1K0622**

Reported: 16-Dec-11 10:39

Client Sample ID: **11262011SW021**

Sampled: 26-Nov-11 10:45

SVL Sample ID: **W1K0622-11 (Surface Water)**

Received: 30-Nov-11

Sample Report Page 2 of 3

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Dissolved)

EPA 200.7	Aluminum	0.096	mg/L	0.080	0.016		W149246	AS	12/12/11 19:20	
EPA 200.7	Barium	0.0033	mg/L	0.0020	0.0004		W149246	AS	12/12/11 19:21	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0004		W149246	AS	12/12/11 19:20	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W149246	AS	12/12/11 19:20	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W149246	AS	12/12/11 19:21	
EPA 200.7	Calcium	0.418	mg/L	0.040	0.012		W149246	AS	12/12/11 19:20	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W149246	AS	12/12/11 19:21	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W149246	AS	12/12/11 19:21	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.003		W149246	AS	12/12/11 19:21	
EPA 200.7	Iron	0.398	mg/L	0.060	0.017		W149246	AS	12/12/11 19:20	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0034		W149246	AS	12/12/11 19:21	
EPA 200.7	Magnesium	0.728	mg/L	0.060	0.021		W149246	AS	12/12/11 19:20	
EPA 200.7	Manganese	0.0135	mg/L	0.0040	0.0011		W149246	AS	12/12/11 19:20	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W149246	AS	12/12/11 19:21	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W149246	AS	12/12/11 19:21	
EPA 200.7	Potassium	< 0.50	mg/L	0.50	0.07		W149246	AS	12/12/11 19:19	
EPA 200.7	Silicon	4.11	mg/L	0.08	0.03		W149246	AS	12/12/11 19:20	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0005		W149246	AS	12/12/11 19:21	
EPA 200.7	Sodium	2.64	mg/L	0.50	0.04		W149246	AS	12/12/11 19:19	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W149246	AS	12/12/11 19:21	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W149246	AS	12/12/11 19:21	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0021		W149246	AS	12/12/11 19:21	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00007		W149270	KWH	12/07/11 12:01	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0005		W149270	KWH	12/07/11 12:01	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00056		W149270	KWH	12/07/11 12:01	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000012		W149270	KWH	12/07/11 12:01	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0009		W149305	CFF	12/02/11 13:36	
EPA 120.1	Specific conductance	23.5	µmhos/cm	5.00			W149329	JMS	12/05/11 08:12	
EPA 180.1	Turbidity	249	NTU	1.00		10	W149308	SM	12/01/11 15:57	D2,H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0024		W149301	CFF	12/02/11 13:02	
EPA 350.1	Ammonia as N	0.041	mg/L	0.030	0.009		W149298	RHW	12/06/11 10:22	
EPA 353.2	Nitrate/Nitrite as N	0.317	mg/L	0.050	0.015		W150180	RHW	12/08/11 11:00	
EPA 410.4	Chemical Oxygen Demand	25.0	mg/L	5.0	2.1		W150044	SM	12/06/11 11:22	
SM 2320B/2310B	Bicarbonate	2.5	mg/L	1.0	0.5		W149271	DKS	12/01/11 14:03	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.5		W149271	DKS	12/01/11 14:03	
SM 2320B/2310B	Total Alkalinity	2.5	mg/L	1.0	0.5		W149271	DKS	12/01/11 14:03	
SM 2540 C	Total Diss. Solids	83	mg/L	10			W149262	RS	12/01/11 14:10	
SM 2540 D	Total Susp. Solids	132	mg/L	5.0			W149257	RS	12/01/11 14:10	
SM 4500 H B	pH @21.0°C	5.89	pH Units				W149271	DKS	12/01/11 14:03	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0013		W149302	CFF	12/02/11 14:06	
SM 4500-P-E	Phosphorus	0.074	mg/L	0.010	0.004		W149343	SM	12/05/11 16:57	
SM 5310B	Total Organic Carbon	5.40	mg/L	1.00	0.18		W150160	SM	12/07/11 17:05	



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

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Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
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Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1K0622**

Reported: 16-Dec-11 10:39

Client Sample ID: **11262011SW021**

SVL Sample ID: **W1K0622-11 (Surface Water)**

Sample Report Page 3 of 3

Sampled: 26-Nov-11 10:45

Received: 30-Nov-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	4.42	mg/L	0.20	0.07		W150116	AEW	12/06/11 16:01	
EPA 300.0	Fluoride	< 0.10	mg/L	0.10	0.02		W150116	AEW	12/06/11 16:01	
EPA 300.0	Sulfate as SO4	0.50	mg/L	0.30	0.04		W150116	AEW	12/06/11 16:01	

Cation/Anion Balance and TDS Ratios

Cation Sum: 0.23 meq/L Anion Sum: 0.21 meq/L C/A Balance: 3.70 % Calculated TDS: 28 TDS/cTDS: 2.98 TDS/eC: 3.53

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: W1K0622

Reported: 16-Dec-11 10:39

Client Sample ID: 11262011SW221

SVL Sample ID: W1K0622-12 (Surface Water)

Sample Report Page 1 of 3

Sampled: 26-Nov-11 11:00

Received: 30-Nov-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	0.00038	mg/L	0.00020	0.000072		W150236	DJA	12/09/11 14:36	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.008		W149245	TJK	12/12/11 13:52	
EPA 200.7	Barium	0.0129	mg/L	0.0020	0.0002		W149245	TJK	12/12/11 13:53	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0002		W149245	TJK	12/12/11 13:52	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W149245	TJK	12/12/11 13:52	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0002		W149245	TJK	12/12/11 13:53	
EPA 200.7	Calcium	0.970	mg/L	0.040	0.006		W149245	TJK	12/12/11 13:52	
EPA 200.7	Chromium	0.0066	mg/L	0.0060	0.0003		W149245	TJK	12/12/11 13:53	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W149245	TJK	12/12/11 13:53	
EPA 200.7	Copper	0.118	mg/L	0.010	0.002		W149245	TJK	12/12/11 13:53	
EPA 200.7	Iron	< 0.060	mg/L	0.060	0.008		W149245	TJK	12/12/11 13:52	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0017		W149245	AS	12/12/11 17:21	
EPA 200.7	Magnesium	0.213	mg/L	0.060	0.010		W149245	TJK	12/12/11 13:52	
EPA 200.7	Manganese	0.0056	mg/L	0.0040	0.0006		W149245	TJK	12/12/11 13:52	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.0006		W149245	TJK	12/12/11 13:53	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W149245	TJK	12/12/11 13:53	
EPA 200.7	Potassium	0.53	mg/L	0.50	0.03		W149245	AS	12/12/11 17:19	
EPA 200.7	Silicon	0.25	mg/L	0.08	0.01		W149245	TJK	12/12/11 13:52	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0003		W149245	TJK	12/12/11 13:53	
EPA 200.7	Sodium	1.23	mg/L	0.50	0.02		W149245	AS	12/12/11 17:19	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0002		W149245	TJK	12/12/11 13:53	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0002		W149245	TJK	12/12/11 13:53	
EPA 200.7	Zinc	0.427	mg/L	0.0100	0.0010		W149245	TJK	12/12/11 13:53	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00009	2.5	W149249	KWH	12/06/11 10:51	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0006	2.5	W149249	KWH	12/06/11 10:51	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00070	2.5	W149249	KWH	12/06/11 10:51	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000015	2.5	W149249	KWH	12/06/11 10:51	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000011	2.5	W149249	KWH	12/06/11 10:51	
SM 2340B	Hardness (as CaCO3)	3.30	mg/L	0.347	0.058		N/A		12/12/11 13:52	



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1K0622**

Reported: 16-Dec-11 10:39

Client Sample ID: **11262011SW221**

Sampled: 26-Nov-11 11:00

SVL Sample ID: **W1K0622-12 (Surface Water)**

Received: 30-Nov-11

Sample Report Page 2 of 3

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.016		W149246	AS	12/12/11 19:32	
EPA 200.7	Barium	0.0127	mg/L	0.0020	0.0004		W149246	AS	12/12/11 19:33	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0004		W149246	AS	12/12/11 19:32	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W149246	AS	12/12/11 19:32	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W149246	AS	12/12/11 19:33	
EPA 200.7	Calcium	1.03	mg/L	0.040	0.012		W149246	AS	12/12/11 19:32	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W149246	AS	12/12/11 19:33	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W149246	AS	12/12/11 19:33	
EPA 200.7	Copper	0.136	mg/L	0.010	0.003		W149246	AS	12/12/11 19:33	
EPA 200.7	Iron	< 0.060	mg/L	0.060	0.017		W149246	AS	12/12/11 19:32	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0034		W149246	AS	12/12/11 19:33	
EPA 200.7	Magnesium	0.213	mg/L	0.060	0.021		W149246	AS	12/12/11 19:32	
EPA 200.7	Manganese	0.0071	mg/L	0.0040	0.0011		W149246	AS	12/12/11 19:32	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W149246	AS	12/12/11 19:33	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W149246	AS	12/12/11 19:33	
EPA 200.7	Potassium	0.55	mg/L	0.50	0.07		W149246	AS	12/12/11 19:31	
EPA 200.7	Silicon	0.20	mg/L	0.08	0.03		W149246	AS	12/12/11 19:32	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0005		W149246	AS	12/12/11 19:33	
EPA 200.7	Sodium	1.38	mg/L	0.50	0.04		W149246	AS	12/12/11 19:31	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W149246	AS	12/12/11 19:33	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W149246	AS	12/12/11 19:33	
EPA 200.7	Zinc	0.447	mg/L	0.0100	0.0021		W149246	AS	12/12/11 19:33	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00007		W149270	KWH	12/07/11 12:03	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0005		W149270	KWH	12/07/11 12:03	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00056		W149270	KWH	12/07/11 12:03	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000012		W149270	KWH	12/07/11 12:03	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0009		W149305	CFF	12/02/11 13:38	
EPA 120.1	Specific conductance	18.7	µmhos/cm	5.00			W149329	JMS	12/05/11 08:12	
EPA 180.1	Turbidity	0.122	NTU	0.100			W149308	SM	12/01/11 15:57	H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0024		W149301	CFF	12/02/11 13:10	
EPA 350.1	Ammonia as N	< 0.030	mg/L	0.030	0.009		W149298	RHW	12/06/11 10:23	
EPA 353.2	Nitrate/Nitrite as N	0.450	mg/L	0.050	0.015		W150180	RHW	12/08/11 11:01	
EPA 410.4	Chemical Oxygen Demand	< 5.0	mg/L	5.0	2.1		W150044	SM	12/06/11 11:22	
SM 2320B/2310B	Bicarbonate	2.5	mg/L	1.0	0.5		W149271	DKS	12/01/11 14:08	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.5		W149271	DKS	12/01/11 14:08	
SM 2320B/2310B	Total Alkalinity	2.5	mg/L	1.0	0.5		W149271	DKS	12/01/11 14:08	
SM 2540 C	Total Diss. Solids	12	mg/L	10			W149262	RS	12/01/11 14:10	
SM 2540 D	Total Susp. Solids	< 5.0	mg/L	5.0			W149257	RS	12/01/11 14:10	
SM 4500 H B	pH @21.0°C	6.19	pH Units				W149271	DKS	12/01/11 14:08	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0013		W149302	CFF	12/02/11 14:08	
SM 4500-P-E	Phosphorus	< 0.010	mg/L	0.010	0.004		W149343	SM	12/05/11 16:57	
SM 5310B	Total Organic Carbon	< 1.00	mg/L	1.00	0.18		W150160	SM	12/07/11 17:15	



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

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Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1K0622**

Reported: 16-Dec-11 10:39

Client Sample ID: **11262011SW221**

SVL Sample ID: **W1K0622-12 (Surface Water)**

Sample Report Page 3 of 3

Sampled: 26-Nov-11 11:00

Received: 30-Nov-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	2.70	mg/L	0.20	0.07		W150116	AEW	12/06/11 16:19	
EPA 300.0	Fluoride	< 0.10	mg/L	0.10	0.02		W150116	AEW	12/06/11 16:19	
EPA 300.0	Sulfate as SO4	0.75	mg/L	0.30	0.04		W150116	AEW	12/06/11 16:19	

Cation/Anion Balance and TDS Ratios

Cation Sum: 0.15 meq/L Anion Sum: 0.18 meq/L C/A Balance: -7.04 % Calculated TDS: 11 TDS/cTDS: 1.13 TDS/eC: 0.64

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

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Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1K0622**

Reported: 16-Dec-11 10:39

Client Sample ID: **11262011SW022**

SVL Sample ID: **W1K0622-13 (Surface Water)**

Sample Report Page 1 of 1

Sampled: 26-Nov-11 14:00

Received: 30-Nov-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0009		W149305	CFE	12/02/11 13:40	
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0024		W149301	CFE	12/02/11 13:12	
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0013		W149302	CFE	12/02/11 14:10	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



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Kellogg ID 83837-0929

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Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1K0622**

Reported: 16-Dec-11 10:39

Client Sample ID: **11262011SW023**

SVL Sample ID: **W1K0622-14 (Surface Water)**

Sample Report Page 1 of 1

Sampled: 26-Nov-11 14:15

Received: 30-Nov-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0009		W149305	CFE	12/02/11 13:42	
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0024		W149301	CFE	12/02/11 13:14	
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0013		W149302	CFE	12/02/11 14:12	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



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Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1K0622**

Reported: 16-Dec-11 10:39

Client Sample ID: **11262011SW024**

SVL Sample ID: **W1K0622-15 (Surface Water)**

Sample Report Page 1 of 1

Sampled: 26-Nov-11 14:30

Received: 30-Nov-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0009		W149305	CFE	12/02/11 13:44	
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0024		W149301	CFE	12/02/11 13:16	
SM 4500-CN-1	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0013		W149302	CFE	12/02/11 14:14	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: **Suriname - Merian Gold 2011 / 113-93245**
Work Order: **W1K0622**
Reported: 16-Dec-11 10:39

Quality Control - BLANK Data

Method	Analyte	Units	Result	MDL	MRL	Batch ID	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	mg/L	<0.00020	0.000072	0.00020	W150236	09-Dec-11	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	mg/L	<0.080	0.008	0.080	W149245	12-Dec-11	
EPA 200.7	Barium	mg/L	<0.0020	0.0002	0.0020	W149245	12-Dec-11	
EPA 200.7	Beryllium	mg/L	<0.0020	0.0002	0.0020	W149245	12-Dec-11	
EPA 200.7	Boron	mg/L	<0.040	0.005	0.040	W149245	12-Dec-11	
EPA 200.7	Cadmium	mg/L	<0.0020	0.0002	0.0020	W149245	12-Dec-11	
EPA 200.7	Calcium	mg/L	<0.040	0.006	0.040	W149245	12-Dec-11	
EPA 200.7	Chromium	mg/L	<0.0060	0.0003	0.0060	W149245	12-Dec-11	
EPA 200.7	Cobalt	mg/L	<0.0060	0.0005	0.0060	W149245	12-Dec-11	
EPA 200.7	Copper	mg/L	<0.010	0.002	0.010	W149245	12-Dec-11	
EPA 200.7	Iron	mg/L	<0.060	0.008	0.060	W149245	12-Dec-11	
EPA 200.7	Lead	mg/L	<0.0075	0.0017	0.0075	W149245	12-Dec-11	
EPA 200.7	Magnesium	mg/L	<0.060	0.010	0.060	W149245	12-Dec-11	
EPA 200.7	Manganese	mg/L	<0.0040	0.0006	0.0040	W149245	12-Dec-11	
EPA 200.7	Molybdenum	mg/L	<0.008	0.0006	0.008	W149245	12-Dec-11	
EPA 200.7	Nickel	mg/L	<0.010	0.002	0.010	W149245	12-Dec-11	
EPA 200.7	Potassium	mg/L	<0.50	0.03	0.50	W149245	12-Dec-11	
EPA 200.7	Silicon	mg/L	<0.08	0.01	0.08	W149245	12-Dec-11	
EPA 200.7	Silver	mg/L	<0.0050	0.0003	0.0050	W149245	12-Dec-11	
EPA 200.7	Sodium	mg/L	<0.50	0.02	0.50	W149245	12-Dec-11	
EPA 200.7	Titanium	mg/L	<0.0050	0.0002	0.0050	W149245	12-Dec-11	
EPA 200.7	Vanadium	mg/L	<0.0050	0.0002	0.0050	W149245	12-Dec-11	
EPA 200.7	Zinc	mg/L	<0.0100	0.0010	0.0100	W149245	12-Dec-11	
EPA 200.8	Antimony	mg/L	<0.00300	0.00009	0.00300	W149249	06-Dec-11	
EPA 200.8	Arsenic	mg/L	<0.0030	0.0006	0.0030	W149249	06-Dec-11	
EPA 200.8	Selenium	mg/L	<0.00300	0.00070	0.00300	W149249	06-Dec-11	
EPA 200.8	Uranium	mg/L	<0.00100	0.000011	0.00100	W149249	06-Dec-11	
EPA 200.8	Thallium	mg/L	<0.00100	0.000015	0.00100	W149249	06-Dec-11	

Metals (Dissolved)

EPA 200.7	Aluminum	mg/L	<0.080	0.016	0.080	W149246	12-Dec-11	
EPA 200.7	Barium	mg/L	<0.0020	0.0004	0.0020	W149246	12-Dec-11	
EPA 200.7	Beryllium	mg/L	<0.0020	0.0004	0.0020	W149246	12-Dec-11	
EPA 200.7	Boron	mg/L	<0.040	0.010	0.040	W149246	12-Dec-11	
EPA 200.7	Cadmium	mg/L	<0.0020	0.0005	0.0020	W149246	12-Dec-11	
EPA 200.7	Calcium	mg/L	<0.040	0.012	0.040	W149246	12-Dec-11	
EPA 200.7	Chromium	mg/L	<0.0060	0.0006	0.0060	W149246	12-Dec-11	
EPA 200.7	Cobalt	mg/L	<0.0060	0.0009	0.0060	W149246	12-Dec-11	
EPA 200.7	Copper	mg/L	<0.010	0.003	0.010	W149246	12-Dec-11	
EPA 200.7	Iron	mg/L	<0.060	0.017	0.060	W149246	12-Dec-11	
EPA 200.7	Lead	mg/L	<0.0075	0.0034	0.0075	W149246	12-Dec-11	
EPA 200.7	Magnesium	mg/L	<0.060	0.021	0.060	W149246	12-Dec-11	
EPA 200.7	Manganese	mg/L	<0.0040	0.0011	0.0040	W149246	12-Dec-11	
EPA 200.7	Molybdenum	mg/L	<0.008	0.001	0.008	W149246	12-Dec-11	
EPA 200.7	Nickel	mg/L	<0.010	0.003	0.010	W149246	12-Dec-11	
EPA 200.7	Potassium	mg/L	<0.50	0.07	0.50	W149246	12-Dec-11	
EPA 200.7	Silicon	mg/L	<0.08	0.03	0.08	W149246	12-Dec-11	
EPA 200.7	Silver	mg/L	<0.0050	0.0005	0.0050	W149246	12-Dec-11	
EPA 200.7	Sodium	mg/L	<0.50	0.04	0.50	W149246	12-Dec-11	
EPA 200.7	Titanium	mg/L	<0.0050	0.0003	0.0050	W149246	12-Dec-11	
EPA 200.7	Vanadium	mg/L	<0.0050	0.0005	0.0050	W149246	12-Dec-11	
EPA 200.7	Zinc	mg/L	<0.0100	0.0021	0.0100	W149246	12-Dec-11	
EPA 200.8	Antimony	mg/L	<0.00300	0.00007	0.00300	W149270	07-Dec-11	
EPA 200.8	Arsenic	mg/L	<0.0030	0.0005	0.0030	W149270	07-Dec-11	
EPA 200.8	Selenium	mg/L	<0.00300	0.00056	0.00300	W149270	07-Dec-11	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



Golder Associates (WA)
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Project Name: Suriname - Merian Gold 2011 / 113-93245
Work Order: **W1K0622**
Reported: 16-Dec-11 10:39

Quality Control - BLANK Data (Continued)

Method	Analyte	Units	Result	MDL	MRL	Batch ID	Analyzed	Notes
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Metals (Dissolved) (Continued)

EPA 200.8	Thallium	mg/L	<0.00100	0.000012	0.00100	W149270	07-Dec-11	
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Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	mg/L	<0.005	0.0009	0.005	W149305	02-Dec-11	
EPA 120.1	Specific conductance	µmhos/cm	<5.00		5.00	W149329	05-Dec-11	
EPA 180.1	Turbidity	NTU	<0.100		0.100	W149308	01-Dec-11	
EPA 335.4	Cyanide (total)	mg/L	<0.0100	0.0024	0.0100	W149301	02-Dec-11	
EPA 350.1	Ammonia as N	mg/L	<0.030	0.009	0.030	W149298	06-Dec-11	
EPA 353.2	Nitrate/Nitrite as N	mg/L	<0.050	0.015	0.050	W150178	08-Dec-11	
EPA 353.2	Nitrate/Nitrite as N	mg/L	<0.050	0.015	0.050	W150180	08-Dec-11	
EPA 410.4	Chemical Oxygen Demand	mg/L	<5.0	2.1	5.0	W150044	06-Dec-11	
SM 2540 C	Total Diss. Solids	mg/L	<10		10	W149262	01-Dec-11	
SM 2540 C	Total Diss. Solids	mg/L	<10		10	W149353	02-Dec-11	
SM 2540 C	Total Diss. Solids	mg/L	<10		10	W151183	14-Dec-11	
SM 2540 D	Total Susp. Solids	mg/L	<5.0		5.0	W149257	01-Dec-11	
SM 2540 D	Total Susp. Solids	mg/L	<5.0		5.0	W149354	02-Dec-11	
SM 4500-CN-I	Cyanide (WAD)	mg/L	<0.0100	0.0013	0.0100	W149302	02-Dec-11	
SM 4500-P-E	Phosphorus	mg/L	<0.010	0.004	0.010	W149343	05-Dec-11	
SM 5310B	Total Organic Carbon	mg/L	<1.00	0.18	1.00	W150160	07-Dec-11	
SM 5310B	Total Organic Carbon	mg/L	<1.00	0.18	1.00	W150161	07-Dec-11	

Anions by Ion Chromatography

EPA 300.0	Fluoride	mg/L	<0.10	0.02	0.10	W150116	06-Dec-11	
EPA 300.0	Chloride	mg/L	<0.20	0.07	0.20	W150116	06-Dec-11	
EPA 300.0	Sulfate as SO4	mg/L	<0.30	0.04	0.30	W150116	06-Dec-11	

Quality Control - LABORATORY CONTROL SAMPLE Data

Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	mg/L	0.00514	0.00500	103	85 - 115	W150236	09-Dec-11	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	mg/L	0.992	1.00	99.2	85 - 115	W149245	12-Dec-11	
EPA 200.7	Barium	mg/L	1.00	1.00	100	85 - 115	W149245	12-Dec-11	
EPA 200.7	Beryllium	mg/L	1.04	1.00	104	85 - 115	W149245	12-Dec-11	
EPA 200.7	Boron	mg/L	1.03	1.00	103	85 - 115	W149245	12-Dec-11	
EPA 200.7	Cadmium	mg/L	0.970	1.00	97.0	85 - 115	W149245	12-Dec-11	
EPA 200.7	Calcium	mg/L	19.1	20.0	95.7	85 - 115	W149245	12-Dec-11	
EPA 200.7	Chromium	mg/L	0.958	1.00	95.8	85 - 115	W149245	12-Dec-11	
EPA 200.7	Cobalt	mg/L	0.944	1.00	94.4	85 - 115	W149245	12-Dec-11	
EPA 200.7	Copper	mg/L	0.923	1.00	92.3	85 - 115	W149245	12-Dec-11	
EPA 200.7	Iron	mg/L	9.73	10.0	97.3	85 - 115	W149245	12-Dec-11	
EPA 200.7	Lead	mg/L	0.930	1.00	93.0	85 - 115	W149245	12-Dec-11	
EPA 200.7	Magnesium	mg/L	19.0	20.0	95.2	85 - 115	W149245	12-Dec-11	
EPA 200.7	Manganese	mg/L	1.01	1.00	101	85 - 115	W149245	12-Dec-11	
EPA 200.7	Molybdenum	mg/L	0.988	1.00	98.8	85 - 115	W149245	12-Dec-11	
EPA 200.7	Nickel	mg/L	0.894	1.00	89.4	85 - 115	W149245	12-Dec-11	
EPA 200.7	Potassium	mg/L	19.1	20.0	95.4	85 - 115	W149245	12-Dec-11	
EPA 200.7	Silicon	mg/L	5.27	5.00	105	85 - 115	W149245	12-Dec-11	
EPA 200.7	Silver	mg/L	0.0505	0.0500	101	85 - 115	W149245	12-Dec-11	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1K0622**

Reported: 16-Dec-11 10:39

Quality Control - LABORATORY CONTROL SAMPLE Data (Continued)									
Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes

Metals (Total Recoverable--reportable as Total per 40 CFR 136) (Continued)

EPA 200.7	Sodium	mg/L	17.5	19.0	92.0	85 - 115	W149245	12-Dec-11	
EPA 200.7	Titanium	mg/L	0.993	1.00	99.3	85 - 115	W149245	12-Dec-11	
EPA 200.7	Vanadium	mg/L	0.979	1.00	97.9	85 - 115	W149245	12-Dec-11	
EPA 200.7	Zinc	mg/L	0.936	1.00	93.6	85 - 115	W149245	12-Dec-11	
EPA 200.8	Antimony	mg/L	0.0272	0.0250	109	85 - 115	W149249	06-Dec-11	
EPA 200.8	Arsenic	mg/L	0.0259	0.0250	104	85 - 115	W149249	06-Dec-11	
EPA 200.8	Selenium	mg/L	0.0259	0.0250	103	85 - 115	W149249	06-Dec-11	
EPA 200.8	Uranium	mg/L	0.0262	0.0250	105	85 - 115	W149249	06-Dec-11	
EPA 200.8	Thallium	mg/L	0.0263	0.0250	105	85 - 115	W149249	06-Dec-11	

Metals (Dissolved)

EPA 200.7	Aluminum	mg/L	0.967	1.00	96.7	85 - 115	W149246	12-Dec-11	
EPA 200.7	Barium	mg/L	0.987	1.00	98.7	85 - 115	W149246	12-Dec-11	
EPA 200.7	Beryllium	mg/L	0.966	1.00	96.6	85 - 115	W149246	12-Dec-11	
EPA 200.7	Boron	mg/L	0.980	1.00	98.0	85 - 115	W149246	12-Dec-11	
EPA 200.7	Cadmium	mg/L	0.988	1.00	98.8	85 - 115	W149246	12-Dec-11	
EPA 200.7	Calcium	mg/L	19.2	20.0	95.8	85 - 115	W149246	12-Dec-11	
EPA 200.7	Chromium	mg/L	0.983	1.00	98.3	85 - 115	W149246	12-Dec-11	
EPA 200.7	Cobalt	mg/L	0.995	1.00	99.5	85 - 115	W149246	12-Dec-11	
EPA 200.7	Copper	mg/L	0.989	1.00	98.9	85 - 115	W149246	12-Dec-11	
EPA 200.7	Iron	mg/L	9.80	10.0	98.0	85 - 115	W149246	12-Dec-11	
EPA 200.7	Lead	mg/L	0.980	1.00	98.0	85 - 115	W149246	12-Dec-11	
EPA 200.7	Magnesium	mg/L	19.0	20.0	94.9	85 - 115	W149246	12-Dec-11	
EPA 200.7	Manganese	mg/L	0.953	1.00	95.3	85 - 115	W149246	12-Dec-11	
EPA 200.7	Molybdenum	mg/L	0.970	1.00	97.0	85 - 115	W149246	12-Dec-11	
EPA 200.7	Nickel	mg/L	0.935	1.00	93.5	85 - 115	W149246	12-Dec-11	
EPA 200.7	Potassium	mg/L	19.2	20.0	95.9	85 - 115	W149246	12-Dec-11	
EPA 200.7	Silicon	mg/L	4.99	5.00	99.8	85 - 115	W149246	12-Dec-11	
EPA 200.7	Silver	mg/L	0.0500	0.0500	99.9	85 - 115	W149246	12-Dec-11	
EPA 200.7	Sodium	mg/L	18.1	19.0	95.0	85 - 115	W149246	12-Dec-11	
EPA 200.7	Titanium	mg/L	0.982	1.00	98.2	85 - 115	W149246	12-Dec-11	
EPA 200.7	Vanadium	mg/L	0.971	1.00	97.1	85 - 115	W149246	12-Dec-11	
EPA 200.7	Zinc	mg/L	0.956	1.00	95.6	85 - 115	W149246	12-Dec-11	
EPA 200.8	Antimony	mg/L	0.0248	0.0250	99.0	85 - 115	W149270	07-Dec-11	
EPA 200.8	Arsenic	mg/L	0.0240	0.0250	96.1	85 - 115	W149270	07-Dec-11	
EPA 200.8	Selenium	mg/L	0.0242	0.0250	96.7	85 - 115	W149270	07-Dec-11	
EPA 200.8	Thallium	mg/L	0.0255	0.0250	102	85 - 115	W149270	07-Dec-11	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	mg/L	0.141	0.150	94.1	85 - 115	W149305	02-Dec-11	
EPA 120.1	Specific conductance	µmhos/cm	479	479	99.9	90 - 110	W149329	05-Dec-11	
EPA 180.1	Turbidity	NTU	4.31	4.39	98.2	90 - 110	W149308	01-Dec-11	
EPA 335.4	Cyanide (total)	mg/L	0.159	0.150	106	90 - 110	W149301	02-Dec-11	
EPA 350.1	Ammonia as N	mg/L	0.729	0.750	97.2	90 - 110	W149298	06-Dec-11	
EPA 353.2	Nitrate/Nitrite as N	mg/L	1.88	2.00	93.8	90 - 110	W150178	08-Dec-11	
EPA 353.2	Nitrate/Nitrite as N	mg/L	1.81	2.00	90.7	90 - 110	W150180	08-Dec-11	
EPA 410.4	Chemical Oxygen Demand	mg/L	112	113	99.1	90 - 110	W150044	06-Dec-11	
SM 4500-CN-I	Cyanide (WAD)	mg/L	0.145	0.150	96.7	90 - 110	W149302	02-Dec-11	
SM 4500-P-E	Phosphorus	mg/L	0.877	0.877	100	90 - 110	W149343	05-Dec-11	
SM 5310B	Total Organic Carbon	mg/L	67.7	66.7	102	80 - 120	W150160	07-Dec-11	
SM 5310B	Total Organic Carbon	mg/L	67.4	66.7	101	80 - 120	W150161	07-Dec-11	

Anions by Ion Chromatography

EPA 300.0	Fluoride	mg/L	1.95	2.00	97.4	90 - 110	W150116	06-Dec-11	
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SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



Golder Associates (WA)
 18300 NE Union Hill Road, Suite 200
 Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245
 Work Order: **W1K0622**
 Reported: 16-Dec-11 10:39

Quality Control - LABORATORY CONTROL SAMPLE Data (Continued)

Anions by Ion Chromatography (Continued)

Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
EPA 300.0	Chloride	mg/L	2.94	3.00	97.9	90 - 110	W150116	06-Dec-11	
EPA 300.0	Sulfate as SO4	mg/L	10.1	10.0	101	90 - 110	W150116	06-Dec-11	

Quality Control - DUPLICATE Data

Method	Analyte	Units	Duplicate Result	Sample Result	RPD	RPD Limit	Batch ID	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	mg/L	<0.00020	<0.00020	UDL	20	W150236	09-Dec-11	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	mg/L	0.155	0.119	26.4	20	W149245	12-Dec-11	R1
EPA 200.7	Barium	mg/L	0.0038	0.0037	2.6	20	W149245	12-Dec-11	
EPA 200.7	Beryllium	mg/L	<0.0020	<0.0020	UDL	20	W149245	12-Dec-11	
EPA 200.7	Boron	mg/L	<0.040	<0.040	<RL	20	W149245	12-Dec-11	
EPA 200.7	Cadmium	mg/L	<0.0020	<0.0020	UDL	20	W149245	12-Dec-11	
EPA 200.7	Calcium	mg/L	1.13	1.13	0.1	20	W149245	12-Dec-11	
EPA 200.7	Chromium	mg/L	<0.0060	<0.0060	<RL	20	W149245	12-Dec-11	
EPA 200.7	Cobalt	mg/L	<0.0060	<0.0060	UDL	20	W149245	12-Dec-11	
EPA 200.7	Copper	mg/L	<0.010	<0.010	UDL	20	W149245	12-Dec-11	
EPA 200.7	Iron	mg/L	5.14	4.98	3.1	20	W149245	12-Dec-11	
EPA 200.7	Lead	mg/L	<0.0075	<0.0075	UDL	20	W149245	12-Dec-11	
EPA 200.7	Magnesium	mg/L	1.20	1.19	0.3	20	W149245	12-Dec-11	
EPA 200.7	Manganese	mg/L	0.0413	0.0414	0.3	20	W149245	12-Dec-11	
EPA 200.7	Molybdenum	mg/L	<0.008	<0.008	UDL	20	W149245	12-Dec-11	
EPA 200.7	Nickel	mg/L	<0.010	<0.010	<RL	20	W149245	12-Dec-11	
EPA 200.7	Potassium	mg/L	0.53	0.54	1.3	20	W149245	12-Dec-11	
EPA 200.7	Silicon	mg/L	3.53	3.50	0.9	20	W149245	12-Dec-11	
EPA 200.7	Silver	mg/L	<0.0050	<0.0050	UDL	20	W149245	12-Dec-11	
EPA 200.7	Sodium	mg/L	2.74	2.76	0.7	20	W149245	12-Dec-11	
EPA 200.7	Titanium	mg/L	<0.0050	<0.0050	<RL	20	W149245	12-Dec-11	
EPA 200.7	Vanadium	mg/L	<0.0050	<0.0050	<RL	20	W149245	12-Dec-11	
EPA 200.7	Zinc	mg/L	<0.0100	<0.0100	UDL	20	W149245	12-Dec-11	
EPA 200.8	Antimony	mg/L	<0.00300	<0.00300	UDL	20	W149249	06-Dec-11	
EPA 200.8	Arsenic	mg/L	<0.0030	<0.0030	UDL	20	W149249	06-Dec-11	
EPA 200.8	Selenium	mg/L	<0.00300	<0.00300	UDL	20	W149249	06-Dec-11	
EPA 200.8	Uranium	mg/L	<0.00100	<0.00100	<RL	20	W149249	06-Dec-11	
EPA 200.8	Thallium	mg/L	<0.00100	<0.00100	UDL	20	W149249	06-Dec-11	

Metals (Dissolved)

EPA 200.7	Aluminum	mg/L	<0.080	<0.080	<RL	20	W149246	12-Dec-11	
EPA 200.7	Barium	mg/L	0.0085	0.0086	0.6	20	W149246	12-Dec-11	
EPA 200.7	Beryllium	mg/L	<0.0020	<0.0020	UDL	20	W149246	12-Dec-11	
EPA 200.7	Boron	mg/L	<0.040	<0.040	<RL	20	W149246	12-Dec-11	
EPA 200.7	Cadmium	mg/L	<0.0020	<0.0020	UDL	20	W149246	12-Dec-11	
EPA 200.7	Calcium	mg/L	1.75	1.74	0.9	20	W149246	12-Dec-11	
EPA 200.7	Chromium	mg/L	<0.0060	<0.0060	<RL	20	W149246	12-Dec-11	
EPA 200.7	Cobalt	mg/L	<0.0060	<0.0060	<RL	20	W149246	12-Dec-11	
EPA 200.7	Copper	mg/L	<0.010	<0.010	UDL	20	W149246	12-Dec-11	
EPA 200.7	Iron	mg/L	1.42	1.41	0.7	20	W149246	12-Dec-11	
EPA 200.7	Lead	mg/L	<0.0075	<0.0075	UDL	20	W149246	12-Dec-11	
EPA 200.7	Magnesium	mg/L	1.58	1.57	0.6	20	W149246	12-Dec-11	
EPA 200.7	Manganese	mg/L	0.0909	0.0907	0.2	20	W149246	12-Dec-11	
EPA 200.7	Molybdenum	mg/L	<0.008	<0.008	<RL	20	W149246	12-Dec-11	

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Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245
Work Order: **W1K0622**
Reported: 16-Dec-11 10:39

Quality Control - DUPLICATE Data (Continued)

Method	Analyte	Units	Duplicate Result	Sample Result	RPD	RPD Limit	Batch ID	Analyzed	Notes
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Metals (Dissolved) (Continued)

EPA 200.7	Nickel	mg/L	<0.010	<0.010	UDL	20	W149246	12-Dec-11	
EPA 200.7	Potassium	mg/L	1.20	1.20	0.3	20	W149246	12-Dec-11	
EPA 200.7	Silicon	mg/L	3.35	3.35	0.2	20	W149246	12-Dec-11	
EPA 200.7	Silver	mg/L	<0.0050	<0.0050	UDL	20	W149246	12-Dec-11	
EPA 200.7	Sodium	mg/L	3.50	3.50	0.1	20	W149246	12-Dec-11	
EPA 200.7	Titanium	mg/L	<0.0050	<0.0050	<RL	20	W149246	12-Dec-11	
EPA 200.7	Vanadium	mg/L	<0.0050	<0.0050	UDL	20	W149246	12-Dec-11	
EPA 200.7	Zinc	mg/L	<0.0100	<0.0100	UDL	20	W149246	12-Dec-11	
EPA 200.8	Antimony	mg/L	<0.00300	<0.00300	<RL	20	W149270	07-Dec-11	
EPA 200.8	Arsenic	mg/L	<0.0030	<0.0030	UDL	20	W149270	07-Dec-11	
EPA 200.8	Selenium	mg/L	<0.00300	<0.00300	<RL	20	W149270	07-Dec-11	
EPA 200.8	Thallium	mg/L	<0.00100	<0.00100	UDL	20	W149270	07-Dec-11	

Classical Chemistry Parameters

EPA 120.1	Specific conductance	µmhos/cm	18.6	18.7	0.1	20	W149329	05-Dec-11	
EPA 120.1	Specific conductance	µmhos/cm	57.6	59.0	2.3	20	W149329	05-Dec-11	
EPA 180.1	Turbidity	NTU	57.5	58.5	1.7	20	W149308	01-Dec-11	D2
EPA 335.4	Cyanide (total)	mg/L	<0.0100	<0.0100	UDL	20	W149301	02-Dec-11	
EPA 350.1	Ammonia as N	mg/L	1.35	1.40	3.9	20	W149298	06-Dec-11	D2
EPA 353.2	Nitrate/Nitrite as N	mg/L	0.143	0.156	8.8	20	W150180	08-Dec-11	
EPA 353.2	Nitrate/Nitrite as N	mg/L	0.622	0.684	9.5	20	W150178	08-Dec-11	
EPA 410.4	Chemical Oxygen Demand	mg/L	45.3	44.6	1.5	20	W150044	06-Dec-11	
SM 2320B/2310B	Total Alkalinity	mg/L	14.3	13.8	4.0	20	W149271	01-Dec-11	
SM 2320B/2310B	Total Alkalinity	mg/L	5.8	5.8	1.4	20	W149271	01-Dec-11	
SM 2320B/2310B	Bicarbonate	mg/L	14.3	13.8	4.0	20	W149271	01-Dec-11	
SM 2320B/2310B	Bicarbonate	mg/L	5.8	5.8	1.4	20	W149271	01-Dec-11	
SM 2320B/2310B	Carbonate	mg/L	<1.0	<1.0	UDL	20	W149271	01-Dec-11	
SM 2320B/2310B	Carbonate	mg/L	<1.0	<1.0	UDL	20	W149271	01-Dec-11	
SM 2540 C	Total Diss. Solids	mg/L	100	100	0.0	10	W149353	02-Dec-11	
SM 2540 C	Total Diss. Solids	mg/L	105	94	11.1	10	W149262	01-Dec-11	R1
SM 2540 C	Total Diss. Solids	mg/L	390	420	7.4	10	W151183	14-Dec-11	
SM 2540 C	Total Diss. Solids	mg/L	77	73	5.3	10	W149262	01-Dec-11	
SM 2540 D	Total Susp. Solids	mg/L	2780	2760	0.7	10	W149257	01-Dec-11	
SM 2540 D	Total Susp. Solids	mg/L	34.0	34.0	0.0	10	W149354	02-Dec-11	
SM 2540 D	Total Susp. Solids	mg/L	46.0	64.0	32.7	10	W149257	01-Dec-11	R1
SM 4500 H B	pH	pH Units	6.30	6.40	1.6	20	W149271	01-Dec-11	
SM 4500 H B	pH	pH Units	6.57	6.66	1.4	20	W149271	01-Dec-11	
SM 4500-CN-I	Cyanide (WAD)	mg/L	<0.0100	<0.0100	<RL	20	W149302	02-Dec-11	
SM 4500-P-E	Phosphorus	mg/L	<0.010	<0.010	UDL	20	W149343	05-Dec-11	
SM 5310B	Total Organic Carbon	mg/L	1.51	1.45	3.9	20	W150160	07-Dec-11	
SM 5310B	Total Organic Carbon	mg/L	4.06	4.07	0.3	20	W150161	07-Dec-11	

Anions by Ion Chromatography

EPA 300.0	Fluoride	mg/L	<0.10	<0.10	<RL	20	W150116	06-Dec-11	
EPA 300.0	Chloride	mg/L	6.04	6.08	0.8	20	W150116	06-Dec-11	
EPA 300.0	Sulfate as SO4	mg/L	1.81	1.72	5.3	20	W150116	06-Dec-11	



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: **Suriname - Merian Gold 2011 / 113-93245**
Work Order: **W1K0622**
Reported: 16-Dec-11 10:39

Quality Control - MATRIX SPIKE Data

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	mg/L	0.00102	<0.00020	0.00100	102	70 - 130	W150236	09-Dec-11	
EPA 245.1	Mercury	mg/L	0.00132	<0.00020	0.00100	132	70 - 130	W150236	09-Dec-11	M1

Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	mg/L	1.52	0.119	1.00	140	70 - 130	W149245	12-Dec-11	M1
EPA 200.7	Aluminum	mg/L	1.00	<0.080	1.00	100	70 - 130	W149245	12-Dec-11	
EPA 200.7	Barium	mg/L	1.01	0.0037	1.00	101	70 - 130	W149245	12-Dec-11	
EPA 200.7	Barium	mg/L	1.01	0.0129	1.00	99.7	70 - 130	W149245	12-Dec-11	
EPA 200.7	Beryllium	mg/L	1.03	<0.0020	1.00	103	70 - 130	W149245	12-Dec-11	
EPA 200.7	Beryllium	mg/L	1.03	<0.0020	1.00	103	70 - 130	W149245	12-Dec-11	
EPA 200.7	Boron	mg/L	1.05	<0.040	1.00	104	70 - 130	W149245	12-Dec-11	
EPA 200.7	Boron	mg/L	1.05	<0.040	1.00	104	70 - 130	W149245	12-Dec-11	
EPA 200.7	Cadmium	mg/L	0.959	<0.0020	1.00	95.9	70 - 130	W149245	12-Dec-11	
EPA 200.7	Cadmium	mg/L	0.968	<0.0020	1.00	96.8	70 - 130	W149245	12-Dec-11	
EPA 200.7	Calcium	mg/L	20.2	1.13	20.0	95.4	70 - 130	W149245	12-Dec-11	
EPA 200.7	Calcium	mg/L	20.1	0.970	20.0	95.5	70 - 130	W149245	12-Dec-11	
EPA 200.7	Chromium	mg/L	0.952	<0.0060	1.00	94.9	70 - 130	W149245	12-Dec-11	
EPA 200.7	Chromium	mg/L	0.961	0.0066	1.00	95.5	70 - 130	W149245	12-Dec-11	
EPA 200.7	Cobalt	mg/L	0.943	<0.0060	1.00	94.3	70 - 130	W149245	12-Dec-11	
EPA 200.7	Cobalt	mg/L	0.945	<0.0060	1.00	94.5	70 - 130	W149245	12-Dec-11	
EPA 200.7	Copper	mg/L	0.922	<0.010	1.00	92.2	70 - 130	W149245	12-Dec-11	
EPA 200.7	Copper	mg/L	1.04	0.118	1.00	92.6	70 - 130	W149245	12-Dec-11	
EPA 200.7	Iron	mg/L	14.7	4.98	10.0	97.5	70 - 130	W149245	12-Dec-11	
EPA 200.7	Iron	mg/L	9.78	<0.060	10.0	97.5	70 - 130	W149245	12-Dec-11	
EPA 200.7	Lead	mg/L	0.923	<0.0075	1.00	92.3	70 - 130	W149245	12-Dec-11	
EPA 200.7	Lead	mg/L	0.947	<0.0075	1.00	94.5	70 - 130	W149245	12-Dec-11	
EPA 200.7	Magnesium	mg/L	20.3	1.19	20.0	95.6	70 - 130	W149245	12-Dec-11	
EPA 200.7	Magnesium	mg/L	19.4	0.213	20.0	95.7	70 - 130	W149245	12-Dec-11	
EPA 200.7	Manganese	mg/L	1.06	0.0414	1.00	102	70 - 130	W149245	12-Dec-11	
EPA 200.7	Manganese	mg/L	1.03	0.0056	1.00	102	70 - 130	W149245	12-Dec-11	
EPA 200.7	Molybdenum	mg/L	0.981	<0.008	1.00	98.1	70 - 130	W149245	12-Dec-11	
EPA 200.7	Molybdenum	mg/L	0.982	<0.008	1.00	98.1	70 - 130	W149245	12-Dec-11	
EPA 200.7	Nickel	mg/L	0.889	<0.010	1.00	88.7	70 - 130	W149245	12-Dec-11	
EPA 200.7	Nickel	mg/L	0.891	<0.010	1.00	88.8	70 - 130	W149245	12-Dec-11	
EPA 200.7	Potassium	mg/L	19.5	0.54	20.0	95.0	70 - 130	W149245	12-Dec-11	
EPA 200.7	Potassium	mg/L	19.8	0.53	20.0	96.6	70 - 130	W149245	12-Dec-11	
EPA 200.7	Silicon	mg/L	9.33	3.50	5.00	117	70 - 130	W149245	12-Dec-11	
EPA 200.7	Silicon	mg/L	5.62	0.25	5.00	107	70 - 130	W149245	12-Dec-11	
EPA 200.7	Silver	mg/L	0.0500	<0.0050	0.0500	100	70 - 130	W149245	12-Dec-11	
EPA 200.7	Silver	mg/L	0.0506	<0.0050	0.0500	101	70 - 130	W149245	12-Dec-11	
EPA 200.7	Sodium	mg/L	20.0	2.76	19.0	90.9	70 - 130	W149245	12-Dec-11	
EPA 200.7	Sodium	mg/L	18.8	1.23	19.0	92.5	70 - 130	W149245	12-Dec-11	
EPA 200.7	Titanium	mg/L	0.996	<0.0050	1.00	99.4	70 - 130	W149245	12-Dec-11	
EPA 200.7	Titanium	mg/L	0.996	<0.0050	1.00	99.6	70 - 130	W149245	12-Dec-11	
EPA 200.7	Vanadium	mg/L	0.973	<0.0050	1.00	97.2	70 - 130	W149245	12-Dec-11	
EPA 200.7	Vanadium	mg/L	0.982	<0.0050	1.00	98.2	70 - 130	W149245	12-Dec-11	
EPA 200.7	Zinc	mg/L	0.925	<0.0100	1.00	92.5	70 - 130	W149245	12-Dec-11	
EPA 200.7	Zinc	mg/L	1.36	0.427	1.00	93.1	70 - 130	W149245	12-Dec-11	
EPA 200.8	Antimony	mg/L	0.0267	<0.00300	0.0250	107	70 - 130	W149249	06-Dec-11	
EPA 200.8	Antimony	mg/L	0.0284	<0.00300	0.0250	111	70 - 130	W149249	06-Dec-11	
EPA 200.8	Arsenic	mg/L	0.0248	<0.0030	0.0250	99.4	70 - 130	W149249	06-Dec-11	
EPA 200.8	Arsenic	mg/L	0.0250	<0.0030	0.0250	99.9	70 - 130	W149249	06-Dec-11	
EPA 200.8	Selenium	mg/L	0.0241	<0.00300	0.0250	96.5	70 - 130	W149249	06-Dec-11	
EPA 200.8	Selenium	mg/L	0.0249	<0.00300	0.0250	99.7	70 - 130	W149249	06-Dec-11	
EPA 200.8	Uranium	mg/L	0.0263	<0.00100	0.0250	105	70 - 130	W149249	06-Dec-11	
EPA 200.8	Uranium	mg/L	0.0261	<0.00100	0.0250	104	70 - 130	W149249	06-Dec-11	
EPA 200.8	Thallium	mg/L	0.0260	<0.00100	0.0250	104	70 - 130	W149249	06-Dec-11	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
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Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: W1K0622

Reported: 16-Dec-11 10:39

Quality Control - MATRIX SPIKE Data (Continued)

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Total Recoverable--reportable as Total per 40 CFR 136) (Continued)

EPA 200.8	Thallium	mg/L	0.0262	<0.00100	0.0250	105	70 - 130	W149249	06-Dec-11	
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Metals (Dissolved)

EPA 200.7	Aluminum	mg/L	1.10	<0.080	1.00	108	70 - 130	W149246	12-Dec-11	
EPA 200.7	Aluminum	mg/L	1.15	0.096	1.00	105	70 - 130	W149246	12-Dec-11	
EPA 200.7	Barium	mg/L	1.11	0.0086	1.00	110	70 - 130	W149246	12-Dec-11	
EPA 200.7	Barium	mg/L	1.08	0.0033	1.00	107	70 - 130	W149246	12-Dec-11	
EPA 200.7	Beryllium	mg/L	1.04	<0.0020	1.00	104	70 - 130	W149246	12-Dec-11	
EPA 200.7	Beryllium	mg/L	1.01	<0.0020	1.00	101	70 - 130	W149246	12-Dec-11	
EPA 200.7	Boron	mg/L	1.12	<0.040	1.00	111	70 - 130	W149246	12-Dec-11	
EPA 200.7	Boron	mg/L	1.09	<0.040	1.00	109	70 - 130	W149246	12-Dec-11	
EPA 200.7	Cadmium	mg/L	1.11	<0.0020	1.00	111	70 - 130	W149246	12-Dec-11	
EPA 200.7	Cadmium	mg/L	1.08	<0.0020	1.00	108	70 - 130	W149246	12-Dec-11	
EPA 200.7	Calcium	mg/L	23.2	1.74	20.0	107	70 - 130	W149246	12-Dec-11	
EPA 200.7	Calcium	mg/L	21.2	0.418	20.0	104	70 - 130	W149246	12-Dec-11	
EPA 200.7	Chromium	mg/L	1.10	<0.0060	1.00	110	70 - 130	W149246	12-Dec-11	
EPA 200.7	Chromium	mg/L	1.07	<0.0060	1.00	107	70 - 130	W149246	12-Dec-11	
EPA 200.7	Cobalt	mg/L	1.11	<0.0060	1.00	111	70 - 130	W149246	12-Dec-11	
EPA 200.7	Cobalt	mg/L	1.08	<0.0060	1.00	108	70 - 130	W149246	12-Dec-11	
EPA 200.7	Copper	mg/L	1.10	<0.010	1.00	110	70 - 130	W149246	12-Dec-11	
EPA 200.7	Copper	mg/L	1.07	<0.010	1.00	107	70 - 130	W149246	12-Dec-11	
EPA 200.7	Iron	mg/L	12.3	1.41	10.0	109	70 - 130	W149246	12-Dec-11	
EPA 200.7	Iron	mg/L	11.0	0.398	10.0	106	70 - 130	W149246	12-Dec-11	
EPA 200.7	Lead	mg/L	1.11	<0.0075	1.00	111	70 - 130	W149246	12-Dec-11	
EPA 200.7	Lead	mg/L	1.08	<0.0075	1.00	108	70 - 130	W149246	12-Dec-11	
EPA 200.7	Magnesium	mg/L	23.0	1.57	20.0	107	70 - 130	W149246	12-Dec-11	
EPA 200.7	Magnesium	mg/L	21.6	0.728	20.0	105	70 - 130	W149246	12-Dec-11	
EPA 200.7	Manganese	mg/L	1.15	0.0907	1.00	106	70 - 130	W149246	12-Dec-11	
EPA 200.7	Manganese	mg/L	1.05	0.0135	1.00	103	70 - 130	W149246	12-Dec-11	
EPA 200.7	Molybdenum	mg/L	1.08	<0.008	1.00	108	70 - 130	W149246	12-Dec-11	
EPA 200.7	Molybdenum	mg/L	1.05	<0.008	1.00	105	70 - 130	W149246	12-Dec-11	
EPA 200.7	Nickel	mg/L	1.07	<0.010	1.00	107	70 - 130	W149246	12-Dec-11	
EPA 200.7	Nickel	mg/L	1.04	<0.010	1.00	104	70 - 130	W149246	12-Dec-11	
EPA 200.7	Potassium	mg/L	22.8	1.20	20.0	108	70 - 130	W149246	12-Dec-11	
EPA 200.7	Potassium	mg/L	21.4	<0.50	20.0	105	70 - 130	W149246	12-Dec-11	
EPA 200.7	Silicon	mg/L	8.88	3.35	5.00	111	70 - 130	W149246	12-Dec-11	
EPA 200.7	Silicon	mg/L	9.55	4.11	5.00	109	70 - 130	W149246	12-Dec-11	
EPA 200.7	Silver	mg/L	0.0571	<0.0050	0.0500	114	70 - 130	W149246	12-Dec-11	
EPA 200.7	Silver	mg/L	0.0557	<0.0050	0.0500	111	70 - 130	W149246	12-Dec-11	
EPA 200.7	Sodium	mg/L	23.7	3.50	19.0	106	70 - 130	W149246	12-Dec-11	
EPA 200.7	Sodium	mg/L	22.5	2.64	19.0	104	70 - 130	W149246	12-Dec-11	
EPA 200.7	Titanium	mg/L	1.10	<0.0050	1.00	110	70 - 130	W149246	12-Dec-11	
EPA 200.7	Titanium	mg/L	1.07	<0.0050	1.00	107	70 - 130	W149246	12-Dec-11	
EPA 200.7	Vanadium	mg/L	1.08	<0.0050	1.00	108	70 - 130	W149246	12-Dec-11	
EPA 200.7	Vanadium	mg/L	1.06	<0.0050	1.00	106	70 - 130	W149246	12-Dec-11	
EPA 200.7	Zinc	mg/L	1.07	<0.0100	1.00	107	70 - 130	W149246	12-Dec-11	
EPA 200.7	Zinc	mg/L	1.05	<0.0100	1.00	105	70 - 130	W149246	12-Dec-11	
EPA 200.8	Antimony	mg/L	0.0249	<0.00300	0.0250	95.2	70 - 130	W149270	07-Dec-11	
EPA 200.8	Antimony	mg/L	0.0258	<0.00300	0.0250	98.5	70 - 130	W149270	07-Dec-11	
EPA 200.8	Arsenic	mg/L	0.0256	<0.0030	0.0250	102	70 - 130	W149270	07-Dec-11	
EPA 200.8	Arsenic	mg/L	0.0253	<0.0030	0.0250	101	70 - 130	W149270	07-Dec-11	
EPA 200.8	Selenium	mg/L	0.0271	<0.00300	0.0250	109	70 - 130	W149270	07-Dec-11	
EPA 200.8	Selenium	mg/L	0.0263	<0.00300	0.0250	105	70 - 130	W149270	07-Dec-11	
EPA 200.8	Thallium	mg/L	0.0250	<0.00100	0.0250	99.9	70 - 130	W149270	07-Dec-11	
EPA 200.8	Thallium	mg/L	0.0248	<0.00100	0.0250	99.4	70 - 130	W149270	07-Dec-11	



Golder Associates (WA)
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Project Name: Suriname - Merian Gold 2011 / 113-93245
Work Order: **W1K0622**
Reported: 16-Dec-11 10:39

Quality Control - MATRIX SPIKE Data (Continued)

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	mg/L	0.088	<0.005	0.100	85.3	85 - 115	W149305	02-Dec-11	
ASTM D7237	Cyanide (free)	mg/L	0.087	<0.005	0.100	85.3	85 - 115	W149305	02-Dec-11	
EPA 335.4	Cyanide (total)	mg/L	0.105	<0.0100	0.100	105	90 - 110	W149301	02-Dec-11	
EPA 335.4	Cyanide (total)	mg/L	0.106	<0.0100	0.100	106	90 - 110	W149301	02-Dec-11	
EPA 350.1	Ammonia as N	mg/L	0.905	0.458	0.500	89.3	90 - 110	W149298	06-Dec-11	M2
EPA 350.1	Ammonia as N	mg/L	2.11	1.40	0.500	141	90 - 110	W149298	06-Dec-11	D2,M1
EPA 353.2	Nitrate/Nitrite as N	mg/L	1.45	0.156	1.00	129	90 - 110	W150180	08-Dec-11	M1
EPA 353.2	Nitrate/Nitrite as N	mg/L	1.90	0.684	1.00	121	90 - 110	W150178	08-Dec-11	M1
EPA 353.2	Nitrate/Nitrite as N	mg/L	3.62	2.23	1.00	139	90 - 110	W150178	08-Dec-11	M1
EPA 353.2	Nitrate/Nitrite as N	mg/L	2.07	0.788	1.00	128	90 - 110	W150180	08-Dec-11	M1
EPA 410.4	Chemical Oxygen Demand	mg/L	93.4	44.6	50.0	97.6	90 - 110	W150044	06-Dec-11	
EPA 410.4	Chemical Oxygen Demand	mg/L	48.1	<5.0	50.0	96.1	90 - 110	W150044	06-Dec-11	
SM 4500-CN-I	Cyanide (WAD)	mg/L	0.103	<0.0100	0.100	101	75 - 125	W149302	02-Dec-11	
SM 4500-CN-I	Cyanide (WAD)	mg/L	0.104	<0.0100	0.100	102	75 - 125	W149302	02-Dec-11	
SM 4500-P-E	Phosphorus	mg/L	0.504	<0.010	0.500	101	75 - 125	W149343	05-Dec-11	
SM 5310B	Total Organic Carbon	mg/L	52.9	1.45	50.0	103	75 - 125	W150160	07-Dec-11	
SM 5310B	Total Organic Carbon	mg/L	55.8	4.07	50.0	104	75 - 125	W150161	07-Dec-11	

Anions by Ion Chromatography

EPA 300.0	Fluoride	mg/L	2.18	<0.10	2.00	106	90 - 110	W150116	06-Dec-11	
EPA 300.0	Fluoride	mg/L	2.14	<0.10	2.00	104	90 - 110	W150116	06-Dec-11	
EPA 300.0	Chloride	mg/L	9.15	6.08	3.00	102	90 - 110	W150116	06-Dec-11	
EPA 300.0	Chloride	mg/L	7.51	4.42	3.00	103	90 - 110	W150116	06-Dec-11	
EPA 300.0	Sulfate as SO4	mg/L	12.6	1.72	10.0	108	90 - 110	W150116	06-Dec-11	
EPA 300.0	Sulfate as SO4	mg/L	11.5	0.50	10.0	110	90 - 110	W150116	06-Dec-11	

Quality Control - MATRIX SPIKE DUPLICATE Data

Method	Analyte	Units	MSD Result	Spike Result	Spike Level	RPD	RPD Limit	Batch ID	Analyzed	Notes
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Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	mg/L	0.090	0.088	0.100	2.2	20	W149305	02-Dec-11	
SM 4500-P-E	Phosphorus	mg/L	0.508	0.504	0.500	0.8	20	W149343	05-Dec-11	

Quality Control - POST DIGESTION SPIKE Data

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	mg/L	1.03	0.119	1.00	91.5	85 - 115	W149245	12-Dec-11	
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Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1K0622**

Reported: 16-Dec-11 10:39

Notes and Definitions

- D2 Sample required dilution due to high concentration of target analyte.
 - H3 Sample was received and analyzed past holding time.
 - H5 This test is specified to be performed in the field within 15 minutes of sampling; sample was received and analyzed past the regulatory holding time.
 - H6 Initial analysis was within holding time. Reanalysis was run past holding time.
 - M1 Matrix spike recovery was high, but the LCS recovery was acceptable.
 - M2 Matrix spike recovery was low, but the LCS recovery was acceptable.
 - R1 RPD exceeded the method acceptance limit.
 - LCS Laboratory Control Sample (Blank Spike)
 - RPD Relative Percent Difference
 - UDL A result is less than the detection limit
 - R > 4S % recovery not applicable, sample concentration more than four times greater than spike level
 - <RL A result is less than the reporting limit
 - MRL Method Reporting Limit
 - MDL Method Detection Limit
 - N/A Not Applicable
-

Anatek Labs, Inc.

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504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

Client: GOLDER ASSOCIATES
Address: 18300 NE UNION HILL RD. STE. 200
REDMOND, WA 98052
Attn: DEREK HOLOM

Batch #: 111202017
Project Name: SVL #W1L0012

Analytical Results Report

Sample Number	111202017-001	Sampling Date	11/16/2011	Date/Time Received	12/2/2011 11:30 AM
Client Sample ID	11162001SW001	Sampling Time	10:30 AM	Extraction Date	12/02/2011
Matrix	Water	Sample Location	W1L0012-01		

Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Hexane extractable material (HEM)	ND	mg/L	1	12/2/2011	KFG	EPA 1664A	

Sample Number	111202017-002	Sampling Date	11/16/2011	Date/Time Received	12/2/2011 11:30 AM
Client Sample ID	11162001SW002	Sampling Time	11:00 AM	Extraction Date	12/02/2011
Matrix	Water	Sample Location	W1L0012-02		

Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Hexane extractable material (HEM)	ND	mg/L	1	12/2/2011	KFG	EPA 1664A	

Sample Number	111202017-003	Sampling Date	11/16/2011	Date/Time Received	12/2/2011 11:30 AM
Client Sample ID	11162001SW003	Sampling Time	12:00 PM	Extraction Date	12/08/2011
Matrix	Water	Sample Location	W1L0012-03		

Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Hexane extractable material (HEM)	ND	mg/L	1	12/9/2011	KFG	EPA 1664A	

Anatek Labs, Inc.

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504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

Client: GOLDER ASSOCIATES **Batch #:** 111202017
Address: 18300 NE UNION HILL RD. STE. 200 **Project Name:** SVL #W1L0012
REDMOND, WA 98052
Attn: DEREK HOLOM

Analytical Results Report

Sample Number	111202017-004	Sampling Date	11/18/2011	Date/Time Received	12/2/2011 11:30 AM
Client Sample ID	11182001SW004	Sampling Time	9:25 AM	Extraction Date	12/08/2011
Matrix	Water	Sample Location	W1L0012-04		
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Hexane extractable material (HEM)	1.4	mg/L	1	12/9/2011	KFG	EPA 1664A	

Sample Number	111202017-005	Sampling Date	11/20/2011	Date/Time Received	12/2/2011 11:30 AM
Client Sample ID	11202001SW006	Sampling Time	11:15 AM	Extraction Date	12/08/2011
Matrix	Water	Sample Location	W1L0012-06		
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Hexane extractable material (HEM)	ND	mg/L	1	12/9/2011	KFG	EPA 1664A	

Sample Number	111202017-006	Sampling Date	11/20/2011	Date/Time Received	12/2/2011 11:30 AM
Client Sample ID	11202001SW007	Sampling Time	1:15 PM	Extraction Date	12/08/2011
Matrix	Water	Sample Location	W1L0012-07		
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Hexane extractable material (HEM)	ND	mg/L	1	12/9/2011	KFG	EPA 1664A	

Anatek Labs, Inc.

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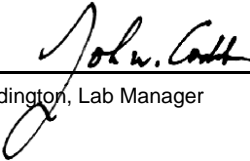
Client: GOLDER ASSOCIATES **Batch #:** 111202017
Address: 18300 NE UNION HILL RD. STE. 200 **Project Name:** SVL #W1L0012
REDMOND, WA 98052
Attn: DEREK HOLOM

Analytical Results Report

Sample Number	111202017-007	Sampling Date	11/20/2011	Date/Time Received	12/2/2011 11:30 AM
Client Sample ID	11202001SW008	Sampling Time	2:40 PM	Extraction Date	12/08/2011
Matrix	Water	Sample Location	W1L0012-08		
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Hexane extractable material (HEM)	ND	mg/L	1	12/9/2011	KFG	EPA 1664A	

Authorized Signature



John Coddington, Lab Manager

H1 Sample analysis performed past holding time.
MCL EPA's Maximum Contaminant Level
ND Not Detected
PQL Practical Quantitation Limit

This report shall not be reproduced except in full, without the written approval of the laboratory.
The results reported relate only to the samples indicated.
Soil/solid results are reported on a dry-weight basis unless otherwise noted.

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Client: GOLDER ASSOCIATES
Address: 18300 NE UNION HILL RD. STE. 200
REDMOND, WA 98052
Attn: DEREK HOLOM

Batch #: 111202017
Project Name: SVL #W1L0012

Analytical Results Report Quality Control Data

Lab Control Sample

Parameter	LCS Result	Units	LCS Spike	%Rec	AR %Rec	Prep Date	Analysis Date
Hexane extractable material (HEM)	33.7	mg/L	40	84.3	79-114	12/9/2011	12/9/2011
Hexane extractable material (HEM)	43.4	mg/L	40	108.5	79-114	12/1/2011	12/1/2011

Lab Control Sample Duplicate

Parameter	LCSD Result	Units	LCSD Spike	%Rec	%RPD	AR %RPD	Prep Date	Analysis Date
Hexane extractable material (HEM)	45.2	mg/L	40	113.0	29.2	0-18	12/9/2011	12/9/2011

Matrix Spike

Sample Number	Parameter	Sample Result	MS Result	Units	MS Spike	%Rec	AR %Rec	Prep Date	Analysis Date
111208025-001	Hexane extractable material (HEM)	ND	42.2	mg/L	40	105.5	79-114	12/9/2011	12/9/2011
111201022-001	Hexane extractable material (HEM)	ND	42.5	mg/L	40	106.3	79-114	12/1/2011	12/1/2011

Matrix Spike Duplicate

Parameter	MSD Result	Units	MSD Spike	%Rec	%RPD	AR %RPD	Prep Date	Analysis Date
Hexane extractable material (HEM)	42.8	mg/L	40	107.0	1.4	0-18	12/9/2011	12/9/2011
Hexane extractable material (HEM)	44.0	mg/L	40	110.0	3.5	0-18	12/1/2011	12/1/2011

Method Blank

Parameter	Result	Units	PQL	Prep Date	Analysis Date
Hexane extractable material (HEM)	ND	mg/L	1	12/9/2011	12/9/2011
Hexane extractable material (HEM)	ND	mg/L	1	12/1/2011	12/1/2011

AR Acceptable Range
ND Not Detected
PQL Practical Quantitation Limit
RPD Relative Percentage Difference

Comments:

Certifications held by Anatek Labs ID: EPA:ID00013; AZ:0701; CO:ID00013; FL(NELAP):E87893; ID:ID00013; IN:C-ID-01; KY:90142; MT:CERT0028; NM: ID00013; OR:ID200001-002; WA:C595
Certifications held by Anatek Labs WA: EPA:WA00169; CA:Cert2632; ID:WA00169; WA:C585; MT:Cert0095

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Login Report

Customer Name: GOLDER ASSOCIATES

Order ID: 111202017

18300 NE UNION HILL RD. STE. 200

Order Date: 12/2/2011

REDMOND WA 98052

Contact Name: DEREK HOLOM

Project Name: SVL #W1L0012

Comment:

Sample #: 111202017-001 **Customer Sample #:** 11162001SW001

Recv'd:

Collector:

Date Collected: 11/16/2011

Quantity: 1

Matrix: Water

Date Received: 12/2/2011 11:30:00 A

Comment:

Test	Lab	Method	Due Date	Priority
FOG - HEM	M	EPA 1664A	12/14/2011	<u>Normal (6-10 Days)</u>

Sample #: 111202017-002 **Customer Sample #:** 11162001SW002

Recv'd:

Collector:

Date Collected: 11/16/2011

Quantity: 1

Matrix: Water

Date Received: 12/2/2011 11:30:00 A

Comment:

Test	Lab	Method	Due Date	Priority
FOG - HEM	M	EPA 1664A	12/14/2011	<u>Normal (6-10 Days)</u>

Sample #: 111202017-003 **Customer Sample #:** 11162001SW003

Recv'd:

Collector:

Date Collected: 11/16/2011

Quantity: 1

Matrix: Water

Date Received: 12/2/2011 11:30:00 A

Comment:

Test	Lab	Method	Due Date	Priority
FOG - HEM	M	EPA 1664A	12/14/2011	<u>Normal (6-10 Days)</u>

Customer Name: GOLDER ASSOCIATES
18300 NE UNION HILL RD. STE. 200
REDMOND WA 98052

Order ID: 111202017
Order Date: 12/2/2011

Contact Name: DEREK HOLOM

Project Name: SVL #W1L0012

Comment:

Sample #: 111202017-004 **Customer Sample #:** 11182001SW004

Recv'd: **Collector:** **Date Collected:** 11/18/2011
Quantity: 1 **Matrix:** Water **Date Received:** 12/2/2011 11:30:00 A
Comment:

Test	Lab	Method	Due Date	Priority
FOG - HEM	M	EPA 1664A	12/14/2011	<u>Normal (6-10 Days)</u>

Sample #: 111202017-005 **Customer Sample #:** 11202001SW006

Recv'd: **Collector:** **Date Collected:** 11/20/2011
Quantity: 1 **Matrix:** Water **Date Received:** 12/2/2011 11:30:00 A
Comment:

Test	Lab	Method	Due Date	Priority
FOG - HEM	M	EPA 1664A	12/14/2011	<u>Normal (6-10 Days)</u>

Sample #: 111202017-006 **Customer Sample #:** 11202001SW007

Recv'd: **Collector:** **Date Collected:** 11/20/2011
Quantity: 1 **Matrix:** Water **Date Received:** 12/2/2011 11:30:00 A
Comment:

Test	Lab	Method	Due Date	Priority
FOG - HEM	M	EPA 1664A	12/14/2011	<u>Normal (6-10 Days)</u>

Sample #: 111202017-007 **Customer Sample #:** 11202001SW008

Recv'd: **Collector:** **Date Collected:** 11/20/2011
Quantity: 1 **Matrix:** Water **Date Received:** 12/2/2011 11:30:00 A
Comment:

Test	Lab	Method	Due Date	Priority
FOG - HEM	M	EPA 1664A	12/14/2011	<u>Normal (6-10 Days)</u>

Customer Name: GOLDER ASSOCIATES
18300 NE UNION HILL RD. STE. 200
REDMOND WA 98052

Order ID: 111202017
Order Date: 12/2/2011

Contact Name: DEREK HOLOM

Project Name: SVL #W1L0012

Comment:

SAMPLE CONDITION RECORD

Samples received in a cooler?	Yes
Samples received intact?	Yes
What is the temperature inside the cooler?	6.0
Samples received with a COC?	Yes
Samples received within holding time?	Yes
Are all sample bottles properly preserved?	Yes
Are VOC samples free of headspace?	N/A
Is there a trip blank to accompany VOC samples?	N/A
Labels and chain agree?	Yes



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: W1L0012

Reported: 21-Dec-11 09:50

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Sampled By	Date Received
11162011SW001	W1L0012-01	Surface Water	16-Nov-11 10:30	DH/JE	01-Dec-2011
11162011SW002	W1L0012-02	Surface Water	16-Nov-11 11:00	DH/JE	01-Dec-2011
11162011SW003	W1L0012-03	Surface Water	16-Nov-11 12:00	DH/JE	01-Dec-2011
11182011SW004	W1L0012-04	Surface Water	18-Nov-11 09:25	DH/JE	01-Dec-2011
11192011SW005	W1L0012-05	Surface Water	19-Nov-11 15:20	DH/JE	01-Dec-2011
11202011SW006	W1L0012-06	Surface Water	20-Nov-11 11:15	DH/JE	01-Dec-2011
11202011SW007	W1L0012-07	Surface Water	20-Nov-11 13:15	DH/JE	01-Dec-2011
11202011SW008	W1L0012-08	Surface Water	20-Nov-11 14:40	DH/JE	01-Dec-2011
11192011GW001	W1L0012-09	Ground Water	19-Nov-11 12:30	DH/JE	01-Dec-2011
11192011GW002	W1L0012-10	Ground Water	19-Nov-11 14:30	DH/JE	01-Dec-2011
11152011SW009	W1L0012-11	Surface Water	15-Nov-11 14:00	DH/JE	01-Dec-2011
11152011SW010	W1L0012-12	Surface Water	15-Nov-11 11:30	DH/JE	01-Dec-2011

Solid samples are analyzed on an as-received, wet-weight basis, unless otherwise requested. Non-Detects are reported at the MDL.

Sample preparation is defined by the client as per their Data Quality Objectives.

This report supercedes any previous reports for this Work Order. The complete report includes pages for each sample, a full QC report, and a notes section.

The results presented in this report relate only to the samples, and meet all requirements of the NELAC Standards unless otherwise noted.

(Q6) SVL received the following containers outside of published EPA guidelines for preservation temperatures (0-6°C).

The guidelines do not pertain to nitric-preserved metals.

Default Cooler (Received Temperature: 17.0°C)

Labnumber	Container	Client ID	Labnumber	Container	Client ID
W1L0012-01 A	Raw HDPE	11162011SW001	W1L0012-01 B	Sulfuric HDPE	11162011SW001
W1L0012-01 C	Filtered nitric HDPE	11162011SW001	W1L0012-01 D	Nitric HDPE	11162011SW001
W1L0012-01 E	NaOH HDPE	11162011SW001	W1L0012-01 F	Sulfuric Amber VOA	11162011SW001
W1L0012-01 G	Sulfuric Amber VOA	11162011SW001	W1L0012-01 H	Sulfuric Amber Glass	11162011SW001
W1L0012-02 A	Raw HDPE	11162011SW002	W1L0012-02 B	Sulfuric HDPE	11162011SW002
W1L0012-02 C	Filtered nitric HDPE	11162011SW002	W1L0012-02 D	Nitric HDPE	11162011SW002
W1L0012-02 E	NaOH HDPE	11162011SW002	W1L0012-02 F	Sulfuric Amber VOA	11162011SW002
W1L0012-02 G	Sulfuric Amber VOA	11162011SW002	W1L0012-02 H	Sulfuric Amber Glass	11162011SW002
W1L0012-03 A	Raw HDPE	11162011SW003	W1L0012-03 B	Sulfuric HDPE	11162011SW003
W1L0012-03 C	Filtered nitric HDPE	11162011SW003	W1L0012-03 D	Nitric HDPE	11162011SW003
W1L0012-03 E	NaOH HDPE	11162011SW003	W1L0012-03 F	Sulfuric Amber VOA	11162011SW003
W1L0012-03 G	Sulfuric Amber VOA	11162011SW003	W1L0012-03 H	Sulfuric Amber Glass	11162011SW003
W1L0012-04 A	Raw HDPE	11182011SW004	W1L0012-04 B	Sulfuric HDPE	11182011SW004
W1L0012-04 C	Filtered nitric HDPE	11182011SW004	W1L0012-04 D	Nitric HDPE	11182011SW004
W1L0012-04 E	NaOH HDPE	11182011SW004	W1L0012-04 F	Sulfuric Amber VOA	11182011SW004
W1L0012-04 G	Sulfuric Amber VOA	11182011SW004	W1L0012-04 H	Sulfuric Amber Glass	11182011SW004
W1L0012-05 A	Raw HDPE	11192011SW005	W1L0012-06 A	Raw HDPE	11202011SW006
W1L0012-06 B	Sulfuric HDPE	11202011SW006	W1L0012-06 C	Filtered nitric HDPE	11202011SW006
W1L0012-06 D	Nitric HDPE	11202011SW006	W1L0012-06 E	NaOH HDPE	11202011SW006
W1L0012-06 F	Sulfuric Amber VOA	11202011SW006	W1L0012-06 G	Sulfuric Amber VOA	11202011SW006
W1L0012-06 H	Sulfuric Amber Glass	11202011SW006	W1L0012-07 A	Raw HDPE	11202011SW007
W1L0012-07 B	Sulfuric HDPE	11202011SW007	W1L0012-07 C	Filtered nitric HDPE	11202011SW007
W1L0012-07 D	Nitric HDPE	11202011SW007	W1L0012-07 E	NaOH HDPE	11202011SW007
W1L0012-07 F	Sulfuric Amber VOA	11202011SW007	W1L0012-07 G	Sulfuric Amber VOA	11202011SW007
W1L0012-07 H	Sulfuric Amber Glass	11202011SW007	W1L0012-08 A	Raw HDPE	11202011SW008
W1L0012-08 B	Sulfuric HDPE	11202011SW008	W1L0012-08 C	Filtered nitric HDPE	11202011SW008
W1L0012-08 D	Nitric HDPE	11202011SW008	W1L0012-08 E	NaOH HDPE	11202011SW008

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0012**

Reported: 21-Dec-11 09:50

Default Cooler (Received Temperature: 17.0°C) (Continued)

<u>Labnumber</u>	<u>Container</u>	<u>Client ID</u>	<u>Labnumber</u>	<u>Container</u>	<u>Client ID</u>
W1L0012-08 F	Sulfuric Amber VOA	11202011SW008	W1L0012-08 G	Sulfuric Amber VOA	11202011SW008
W1L0012-08 H	Sulfuric Amber Glass	11202011SW008	W1L0012-09 A	Raw HDPE	11192011GW001
W1L0012-09 B	Sulfuric HDPE	11192011GW001	W1L0012-09 C	Filtered nitric HDPE	11192011GW001
W1L0012-09 D	Nitric HDPE	11192011GW001	W1L0012-09 E	NaOH HDPE	11192011GW001
W1L0012-10 A	Raw HDPE	11192011GW002	W1L0012-10 B	Sulfuric HDPE	11192011GW002
W1L0012-10 C	Filtered nitric HDPE	11192011GW002	W1L0012-10 D	Nitric HDPE	11192011GW002
W1L0012-10 E	NaOH HDPE	11192011GW002	W1L0012-11 A	Raw HDPE	11152011SW009
W1L0012-12 A	Raw HDPE	11152011SW010			



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: W1L0012

Reported: 21-Dec-11 09:50

Client Sample ID: 11162011SW001

SVL Sample ID: W1L0012-01 (Surface Water)

Sample Report Page 1 of 3

Sampled: 16-Nov-11 10:30

Received: 01-Dec-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W151086	DJA	12/14/11 11:33	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	0.257	mg/L	0.080	0.008		W149315	TJK	12/14/11 10:54	
EPA 200.7	Barium	0.0060	mg/L	0.0020	0.0002		W149315	TJK	12/14/11 10:55	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0002		W149315	TJK	12/14/11 10:54	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W149315	TJK	12/14/11 10:54	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0002		W149315	TJK	12/14/11 10:55	
EPA 200.7	Calcium	1.11	mg/L	0.040	0.006		W149315	TJK	12/14/11 10:54	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0003		W149315	TJK	12/14/11 10:55	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W149315	TJK	12/14/11 10:55	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.002		W149315	TJK	12/14/11 10:55	
EPA 200.7	Iron	4.08	mg/L	0.060	0.008		W149315	TJK	12/14/11 10:54	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0017		W149315	TJK	12/14/11 10:55	
EPA 200.7	Magnesium	1.29	mg/L	0.060	0.010		W149315	TJK	12/14/11 10:54	
EPA 200.7	Manganese	0.0147	mg/L	0.0040	0.0006		W149315	TJK	12/14/11 10:54	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.0006		W149315	TJK	12/14/11 10:55	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W149315	TJK	12/14/11 10:55	
EPA 200.7	Potassium	0.72	mg/L	0.50	0.03		W149315	TJK	12/14/11 10:54	
EPA 200.7	Silicon	4.34	mg/L	0.08	0.01		W149315	TJK	12/14/11 10:54	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0003		W149315	TJK	12/14/11 10:55	
EPA 200.7	Sodium	3.02	mg/L	0.50	0.02		W149315	TJK	12/14/11 10:54	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0002		W149315	TJK	12/14/11 10:55	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0002		W149315	TJK	12/14/11 10:55	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0010		W149315	TJK	12/14/11 10:55	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00009	2.5	W150013	KWH	12/08/11 09:01	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0006	2.5	W150013	KWH	12/08/11 09:01	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00070	2.5	W150013	KWH	12/08/11 09:01	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000015	2.5	W150013	KWH	12/08/11 09:01	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000011	2.5	W150013	KWH	12/08/11 09:01	
SM 2340B	Hardness (as CaCO3)	8.10	mg/L	0.347	0.058		N/A		12/14/11 10:54	



Golder Associates (WA)
 18300 NE Union Hill Road, Suite 200
 Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0012**

Reported: 21-Dec-11 09:50

Client Sample ID: **11162011SW001**

Sampled: 16-Nov-11 10:30

SVL Sample ID: **W1L0012-01 (Surface Water)**

Received: 01-Dec-11

Sample Report Page 2 of 3

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Dissolved)

EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.016		W149313	TJK	12/14/11 12:35	
EPA 200.7	Barium	0.0042	mg/L	0.0020	0.0004		W149313	TJK	12/14/11 12:37	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0004		W149313	TJK	12/14/11 12:35	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W149313	TJK	12/14/11 12:35	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W149313	TJK	12/14/11 12:37	
EPA 200.7	Calcium	1.12	mg/L	0.040	0.012		W149313	TJK	12/14/11 12:35	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W149313	TJK	12/14/11 12:37	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W149313	TJK	12/14/11 12:37	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.003		W149313	TJK	12/14/11 12:37	
EPA 200.7	Iron	1.09	mg/L	0.060	0.017		W149313	TJK	12/14/11 12:35	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0034		W149313	TJK	12/14/11 12:37	
EPA 200.7	Magnesium	1.17	mg/L	0.060	0.021		W149313	TJK	12/14/11 12:35	
EPA 200.7	Manganese	0.0104	mg/L	0.0040	0.0011		W149313	TJK	12/14/11 12:35	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W149313	TJK	12/14/11 12:37	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W149313	TJK	12/14/11 12:37	
EPA 200.7	Potassium	0.57	mg/L	0.50	0.07		W149313	TJK	12/14/11 12:35	
EPA 200.7	Silicon	3.98	mg/L	0.08	0.03		W149313	TJK	12/14/11 12:35	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0005		W149313	TJK	12/14/11 12:37	
EPA 200.7	Sodium	2.79	mg/L	0.50	0.04		W149313	TJK	12/14/11 12:35	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W149313	TJK	12/14/11 12:37	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W149313	TJK	12/14/11 12:37	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0021		W149313	TJK	12/14/11 12:37	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00007		W150023	KWH	12/08/11 07:12	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0005		W150023	KWH	12/08/11 07:12	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00056		W150023	KWH	12/08/11 07:12	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000012		W150023	KWH	12/08/11 07:12	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0009		W149304	CFF	12/02/11 10:36	H3
EPA 120.1	Specific conductance	30.3	µmhos/cm	5.00			W149331	JMS	12/02/11 11:32	
EPA 180.1	Turbidity	19.8	NTU	0.100			W149342	SM	12/02/11 10:52	H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0024		W149300	CFF	12/02/11 11:03	H3
EPA 350.1	Ammonia as N	0.078	mg/L	0.030	0.009		W149297	RHW	12/06/11 10:39	
EPA 353.2	Nitrate/Nitrite as N	0.408	mg/L	0.050	0.015		W150267	RHW	12/14/11 10:31	
EPA 410.4	Chemical Oxygen Demand	16.5	mg/L	5.0	2.1		W150121	SM	12/12/11 10:47	
SM 2320B/2310B	Bicarbonate	7.2	mg/L	1.0	0.5		W149336	DKS	12/02/11 10:15	H3
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.5		W149336	DKS	12/02/11 10:15	H3
SM 2320B/2310B	Total Alkalinity	7.2	mg/L	1.0	0.5		W149336	DKS	12/02/11 10:15	H3
SM 2540 C	Total Diss. Solids	27	mg/L	10			W149323	JMS	12/06/11 10:51	H3
SM 2540 D	Total Susp. Solids	6.0	mg/L	5.0			W149321	JMS	12/06/11 10:51	H3
SM 4500 H B	pH @21.0°C	6.33	pH Units				W149336	DKS	12/02/11 10:15	H3,H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0013		W149303	CFF	12/02/11 12:04	H3
SM 4500-P-E	Phosphorus	0.017	mg/L	0.010	0.004		W150226	SM	12/09/11 15:36	
SM 5310B	Total Organic Carbon	4.87	mg/L	1.00	0.18		W150162	SM	12/07/11 22:43	



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

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Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0012**

Reported: 21-Dec-11 09:50

Client Sample ID: **11162011SW001**

SVL Sample ID: **W1L0012-01 (Surface Water)**

Sample Report Page 3 of 3

Sampled: 16-Nov-11 10:30

Received: 01-Dec-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	3.91	mg/L	0.20	0.07		W150230	AEW	12/08/11 19:27	
EPA 300.0	Fluoride	< 0.10	mg/L	0.10	0.02		W150230	AEW	12/08/11 19:27	
EPA 300.0	Sulfate as SO4	0.58	mg/L	0.30	0.04		W150230	AEW	12/08/11 19:27	

Cation/Anion Balance and TDS Ratios

Cation Sum: 0.33 meq/L Anion Sum: 0.30 meq/L C/A Balance: 6.01 % Calculated TDS: 28 TDS/cTDS: 0.97 TDS/eC: 0.89

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: **Suriname - Merian Gold 2011 / 113-93245**

Work Order: **W1L0012**

Reported: 21-Dec-11 09:50

Client Sample ID: **11162011SW002**

SVL Sample ID: **W1L0012-02 (Surface Water)**

Sample Report Page 1 of 3

Sampled: 16-Nov-11 11:00

Received: 01-Dec-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W151086	DJA	12/14/11 11:35	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	0.086	mg/L	0.080	0.008		W149315	TJK	12/14/11 11:11	
EPA 200.7	Barium	0.0059	mg/L	0.0020	0.0002		W149315	TJK	12/14/11 11:12	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0002		W149315	TJK	12/14/11 11:11	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W149315	TJK	12/14/11 11:11	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0002		W149315	TJK	12/14/11 11:12	
EPA 200.7	Calcium	0.992	mg/L	0.040	0.006		W149315	TJK	12/14/11 11:11	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0003		W149315	TJK	12/14/11 11:12	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W149315	TJK	12/14/11 11:12	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.002		W149315	TJK	12/14/11 11:12	
EPA 200.7	Iron	3.06	mg/L	0.060	0.008		W149315	TJK	12/14/11 11:11	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0017		W149315	TJK	12/14/11 11:12	
EPA 200.7	Magnesium	1.24	mg/L	0.060	0.010		W149315	TJK	12/14/11 11:11	
EPA 200.7	Manganese	0.0181	mg/L	0.0040	0.0006		W149315	TJK	12/14/11 11:11	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.0006		W149315	TJK	12/14/11 11:12	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W149315	TJK	12/14/11 11:12	
EPA 200.7	Potassium	0.57	mg/L	0.50	0.03		W149315	TJK	12/14/11 11:10	
EPA 200.7	Silicon	4.41	mg/L	0.08	0.01		W149315	TJK	12/14/11 11:11	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0003		W149315	TJK	12/14/11 11:12	
EPA 200.7	Sodium	3.11	mg/L	0.50	0.02		W149315	TJK	12/14/11 11:10	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0002		W149315	TJK	12/14/11 11:12	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0002		W149315	TJK	12/14/11 11:12	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0010		W149315	TJK	12/14/11 11:12	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00009	2.5	W150013	KWH	12/08/11 09:06	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0006	2.5	W150013	KWH	12/08/11 09:06	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00070	2.5	W150013	KWH	12/08/11 09:06	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000015	2.5	W150013	KWH	12/08/11 09:06	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000011	2.5	W150013	KWH	12/08/11 09:06	
SM 2340B	Hardness (as CaCO3)	7.59	mg/L	0.347	0.058		N/A		12/14/11 11:11	



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0012**

Reported: 21-Dec-11 09:50

Client Sample ID: **11162011SW002**

Sampled: 16-Nov-11 11:00

SVL Sample ID: **W1L0012-02 (Surface Water)**

Received: 01-Dec-11

Sample Report Page 2 of 3

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.016		W149313	TJK	12/14/11 12:53	
EPA 200.7	Barium	0.0050	mg/L	0.0020	0.0004		W149313	TJK	12/14/11 12:55	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0004		W149313	TJK	12/14/11 12:53	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W149313	TJK	12/14/11 12:53	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W149313	TJK	12/14/11 12:55	
EPA 200.7	Calcium	0.988	mg/L	0.040	0.012		W149313	TJK	12/14/11 12:53	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W149313	TJK	12/14/11 12:55	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W149313	TJK	12/14/11 12:55	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.003		W149313	TJK	12/14/11 12:54	
EPA 200.7	Iron	1.11	mg/L	0.060	0.017		W149313	TJK	12/14/11 12:53	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0034		W149313	TJK	12/14/11 12:55	
EPA 200.7	Magnesium	1.12	mg/L	0.060	0.021		W149313	TJK	12/14/11 12:53	
EPA 200.7	Manganese	0.0125	mg/L	0.0040	0.0011		W149313	TJK	12/14/11 12:53	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W149313	TJK	12/14/11 12:55	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W149313	TJK	12/14/11 12:55	
EPA 200.7	Potassium	< 0.50	mg/L	0.50	0.07		W149313	TJK	12/14/11 12:53	
EPA 200.7	Silicon	4.04	mg/L	0.08	0.03		W149313	TJK	12/14/11 12:53	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0005		W149313	TJK	12/14/11 12:55	
EPA 200.7	Sodium	2.92	mg/L	0.50	0.04		W149313	TJK	12/14/11 12:53	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W149313	TJK	12/14/11 12:55	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W149313	TJK	12/14/11 12:54	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0021		W149313	TJK	12/14/11 12:55	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00007		W150023	KWH	12/08/11 07:16	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0005		W150023	KWH	12/08/11 07:16	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00056		W150023	KWH	12/08/11 07:16	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000012		W150023	KWH	12/08/11 07:16	
Classical Chemistry Parameters										
ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0009		W149304	CFF	12/02/11 10:38	H3
EPA 120.1	Specific conductance	30.7	µmhos/cm	5.00			W149331	JMS	12/02/11 11:32	
EPA 180.1	Turbidity	6.80	NTU	0.100			W149342	SM	12/02/11 10:52	H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0024		W149300	CFF	12/02/11 11:05	H3
EPA 350.1	Ammonia as N	0.034	mg/L	0.030	0.009		W149297	RHW	12/06/11 10:40	
EPA 353.2	Nitrate/Nitrite as N	0.098	mg/L	0.050	0.015		W150267	RHW	12/14/11 10:32	
EPA 410.4	Chemical Oxygen Demand	14.3	mg/L	5.0	2.1		W150121	SM	12/12/11 10:47	
SM 2320B/2310B	Bicarbonate	6.6	mg/L	1.0	0.5		W149336	DKS	12/02/11 10:23	H3
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.5		W149336	DKS	12/02/11 10:23	H3
SM 2320B/2310B	Total Alkalinity	6.6	mg/L	1.0	0.5		W149336	DKS	12/02/11 10:23	H3
SM 2540 C	Total Diss. Solids	23	mg/L	10			W149323	JMS	12/06/11 10:51	H3
SM 2540 D	Total Susp. Solids	< 5.0	mg/L	5.0			W149321	JMS	12/06/11 10:51	H3
SM 4500 H B	pH @20.0°C	6.35	pH Units				W149336	DKS	12/02/11 10:23	H3,H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0013		W149303	CFF	12/02/11 12:06	H3
SM 4500-P-E	Phosphorus	< 0.010	mg/L	0.010	0.004		W150226	SM	12/09/11 15:36	
SM 5310B	Total Organic Carbon	3.97	mg/L	1.00	0.18		W150162	SM	12/07/11 23:40	



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

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Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0012**

Reported: 21-Dec-11 09:50

Client Sample ID: **11162011SW002**

SVL Sample ID: **W1L0012-02 (Surface Water)**

Sample Report Page 3 of 3

Sampled: 16-Nov-11 11:00

Received: 01-Dec-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	4.36	mg/L	0.20	0.07		W150230	AEW	12/08/11 19:54	
EPA 300.0	Fluoride	< 0.10	mg/L	0.10	0.02		W150230	AEW	12/08/11 19:54	
EPA 300.0	Sulfate as SO4	0.47	mg/L	0.30	0.04		W150230	AEW	12/08/11 19:54	

Cation/Anion Balance and TDS Ratios

Cation Sum: 0.31 meq/L Anion Sum: 0.27 meq/L C/A Balance: 7.13 % Calculated TDS: 26 TDS/cTDS: 0.88 TDS/eC: 0.75

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: W1L0012

Reported: 21-Dec-11 09:50

Client Sample ID: 11162011SW003

SVL Sample ID: W1L0012-03 (Surface Water)

Sample Report Page 1 of 3

Sampled: 16-Nov-11 12:00

Received: 01-Dec-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W151086	DJA	12/14/11 11:36	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	0.527	mg/L	0.080	0.008		W149315	TJK	12/14/11 11:16	
EPA 200.7	Barium	0.0075	mg/L	0.0020	0.0002		W149315	TJK	12/14/11 11:18	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0002		W149315	TJK	12/14/11 11:16	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W149315	TJK	12/14/11 11:16	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0002		W149315	TJK	12/14/11 11:18	
EPA 200.7	Calcium	0.791	mg/L	0.040	0.006		W149315	TJK	12/14/11 11:16	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0003		W149315	TJK	12/14/11 11:17	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W149315	TJK	12/14/11 11:18	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.002		W149315	TJK	12/14/11 11:17	
EPA 200.7	Iron	3.69	mg/L	0.060	0.008		W149315	TJK	12/14/11 11:16	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0017		W149315	TJK	12/14/11 11:18	
EPA 200.7	Magnesium	1.19	mg/L	0.060	0.010		W149315	TJK	12/14/11 11:16	
EPA 200.7	Manganese	0.0208	mg/L	0.0040	0.0006		W149315	TJK	12/14/11 11:16	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.0006		W149315	TJK	12/14/11 11:18	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W149315	TJK	12/14/11 11:18	
EPA 200.7	Potassium	0.68	mg/L	0.50	0.03		W149315	TJK	12/14/11 11:16	
EPA 200.7	Silicon	4.22	mg/L	0.08	0.01		W149315	TJK	12/14/11 11:16	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0003		W149315	TJK	12/14/11 11:17	
EPA 200.7	Sodium	2.95	mg/L	0.50	0.02		W149315	TJK	12/14/11 11:16	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0002		W149315	TJK	12/14/11 11:17	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0002		W149315	TJK	12/14/11 11:17	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0010		W149315	TJK	12/14/11 11:18	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00009	2.5	W150013	KWH	12/08/11 09:19	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0006	2.5	W150013	KWH	12/08/11 09:19	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00070	2.5	W150013	KWH	12/08/11 09:19	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000015	2.5	W150013	KWH	12/08/11 09:19	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000011	2.5	W150013	KWH	12/08/11 09:19	
SM 2340B	Hardness (as CaCO3)	6.87	mg/L	0.347	0.058		N/A		12/14/11 11:16	



Golder Associates (WA)
 18300 NE Union Hill Road, Suite 200
 Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0012**

Reported: 21-Dec-11 09:50

Client Sample ID: **11162011SW003**

Sampled: 16-Nov-11 12:00

SVL Sample ID: **W1L0012-03 (Surface Water)**

Received: 01-Dec-11

Sample Report Page 2 of 3

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Dissolved)

EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.016		W149313	TJK	12/14/11 12:59	
EPA 200.7	Barium	0.0044	mg/L	0.0020	0.0004		W149313	TJK	12/14/11 13:00	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0004		W149313	TJK	12/14/11 12:59	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W149313	TJK	12/14/11 12:59	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W149313	TJK	12/14/11 13:00	
EPA 200.7	Calcium	0.779	mg/L	0.040	0.012		W149313	TJK	12/14/11 12:59	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W149313	TJK	12/14/11 13:00	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W149313	TJK	12/14/11 13:00	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.003		W149313	TJK	12/14/11 13:00	
EPA 200.7	Iron	0.762	mg/L	0.060	0.017		W149313	TJK	12/14/11 12:59	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0034		W149313	TJK	12/14/11 13:00	
EPA 200.7	Magnesium	1.03	mg/L	0.060	0.021		W149313	TJK	12/14/11 12:59	
EPA 200.7	Manganese	0.0153	mg/L	0.0040	0.0011		W149313	TJK	12/14/11 12:59	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W149313	TJK	12/14/11 13:00	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W149313	TJK	12/14/11 13:00	
EPA 200.7	Potassium	0.51	mg/L	0.50	0.07		W149313	TJK	12/14/11 12:59	
EPA 200.7	Silicon	3.57	mg/L	0.08	0.03		W149313	TJK	12/14/11 12:59	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0005		W149313	TJK	12/14/11 13:00	
EPA 200.7	Sodium	2.73	mg/L	0.50	0.04		W149313	TJK	12/14/11 12:59	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W149313	TJK	12/14/11 13:00	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W149313	TJK	12/14/11 13:00	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0021		W149313	TJK	12/14/11 13:00	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00007		W150023	KWH	12/08/11 07:18	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0005		W150023	KWH	12/08/11 07:18	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00056		W150023	KWH	12/08/11 07:18	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000012		W150023	KWH	12/08/11 07:18	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0009		W149304	CFF	12/02/11 10:40	H3
EPA 120.1	Specific conductance	28.5	µmhos/cm	5.00			W149331	JMS	12/02/11 11:32	
EPA 180.1	Turbidity	28.4	NTU	0.100			W149342	SM	12/02/11 10:52	H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0024		W149300	CFF	12/02/11 11:07	H3
EPA 350.1	Ammonia as N	0.065	mg/L	0.030	0.009		W149297	RHW	12/06/11 10:42	
EPA 353.2	Nitrate/Nitrite as N	0.335	mg/L	0.050	0.015		W150267	RHW	12/14/11 10:34	
EPA 410.4	Chemical Oxygen Demand	22.8	mg/L	5.0	2.1		W150121	SM	12/12/11 10:47	
SM 2320B/2310B	Bicarbonate	5.0	mg/L	1.0	0.5		W149336	DKS	12/02/11 10:31	H3
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.5		W149336	DKS	12/02/11 10:31	H3
SM 2320B/2310B	Total Alkalinity	5.0	mg/L	1.0	0.5		W149336	DKS	12/02/11 10:31	H3
SM 2540 C	Total Diss. Solids	32	mg/L	10			W149323	JMS	12/06/11 10:51	H3
SM 2540 D	Total Susp. Solids	27.0	mg/L	5.0			W149321	JMS	12/06/11 10:51	H3
SM 4500 H B	pH @20.0°C	6.09	pH Units				W149336	DKS	12/02/11 10:31	H3,H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0013		W149303	CFF	12/02/11 12:14	H3
SM 4500-P-E	Phosphorus	0.010	mg/L	0.010	0.004		W150226	SM	12/09/11 15:36	
SM 5310B	Total Organic Carbon	6.05	mg/L	1.00	0.18		W150162	SM	12/07/11 23:52	



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

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Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0012**

Reported: 21-Dec-11 09:50

Client Sample ID: **11162011SW003**

SVL Sample ID: **W1L0012-03 (Surface Water)**

Sample Report Page 3 of 3

Sampled: 16-Nov-11 12:00

Received: 01-Dec-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	4.24	mg/L	0.20	0.07		W150230	AEW	12/08/11 20:03	
EPA 300.0	Fluoride	< 0.10	mg/L	0.10	0.02		W150230	AEW	12/08/11 20:03	
EPA 300.0	Sulfate as SO4	0.47	mg/L	0.30	0.04		W150230	AEW	12/08/11 20:03	

Cation/Anion Balance and TDS Ratios

Cation Sum: 0.29 meq/L Anion Sum: 0.25 meq/L C/A Balance: 6.50 % Calculated TDS: 25 TDS/cTDS: 1.28 TDS/eC: 1.12

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: W1L0012

Reported: 21-Dec-11 09:50

Client Sample ID: 11182011SW004

SVL Sample ID: W1L0012-04 (Surface Water)

Sample Report Page 1 of 3

Sampled: 18-Nov-11 09:25

Received: 01-Dec-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W151086	DJA	12/14/11 11:38	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	22.0	mg/L	0.080	0.008		W149315	TJK	12/14/11 11:39	
EPA 200.7	Barium	0.0785	mg/L	0.0020	0.0002		W149315	TJK	12/14/11 11:40	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0002		W149315	TJK	12/14/11 11:39	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W149315	TJK	12/14/11 11:39	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0002		W149315	TJK	12/14/11 11:40	
EPA 200.7	Calcium	1.21	mg/L	0.040	0.006		W149315	TJK	12/14/11 11:39	
EPA 200.7	Chromium	0.145	mg/L	0.0060	0.0003		W149315	TJK	12/14/11 11:40	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W149315	TJK	12/14/11 11:40	
EPA 200.7	Copper	0.061	mg/L	0.010	0.002		W149315	TJK	12/14/11 11:40	
EPA 200.7	Iron	36.3	mg/L	0.060	0.008		W149315	TJK	12/14/11 11:39	
EPA 200.7	Lead	0.0129	mg/L	0.0075	0.0017		W149315	TJK	12/14/11 11:40	
EPA 200.7	Magnesium	1.62	mg/L	0.060	0.010		W149315	TJK	12/14/11 11:39	
EPA 200.7	Manganese	0.255	mg/L	0.0040	0.0006		W149315	TJK	12/14/11 11:39	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.0006		W149315	TJK	12/14/11 11:40	
EPA 200.7	Nickel	0.027	mg/L	0.010	0.002		W149315	TJK	12/14/11 11:40	
EPA 200.7	Potassium	1.47	mg/L	0.50	0.03		W149315	TJK	12/14/11 11:39	
EPA 200.7	Silicon	19.3	mg/L	0.08	0.01		W149315	TJK	12/14/11 11:39	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0003		W149315	TJK	12/14/11 11:40	
EPA 200.7	Sodium	2.99	mg/L	0.50	0.02		W149315	TJK	12/14/11 11:39	
EPA 200.7	Titanium	0.0426	mg/L	0.0050	0.0002		W149315	TJK	12/14/11 11:40	
EPA 200.7	Vanadium	0.0970	mg/L	0.0050	0.0002		W149315	TJK	12/14/11 11:40	
EPA 200.7	Zinc	0.0316	mg/L	0.0100	0.0010		W149315	TJK	12/14/11 11:40	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00009	2.5	W150013	KWH	12/08/11 09:20	
EPA 200.8	Arsenic	0.0042	mg/L	0.0030	0.0006	2.5	W150013	KWH	12/08/11 09:20	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00070	2.5	W150013	KWH	12/08/11 09:20	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000015	2.5	W150013	KWH	12/08/11 09:20	
EPA 200.8	Uranium	0.00232	mg/L	0.00100	0.000011	2.5	W150013	KWH	12/08/11 09:20	
SM 2340B	Hardness (as CaCO3)	9.68	mg/L	0.347	0.058		N/A		12/14/11 11:39	



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0012**

Reported: 21-Dec-11 09:50

Client Sample ID: **11182011SW004**

Sampled: 18-Nov-11 09:25

SVL Sample ID: **W1L0012-04 (Surface Water)**

Received: 01-Dec-11

Sample Report Page 2 of 3

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Dissolved)

EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.016		W149313	TJK	12/14/11 13:05	
EPA 200.7	Barium	0.0031	mg/L	0.0020	0.0004		W149313	TJK	12/14/11 13:06	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0004		W149313	TJK	12/14/11 13:05	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W149313	TJK	12/14/11 13:05	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W149313	TJK	12/14/11 13:06	
EPA 200.7	Calcium	0.525	mg/L	0.040	0.012		W149313	TJK	12/14/11 13:05	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W149313	TJK	12/14/11 13:06	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W149313	TJK	12/14/11 13:06	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.003		W149313	TJK	12/14/11 13:06	
EPA 200.7	Iron	0.554	mg/L	0.060	0.017		W149313	TJK	12/14/11 13:05	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0034		W149313	TJK	12/14/11 13:06	
EPA 200.7	Magnesium	0.607	mg/L	0.060	0.021		W149313	TJK	12/14/11 13:05	
EPA 200.7	Manganese	0.0689	mg/L	0.0040	0.0011		W149313	TJK	12/14/11 13:05	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W149313	TJK	12/14/11 13:06	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W149313	TJK	12/14/11 13:06	
EPA 200.7	Potassium	0.50	mg/L	0.50	0.07		W149313	TJK	12/14/11 13:04	
EPA 200.7	Silicon	3.20	mg/L	0.08	0.03		W149313	TJK	12/14/11 13:05	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0005		W149313	TJK	12/14/11 13:06	
EPA 200.7	Sodium	2.88	mg/L	0.50	0.04		W149313	TJK	12/14/11 13:04	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W149313	TJK	12/14/11 13:06	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W149313	TJK	12/14/11 13:06	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0021		W149313	TJK	12/14/11 13:06	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00007		W150023	KWH	12/08/11 07:19	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0005		W150023	KWH	12/08/11 07:19	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00056		W150023	KWH	12/08/11 07:19	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000012		W150023	KWH	12/08/11 07:19	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0009		W149304	CFF	12/02/11 10:42	
EPA 120.1	Specific conductance	26.4	µmhos/cm	5.00			W149331	JMS	12/02/11 11:32	
EPA 180.1	Turbidity	1630	NTU	10.0		100	W149342	SM	12/02/11 10:52	D2,H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0024		W149300	CFF	12/02/11 11:09	
EPA 350.1	Ammonia as N	0.334	mg/L	0.030	0.009		W149297	RHW	12/06/11 10:43	
EPA 353.2	Nitrate/Nitrite as N	0.430	mg/L	0.050	0.015		W150267	RHW	12/14/11 10:35	
EPA 410.4	Chemical Oxygen Demand	111	mg/L	5.0	2.1		W150121	SM	12/12/11 10:47	
SM 2320B/2310B	Bicarbonate	3.5	mg/L	1.0	0.5		W149336	DKS	12/02/11 10:38	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.5		W149336	DKS	12/02/11 10:38	
SM 2320B/2310B	Total Alkalinity	3.5	mg/L	1.0	0.5		W149336	DKS	12/02/11 10:38	
SM 2540 C	Total Diss. Solids	80	mg/L	40			W149323	JMS	12/06/11 10:51	H3
SM 2540 D	Total Susp. Solids	1960	mg/L	20.0			W149321	JMS	12/06/11 10:51	H3
SM 4500 H B	pH @21.0°C	5.91	pH Units				W149336	DKS	12/02/11 10:38	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0013		W149303	CFF	12/02/11 12:16	
SM 4500-P-E	Phosphorus	0.366	mg/L	0.010	0.004		W150226	SM	12/09/11 15:36	
SM 5310B	Total Organic Carbon	8.64	mg/L	1.00	0.18		W150162	SM	12/08/11 00:06	



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

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Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0012**

Reported: 21-Dec-11 09:50

Client Sample ID: **11182011SW004**

SVL Sample ID: **W1L0012-04 (Surface Water)**

Sample Report Page 3 of 3

Sampled: 18-Nov-11 09:25

Received: 01-Dec-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	4.11	mg/L	0.20	0.07		W150230	AEW	12/08/11 20:12	
EPA 300.0	Fluoride	< 0.10	mg/L	0.10	0.02		W150230	AEW	12/08/11 20:12	
EPA 300.0	Sulfate as SO4	1.44	mg/L	0.30	0.04		W150230	AEW	12/08/11 20:12	

Cation/Anion Balance and TDS Ratios

Cation Sum: 0.26 meq/L Anion Sum: 0.25 meq/L C/A Balance: 2.87 % Calculated TDS: 46 TDS/cTDS: 1.74 TDS/eC: 3.03

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

(208) 784-1258

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Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0012**

Reported: 21-Dec-11 09:50

Client Sample ID: **11192011SW005**

SVL Sample ID: **W1L0012-05 (Surface Water)**

Sample Report Page 1 of 1

Sampled: 19-Nov-11 15:20

Received: 01-Dec-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Classical Chemistry Parameters

SM 2540 D	Total Susp. Solids	436	mg/L	5.0			W149321	JMS	12/06/11 10:51	H3
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This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Golder Associates (WA)
 18300 NE Union Hill Road, Suite 200
 Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0012**

Reported: 21-Dec-11 09:50

Client Sample ID: **11202011SW006**

SVL Sample ID: **W1L0012-06 (Surface Water)**

Sample Report Page 1 of 3

Sampled: 20-Nov-11 11:15

Received: 01-Dec-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W151086	DJA	12/14/11 11:41	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	0.395	mg/L	0.080	0.008		W149315	TJK	12/14/11 11:45	
EPA 200.7	Barium	0.0066	mg/L	0.0020	0.0002		W149315	TJK	12/14/11 11:46	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0002		W149315	TJK	12/14/11 11:45	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W149315	TJK	12/14/11 11:45	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0002		W149315	TJK	12/14/11 11:46	
EPA 200.7	Calcium	1.28	mg/L	0.040	0.006		W149315	TJK	12/14/11 11:45	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0003		W149315	TJK	12/14/11 11:46	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W149315	TJK	12/14/11 11:46	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.002		W149315	TJK	12/14/11 11:46	
EPA 200.7	Iron	6.44	mg/L	0.060	0.008		W149315	TJK	12/14/11 11:45	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0017		W149315	TJK	12/14/11 11:46	
EPA 200.7	Magnesium	1.40	mg/L	0.060	0.010		W149315	TJK	12/14/11 11:45	
EPA 200.7	Manganese	0.0479	mg/L	0.0040	0.0006		W149315	TJK	12/14/11 11:45	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.0006		W149315	TJK	12/14/11 11:46	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W149315	TJK	12/14/11 11:46	
EPA 200.7	Potassium	0.86	mg/L	0.50	0.03		W149315	TJK	12/14/11 11:44	
EPA 200.7	Silicon	3.48	mg/L	0.08	0.01		W149315	TJK	12/14/11 11:45	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0003		W149315	TJK	12/14/11 11:46	
EPA 200.7	Sodium	2.89	mg/L	0.50	0.02		W149315	TJK	12/14/11 11:44	
EPA 200.7	Titanium	0.0061	mg/L	0.0050	0.0002		W149315	TJK	12/14/11 11:46	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0002		W149315	TJK	12/14/11 11:46	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0010		W149315	TJK	12/14/11 11:46	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00009	2.5	W150013	KWH	12/08/11 09:22	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0006	2.5	W150013	KWH	12/08/11 09:22	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00070	2.5	W150013	KWH	12/08/11 09:22	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000015	2.5	W150013	KWH	12/08/11 09:22	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000011	2.5	W150013	KWH	12/08/11 09:22	
SM 2340B	Hardness (as CaCO3)	8.97	mg/L	0.347	0.058		N/A		12/14/11 11:45	



Golder Associates (WA)
 18300 NE Union Hill Road, Suite 200
 Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0012**

Reported: 21-Dec-11 09:50

Client Sample ID: **11202011SW006**

Sampled: 20-Nov-11 11:15

SVL Sample ID: **W1L0012-06 (Surface Water)**

Received: 01-Dec-11

Sample Report Page 2 of 3

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Dissolved)

EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.016		W149313	TJK	12/14/11 13:10	
EPA 200.7	Barium	0.0031	mg/L	0.0020	0.0004		W149313	TJK	12/14/11 13:12	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0004		W149313	TJK	12/14/11 13:10	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W149313	TJK	12/14/11 13:10	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W149313	TJK	12/14/11 13:12	
EPA 200.7	Calcium	1.26	mg/L	0.040	0.012		W149313	TJK	12/14/11 13:10	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W149313	TJK	12/14/11 13:12	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W149313	TJK	12/14/11 13:12	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.003		W149313	TJK	12/14/11 13:12	
EPA 200.7	Iron	1.36	mg/L	0.060	0.017		W149313	TJK	12/14/11 13:10	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0034		W149313	TJK	12/14/11 13:12	
EPA 200.7	Magnesium	1.25	mg/L	0.060	0.021		W149313	TJK	12/14/11 13:10	
EPA 200.7	Manganese	0.0290	mg/L	0.0040	0.0011		W149313	TJK	12/14/11 13:10	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W149313	TJK	12/14/11 13:12	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W149313	TJK	12/14/11 13:12	
EPA 200.7	Potassium	0.69	mg/L	0.50	0.07		W149313	TJK	12/14/11 13:10	
EPA 200.7	Silicon	3.01	mg/L	0.08	0.03		W149313	TJK	12/14/11 13:10	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0005		W149313	TJK	12/14/11 13:12	
EPA 200.7	Sodium	2.74	mg/L	0.50	0.04		W149313	TJK	12/14/11 13:10	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W149313	TJK	12/14/11 13:12	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W149313	TJK	12/14/11 13:12	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0021		W149313	TJK	12/14/11 13:12	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00007		W150023	KWH	12/08/11 07:21	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0005		W150023	KWH	12/08/11 07:21	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00056		W150023	KWH	12/08/11 07:21	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000012		W150023	KWH	12/08/11 07:21	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0009		W149304	CFF	12/02/11 10:44	
EPA 120.1	Specific conductance	33.6	µmhos/cm	5.00			W149331	JMS	12/02/11 11:32	
EPA 180.1	Turbidity	47.8	NTU	0.200		2	W149342	SM	12/02/11 10:52	D2,H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0024		W149300	CFF	12/02/11 11:11	
EPA 350.1	Ammonia as N	0.258	mg/L	0.030	0.009		W149297	RHW	12/06/11 10:50	
EPA 353.2	Nitrate/Nitrite as N	0.588	mg/L	0.050	0.015		W150267	RHW	12/14/11 10:36	
EPA 410.4	Chemical Oxygen Demand	22.4	mg/L	5.0	2.1		W150121	SM	12/12/11 10:47	
SM 2320B/2310B	Bicarbonate	7.0	mg/L	1.0	0.5		W149336	DKS	12/02/11 10:44	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.5		W149336	DKS	12/02/11 10:44	
SM 2320B/2310B	Total Alkalinity	7.0	mg/L	1.0	0.5		W149336	DKS	12/02/11 10:44	
SM 2540 C	Total Diss. Solids	36	mg/L	10			W149323	JMS	12/06/11 10:51	H3
SM 2540 D	Total Susp. Solids	15.0	mg/L	5.0			W149321	JMS	12/06/11 10:51	H3
SM 4500 H B	pH @19.0°C	6.29	pH Units				W149336	DKS	12/02/11 10:44	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0013		W149303	CFF	12/02/11 12:18	
SM 4500-P-E	Phosphorus	< 0.010	mg/L	0.010	0.004		W150226	SM	12/09/11 15:36	
SM 5310B	Total Organic Carbon	7.18	mg/L	1.00	0.18		W150162	SM	12/08/11 00:18	



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

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Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0012**

Reported: 21-Dec-11 09:50

Client Sample ID: **11202011SW006**

SVL Sample ID: **W1L0012-06 (Surface Water)**

Sample Report Page 3 of 3

Sampled: 20-Nov-11 11:15

Received: 01-Dec-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	4.47	mg/L	0.20	0.07		W150230	AEW	12/08/11 20:30	
EPA 300.0	Fluoride	< 0.10	mg/L	0.10	0.02		W150230	AEW	12/08/11 20:30	
EPA 300.0	Sulfate as SO4	0.64	mg/L	0.30	0.04		W150230	AEW	12/08/11 20:30	

Cation/Anion Balance and TDS Ratios

Cation Sum: 0.37 meq/L Anion Sum: 0.32 meq/L C/A Balance: 7.22 % Calculated TDS: 27 TDS/cTDS: 1.34 TDS/eC: 1.07

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: W1L0012

Reported: 21-Dec-11 09:50

Client Sample ID: 11202011SW007

SVL Sample ID: W1L0012-07 (Surface Water)

Sample Report Page 1 of 3

Sampled: 20-Nov-11 13:15

Received: 01-Dec-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W151086	DJA	12/14/11 11:43	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	2.63	mg/L	0.080	0.008		W149315	TJK	12/14/11 11:50	
EPA 200.7	Barium	0.0163	mg/L	0.0020	0.0002		W149315	TJK	12/14/11 11:52	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0002		W149315	TJK	12/14/11 11:50	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W149315	TJK	12/14/11 11:50	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0002		W149315	TJK	12/14/11 11:52	
EPA 200.7	Calcium	1.65	mg/L	0.040	0.006		W149315	TJK	12/14/11 11:50	
EPA 200.7	Chromium	0.0092	mg/L	0.0060	0.0003		W149315	TJK	12/14/11 11:51	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W149315	TJK	12/14/11 11:52	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.002		W149315	TJK	12/14/11 11:51	
EPA 200.7	Iron	14.4	mg/L	0.060	0.008		W149315	TJK	12/14/11 11:50	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0017		W149315	TJK	12/14/11 11:52	
EPA 200.7	Magnesium	1.60	mg/L	0.060	0.010		W149315	TJK	12/14/11 11:50	
EPA 200.7	Manganese	0.328	mg/L	0.0040	0.0006		W149315	TJK	12/14/11 11:50	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.0006		W149315	TJK	12/14/11 11:52	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W149315	TJK	12/14/11 11:51	
EPA 200.7	Potassium	1.37	mg/L	0.50	0.03		W149315	TJK	12/14/11 11:50	
EPA 200.7	Silicon	5.97	mg/L	0.08	0.01		W149315	TJK	12/14/11 11:50	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0003		W149315	TJK	12/14/11 11:51	
EPA 200.7	Sodium	5.85	mg/L	0.50	0.02		W149315	TJK	12/14/11 11:50	
EPA 200.7	Titanium	0.0173	mg/L	0.0050	0.0002		W149315	TJK	12/14/11 11:51	
EPA 200.7	Vanadium	0.0062	mg/L	0.0050	0.0002		W149315	TJK	12/14/11 11:51	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0010		W149315	TJK	12/14/11 11:52	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00009	2.5	W150013	KWH	12/08/11 09:23	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0006	2.5	W150013	KWH	12/08/11 09:23	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00070	2.5	W150013	KWH	12/08/11 09:23	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000015	2.5	W150013	KWH	12/08/11 09:23	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000011	2.5	W150013	KWH	12/08/11 09:23	
SM 2340B	Hardness (as CaCO3)	10.7	mg/L	0.347	0.058		N/A		12/14/11 11:50	



Golder Associates (WA)
 18300 NE Union Hill Road, Suite 200
 Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0012**

Reported: 21-Dec-11 09:50

Client Sample ID: **11202011SW007**

Sampled: 20-Nov-11 13:15

SVL Sample ID: **W1L0012-07 (Surface Water)**

Received: 01-Dec-11

Sample Report Page 2 of 3

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Dissolved)

EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.016		W149313	TJK	12/14/11 13:16	
EPA 200.7	Barium	0.0071	mg/L	0.0020	0.0004		W149313	TJK	12/14/11 13:18	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0004		W149313	TJK	12/14/11 13:16	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W149313	TJK	12/14/11 13:16	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W149313	TJK	12/14/11 13:18	
EPA 200.7	Calcium	1.23	mg/L	0.040	0.012		W149313	TJK	12/14/11 13:16	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W149313	TJK	12/14/11 13:18	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W149313	TJK	12/14/11 13:18	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.003		W149313	TJK	12/14/11 13:17	
EPA 200.7	Iron	1.10	mg/L	0.060	0.017		W149313	TJK	12/14/11 13:16	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0034		W149313	TJK	12/14/11 13:18	
EPA 200.7	Magnesium	1.08	mg/L	0.060	0.021		W149313	TJK	12/14/11 13:16	
EPA 200.7	Manganese	0.275	mg/L	0.0040	0.0011		W149313	TJK	12/14/11 13:16	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W149313	TJK	12/14/11 13:18	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W149313	TJK	12/14/11 13:18	
EPA 200.7	Potassium	1.08	mg/L	0.50	0.07		W149313	TJK	12/14/11 13:16	
EPA 200.7	Silicon	3.03	mg/L	0.08	0.03		W149313	TJK	12/14/11 13:16	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0005		W149313	TJK	12/14/11 13:18	
EPA 200.7	Sodium	5.26	mg/L	0.50	0.04		W149313	TJK	12/14/11 13:16	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W149313	TJK	12/14/11 13:18	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W149313	TJK	12/14/11 13:17	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0021		W149313	TJK	12/14/11 13:18	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00007		W150023	KWH	12/08/11 07:22	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0005		W150023	KWH	12/08/11 07:22	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00056		W150023	KWH	12/08/11 07:22	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000012		W150023	KWH	12/08/11 07:22	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0009		W149304	CFE	12/02/11 10:46	
EPA 120.1	Specific conductance	53.6	µmhos/cm	5.00			W149331	JMS	12/02/11 11:32	
EPA 180.1	Turbidity	162	NTU	1.00		10	W149342	SM	12/02/11 10:52	H3,D2
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0024		W149300	CFE	12/02/11 11:19	
EPA 350.1	Ammonia as N	0.904	mg/L	0.030	0.009		W149297	RHW	12/06/11 10:51	
EPA 353.2	Nitrate/Nitrite as N	0.364	mg/L	0.050	0.015		W150267	RHW	12/14/11 10:42	
EPA 410.4	Chemical Oxygen Demand	29.7	mg/L	5.0	2.1		W150121	SM	12/12/11 10:47	
SM 2320B/2310B	Bicarbonate	12.9	mg/L	1.0	0.5		W149336	DKS	12/02/11 10:55	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.5		W149336	DKS	12/02/11 10:55	
SM 2320B/2310B	Total Alkalinity	12.9	mg/L	1.0	0.5		W149336	DKS	12/02/11 10:55	
SM 2540 C	Total Diss. Solids	76	mg/L	10			W149323	JMS	12/06/11 10:51	H3
SM 2540 D	Total Susp. Solids	120	mg/L	5.0			W149321	JMS	12/06/11 10:51	H3
SM 4500 H B	pH @23.0°C	6.58	pH Units				W149336	DKS	12/02/11 10:55	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0013		W149303	CFE	12/02/11 12:20	
SM 4500-P-E	Phosphorus	0.058	mg/L	0.010	0.004		W150226	SM	12/09/11 15:36	
SM 5310B	Total Organic Carbon	9.74	mg/L	1.00	0.18		W150162	SM	12/08/11 00:30	



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Golder Associates (WA)
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Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0012**

Reported: 21-Dec-11 09:50

Client Sample ID: **11202011SW007**

SVL Sample ID: **W1L0012-07 (Surface Water)**

Sample Report Page 3 of 3

Sampled: 20-Nov-11 13:15

Received: 01-Dec-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	5.47	mg/L	0.20	0.07		W150230	AEW	12/08/11 18:05	
EPA 300.0	Fluoride	< 0.10	mg/L	0.10	0.02		W150230	AEW	12/08/11 18:05	
EPA 300.0	Sulfate as SO4	3.18	mg/L	0.30	0.04		W150230	AEW	12/08/11 18:05	

Cation/Anion Balance and TDS Ratios

Cation Sum: 0.52 meq/L Anion Sum: 0.51 meq/L C/A Balance: 1.67 % Calculated TDS: 40 TDS/cTDS: 1.91 TDS/eC: 1.42

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: W1L0012

Reported: 21-Dec-11 09:50

Client Sample ID: 11202011SW008

SVL Sample ID: W1L0012-08 (Surface Water)

Sample Report Page 1 of 3

Sampled: 20-Nov-11 14:40

Received: 01-Dec-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W151086	DJA	12/14/11 11:46	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	2.54	mg/L	0.080	0.008		W149315	TJK	12/14/11 11:56	
EPA 200.7	Barium	0.0162	mg/L	0.0020	0.0002		W149315	TJK	12/14/11 11:57	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0002		W149315	TJK	12/14/11 11:56	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W149315	TJK	12/14/11 11:56	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0002		W149315	TJK	12/14/11 11:57	
EPA 200.7	Calcium	1.59	mg/L	0.040	0.006		W149315	TJK	12/14/11 11:56	
EPA 200.7	Chromium	0.0096	mg/L	0.0060	0.0003		W149315	TJK	12/14/11 11:57	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W149315	TJK	12/14/11 11:57	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.002		W149315	TJK	12/14/11 11:57	
EPA 200.7	Iron	14.5	mg/L	0.060	0.008		W149315	TJK	12/14/11 11:55	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0017		W149315	TJK	12/14/11 11:57	
EPA 200.7	Magnesium	1.62	mg/L	0.060	0.010		W149315	TJK	12/14/11 11:56	
EPA 200.7	Manganese	0.317	mg/L	0.0040	0.0006		W149315	TJK	12/14/11 11:56	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.0006		W149315	TJK	12/14/11 11:57	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W149315	TJK	12/14/11 11:57	
EPA 200.7	Potassium	1.30	mg/L	0.50	0.03		W149315	TJK	12/14/11 11:55	
EPA 200.7	Silicon	6.01	mg/L	0.08	0.01		W149315	TJK	12/14/11 11:56	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0003		W149315	TJK	12/14/11 11:57	
EPA 200.7	Sodium	5.59	mg/L	0.50	0.02		W149315	TJK	12/14/11 11:55	
EPA 200.7	Titanium	0.0135	mg/L	0.0050	0.0002		W149315	TJK	12/14/11 11:57	
EPA 200.7	Vanadium	0.0061	mg/L	0.0050	0.0002		W149315	TJK	12/14/11 11:57	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0010		W149315	TJK	12/14/11 11:57	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00009	2.5	W150013	KWH	12/08/11 09:25	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0006	2.5	W150013	KWH	12/08/11 09:25	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00070	2.5	W150013	KWH	12/08/11 09:25	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000015	2.5	W150013	KWH	12/08/11 09:25	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000011	2.5	W150013	KWH	12/08/11 09:25	
SM 2340B	Hardness (as CaCO3)	10.6	mg/L	0.347	0.058		N/A		12/14/11 11:56	



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0012**

Reported: 21-Dec-11 09:50

Client Sample ID: **11202011SW008**

Sampled: 20-Nov-11 14:40

SVL Sample ID: **W1L0012-08 (Surface Water)**

Received: 01-Dec-11

Sample Report Page 2 of 3

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.016		W149313	TJK	12/14/11 13:34	
EPA 200.7	Barium	0.0073	mg/L	0.0020	0.0004		W149313	TJK	12/14/11 13:36	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0004		W149313	TJK	12/14/11 13:34	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W149313	TJK	12/14/11 13:34	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W149313	TJK	12/14/11 13:36	
EPA 200.7	Calcium	1.41	mg/L	0.040	0.012		W149313	TJK	12/14/11 13:34	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W149313	TJK	12/14/11 13:36	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W149313	TJK	12/14/11 13:36	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.003		W149313	TJK	12/14/11 13:35	
EPA 200.7	Iron	1.43	mg/L	0.060	0.017		W149313	TJK	12/14/11 13:34	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0034		W149313	TJK	12/14/11 13:36	
EPA 200.7	Magnesium	1.22	mg/L	0.060	0.021		W149313	TJK	12/14/11 13:34	
EPA 200.7	Manganese	0.226	mg/L	0.0040	0.0011		W149313	TJK	12/14/11 13:34	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W149313	TJK	12/14/11 13:36	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W149313	TJK	12/14/11 13:36	
EPA 200.7	Potassium	1.07	mg/L	0.50	0.07		W149313	TJK	12/14/11 13:34	
EPA 200.7	Silicon	3.28	mg/L	0.08	0.03		W149313	TJK	12/14/11 13:34	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0005		W149313	TJK	12/14/11 13:36	
EPA 200.7	Sodium	5.20	mg/L	0.50	0.04		W149313	TJK	12/14/11 13:34	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W149313	TJK	12/14/11 13:36	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W149313	TJK	12/14/11 13:35	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0021		W149313	TJK	12/14/11 13:36	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00007		W150023	KWH	12/08/11 07:26	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0005		W150023	KWH	12/08/11 07:26	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00056		W150023	KWH	12/08/11 07:26	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000012		W150023	KWH	12/08/11 07:26	
Classical Chemistry Parameters										
ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0009		W149304	CFE	12/02/11 10:48	
EPA 120.1	Specific conductance	54.4	µmhos/cm	5.00			W149331	JMS	12/02/11 11:32	
EPA 180.1	Turbidity	168	NTU	0.500		5	W149342	SM	12/02/11 10:52	D2,H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0024		W149300	CFE	12/02/11 11:21	
EPA 350.1	Ammonia as N	0.947	mg/L	0.030	0.009		W149297	RHW	12/06/11 10:52	
EPA 353.2	Nitrate/Nitrite as N	0.486	mg/L	0.050	0.015		W150267	RHW	12/14/11 10:44	
EPA 410.4	Chemical Oxygen Demand	16.1	mg/L	5.0	2.1		W150121	SM	12/12/11 10:47	
SM 2320B/2310B	Bicarbonate	12.5	mg/L	1.0	0.5		W149336	DKS	12/02/11 11:06	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.5		W149336	DKS	12/02/11 11:06	
SM 2320B/2310B	Total Alkalinity	12.5	mg/L	1.0	0.5		W149336	DKS	12/02/11 11:06	
SM 2540 C	Total Diss. Solids	63	mg/L	10			W149323	JMS	12/06/11 10:51	H3
SM 2540 D	Total Susp. Solids	131	mg/L	5.0			W149321	JMS	12/06/11 10:51	H3
SM 4500 H B	pH @22.0°C	6.64	pH Units				W149336	DKS	12/02/11 11:06	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0013		W149303	CFE	12/02/11 12:22	
SM 4500-P-E	Phosphorus	0.064	mg/L	0.010	0.004		W150226	SM	12/09/11 15:36	
SM 5310B	Total Organic Carbon	8.73	mg/L	1.00	0.18		W150162	SM	12/08/11 00:48	



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

(208) 784-1258

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Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0012**

Reported: 21-Dec-11 09:50

Client Sample ID: **11202011SW008**

SVL Sample ID: **W1L0012-08 (Surface Water)**

Sample Report Page 3 of 3

Sampled: 20-Nov-11 14:40

Received: 01-Dec-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	5.52	mg/L	0.20	0.07		W150230	AEW	12/08/11 18:14	
EPA 300.0	Fluoride	< 0.10	mg/L	0.10	0.02		W150230	AEW	12/08/11 18:14	
EPA 300.0	Sulfate as SO4	2.84	mg/L	0.30	0.04		W150230	AEW	12/08/11 18:14	

Cation/Anion Balance and TDS Ratios

Cation Sum: 0.55 meq/L Anion Sum: 0.50 meq/L C/A Balance: 5.01 % Calculated TDS: 40 TDS/cTDS: 1.57 TDS/eC: 1.16

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0012**

Reported: 21-Dec-11 09:50

Client Sample ID: **11192011GW001**

SVL Sample ID: **W1L0012-09 (Ground Water)**

Sample Report Page 1 of 2

Sampled: 19-Nov-11 12:30

Received: 01-Dec-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W151086	DJA	12/14/11 11:51	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000011	2.5	W150013	KWH	12/08/11 09:26	
SM 2340B	Hardness (as CaCO3)	59.4	mg/L	0.347	0.116		N/A		12/14/11 13:40	

Metals (Dissolved)

EPA 200.7	Aluminum	0.113	mg/L	0.080	0.016		W149313	TJK	12/14/11 13:40	
EPA 200.7	Barium	0.0178	mg/L	0.0020	0.0004		W149313	TJK	12/14/11 13:42	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0004		W149313	TJK	12/14/11 13:40	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W149313	TJK	12/14/11 13:40	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W149313	TJK	12/14/11 13:42	
EPA 200.7	Calcium	11.1	mg/L	0.040	0.012		W149313	TJK	12/14/11 13:40	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W149313	TJK	12/14/11 13:42	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W149313	TJK	12/14/11 13:42	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.003		W149313	TJK	12/14/11 13:41	
EPA 200.7	Iron	1.06	mg/L	0.060	0.017		W149313	TJK	12/14/11 13:40	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0034		W149313	TJK	12/14/11 13:42	
EPA 200.7	Magnesium	7.69	mg/L	0.060	0.021		W149313	TJK	12/14/11 13:40	
EPA 200.7	Manganese	0.478	mg/L	0.0040	0.0011		W149313	TJK	12/14/11 13:40	
EPA 200.7	Molybdenum	0.009	mg/L	0.008	0.001		W149313	TJK	12/14/11 13:42	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W149313	TJK	12/14/11 13:42	
EPA 200.7	Potassium	0.98	mg/L	0.50	0.07		W149313	TJK	12/14/11 13:40	
EPA 200.7	Silicon	33.3	mg/L	0.08	0.03		W149313	TJK	12/14/11 13:40	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0005		W149313	TJK	12/14/11 13:42	
EPA 200.7	Sodium	27.8	mg/L	0.50	0.04		W149313	TJK	12/14/11 13:40	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W149313	TJK	12/14/11 13:42	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W149313	TJK	12/14/11 13:41	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0021		W149313	TJK	12/14/11 13:42	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00007		W150023	KWH	12/08/11 07:28	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0005		W150023	KWH	12/08/11 07:28	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00056		W150023	KWH	12/08/11 07:28	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000012		W150023	KWH	12/08/11 07:28	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0009		W149304	CFE	12/02/11 10:50	
EPA 120.1	Specific conductance	235	µmhos/cm	5.00			W149331	JMS	12/02/11 11:32	
EPA 180.1	Turbidity	15.2	NTU	0.100			W149342	SM	12/02/11 10:52	H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0024		W149300	CFE	12/02/11 11:23	
EPA 350.1	Ammonia as N	0.257	mg/L	0.030	0.009		W149297	RHW	12/06/11 10:54	
EPA 353.2	Nitrate/Nitrite as N	0.052	mg/L	0.050	0.015		W150267	RHW	12/14/11 10:45	
SM 2320B/2310B	Bicarbonate	108	mg/L	1.0	0.5		W149336	DKS	12/02/11 11:17	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.5		W149336	DKS	12/02/11 11:17	
SM 2320B/2310B	Total Alkalinity	108	mg/L	1.0	0.5		W149336	DKS	12/02/11 11:17	
SM 2540 C	Total Diss. Solids	181	mg/L	10			W149323	JMS	12/06/11 10:51	H3
SM 2540 D	Total Susp. Solids	34.0	mg/L	5.0			W149321	JMS	12/06/11 10:51	H3
SM 4500 H B	pH @22.0°C	6.95	pH Units				W149336	DKS	12/02/11 11:17	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0013		W149303	CFE	12/02/11 12:24	
SM 4500-P-E	Phosphorus	0.292	mg/L	0.010	0.004		W150226	SM	12/09/11 15:36	



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

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Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0012**

Reported: 21-Dec-11 09:50

Client Sample ID: **11192011GW001**

SVL Sample ID: **W1L0012-09 (Ground Water)**

Sample Report Page 2 of 2

Sampled: 19-Nov-11 12:30

Received: 01-Dec-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	10.1	mg/L	0.20	0.07		W150230	AEW	12/08/11 18:23	
EPA 300.0	Fluoride	0.24	mg/L	0.10	0.02		W150230	AEW	12/08/11 18:23	
EPA 300.0	Sulfate as SO4	4.97	mg/L	0.30	0.04		W150230	AEW	12/08/11 18:23	

Cation/Anion Balance and TDS Ratios

Cation Sum: 2.51 meq/L Anion Sum: 2.56 meq/L C/A Balance: -1.08 % Calculated TDS: 218 TDS/cTDS: 0.83 TDS/eC: 0.77

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: **Suriname - Merian Gold 2011 / 113-93245**

Work Order: **W1L0012**

Reported: 21-Dec-11 09:50

Client Sample ID: **11192011GW002**

SVL Sample ID: **W1L0012-10 (Ground Water)**

Sample Report Page 1 of 2

Sampled: 19-Nov-11 14:30

Received: 01-Dec-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W151086	DJA	12/14/11 11:53	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000011	2.5	W150013	KWH	12/08/11 09:28	
SM 2340B	Hardness (as CaCO3)	16.4	mg/L	0.347	0.116		N/A		12/14/11 13:46	

Metals (Dissolved)

EPA 200.7	Aluminum	0.109	mg/L	0.080	0.016		W149313	TJK	12/14/11 13:46	
EPA 200.7	Barium	0.0183	mg/L	0.020	0.0004		W149313	TJK	12/14/11 13:47	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0004		W149313	TJK	12/14/11 13:46	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W149313	TJK	12/14/11 13:46	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W149313	TJK	12/14/11 13:47	
EPA 200.7	Calcium	2.88	mg/L	0.040	0.012		W149313	TJK	12/14/11 13:46	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W149313	TJK	12/14/11 13:47	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W149313	TJK	12/14/11 13:47	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.003		W149313	TJK	12/14/11 13:47	
EPA 200.7	Iron	0.168	mg/L	0.060	0.017		W149313	TJK	12/14/11 13:46	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0034		W149313	TJK	12/14/11 13:47	
EPA 200.7	Magnesium	2.24	mg/L	0.060	0.021		W149313	TJK	12/14/11 13:46	
EPA 200.7	Manganese	0.131	mg/L	0.0040	0.0011		W149313	TJK	12/14/11 13:46	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W149313	TJK	12/14/11 13:47	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W149313	TJK	12/14/11 13:47	
EPA 200.7	Potassium	0.76	mg/L	0.50	0.07		W149313	TJK	12/14/11 13:46	
EPA 200.7	Silicon	11.3	mg/L	0.08	0.03		W149313	TJK	12/14/11 13:46	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0005		W149313	TJK	12/14/11 13:47	
EPA 200.7	Sodium	8.57	mg/L	0.50	0.04		W149313	TJK	12/14/11 13:46	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W149313	TJK	12/14/11 13:47	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W149313	TJK	12/14/11 13:47	
EPA 200.7	Zinc	0.0306	mg/L	0.0100	0.0021		W149313	TJK	12/14/11 13:47	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00007		W150023	KWH	12/08/11 07:29	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0005		W150023	KWH	12/08/11 07:29	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00056		W150023	KWH	12/08/11 07:29	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000012		W150023	KWH	12/08/11 07:29	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0009		W149304	CFE	12/02/11 10:52	
EPA 120.1	Specific conductance	73.6	µmhos/cm	5.00			W149331	JMS	12/02/11 11:32	
EPA 180.1	Turbidity	5.63	NTU	0.100			W149342	SM	12/02/11 10:52	H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0024		W149300	CFE	12/02/11 11:25	
EPA 350.1	Ammonia as N	0.206	mg/L	0.030	0.009		W149297	RHW	12/06/11 10:55	
EPA 353.2	Nitrate/Nitrite as N	0.261	mg/L	0.050	0.015		W150267	RHW	12/14/11 10:46	
SM 2320B/2310B	Bicarbonate	30.0	mg/L	1.0	0.5		W149336	DKS	12/02/11 12:03	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.5		W149336	DKS	12/02/11 12:03	
SM 2320B/2310B	Total Alkalinity	30.0	mg/L	1.0	0.5		W149336	DKS	12/02/11 12:03	
SM 2540 C	Total Diss. Solids	59	mg/L	10			W149323	JMS	12/06/11 10:51	H3
SM 2540 D	Total Susp. Solids	15.0	mg/L	5.0			W149321	JMS	12/06/11 10:51	H3
SM 4500 H B	pH @22.0°C	6.09	pH Units				W149336	DKS	12/02/11 12:03	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0013		W149303	CFE	12/02/11 12:26	
SM 4500-P-E	Phosphorus	0.029	mg/L	0.010	0.004		W150226	SM	12/09/11 15:36	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268

Work order Report Page 27 of 38



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

(208) 784-1258

Fax (208) 783-0891

Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0012**

Reported: 21-Dec-11 09:50

Client Sample ID: **11192011GW002**

SVL Sample ID: **W1L0012-10 (Ground Water)**

Sample Report Page 2 of 2

Sampled: 19-Nov-11 14:30

Received: 01-Dec-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	4.33	mg/L	0.20	0.07		W150230	AEW	12/08/11 18:41	
EPA 300.0	Fluoride	< 0.10	mg/L	0.10	0.02		W150230	AEW	12/08/11 18:41	
EPA 300.0	Sulfate as SO4	2.02	mg/L	0.30	0.04		W150230	AEW	12/08/11 18:41	

Cation/Anion Balance and TDS Ratios

Cation Sum: 0.76 meq/L Anion Sum: 0.78 meq/L C/A Balance: -1.58 % Calculated TDS: 71 TDS/cTDS: 0.84 TDS/eC: 0.80

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

(208) 784-1258

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Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0012**

Reported: 21-Dec-11 09:50

Client Sample ID: **11152011SW009**

SVL Sample ID: **W1L0012-11 (Surface Water)**

Sample Report Page 1 of 1

Sampled: 15-Nov-11 14:00

Received: 01-Dec-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Classical Chemistry Parameters

SM 2540 D	Total Susp. Solids	2080	mg/L	20.0			W149321	JMS	12/06/11 10:51	H3
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This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

(208) 784-1258

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Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0012**

Reported: 21-Dec-11 09:50

Client Sample ID: **11152011SW010**

SVL Sample ID: **W1L0012-12 (Surface Water)**

Sample Report Page 1 of 1

Sampled: 15-Nov-11 11:30

Received: 01-Dec-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Classical Chemistry Parameters

SM 2540 D	Total Susp. Solids	< 5.0	mg/L	5.0			W149321	JMS	12/06/11 10:51	H3
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This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: W1L0012

Reported: 21-Dec-11 09:50

Quality Control - BLANK Data

Method	Analyte	Units	Result	MDL	MRL	Batch ID	Analyzed	Notes
Metals (Total)								
EPA 245.1	Mercury	mg/L	<0.00020	0.000072	0.00020	W151086	14-Dec-11	
Metals (Total Recoverable--reportable as Total per 40 CFR 136)								
EPA 200.7	Aluminum	mg/L	<0.080	0.008	0.080	W149315	14-Dec-11	
EPA 200.7	Barium	mg/L	<0.0020	0.0002	0.0020	W149315	14-Dec-11	
EPA 200.7	Beryllium	mg/L	<0.0020	0.0002	0.0020	W149315	14-Dec-11	
EPA 200.7	Boron	mg/L	<0.040	0.005	0.040	W149315	14-Dec-11	
EPA 200.7	Cadmium	mg/L	<0.0020	0.0002	0.0020	W149315	14-Dec-11	
EPA 200.7	Calcium	mg/L	<0.040	0.006	0.040	W149315	14-Dec-11	
EPA 200.7	Chromium	mg/L	<0.0060	0.0003	0.0060	W149315	14-Dec-11	
EPA 200.7	Cobalt	mg/L	<0.0060	0.0005	0.0060	W149315	14-Dec-11	
EPA 200.7	Copper	mg/L	<0.010	0.002	0.010	W149315	14-Dec-11	
EPA 200.7	Iron	mg/L	<0.060	0.008	0.060	W149315	14-Dec-11	
EPA 200.7	Lead	mg/L	<0.0075	0.0017	0.0075	W149315	14-Dec-11	
EPA 200.7	Magnesium	mg/L	<0.060	0.010	0.060	W149315	14-Dec-11	
EPA 200.7	Manganese	mg/L	<0.0040	0.0006	0.0040	W149315	14-Dec-11	
EPA 200.7	Molybdenum	mg/L	<0.008	0.0006	0.008	W149315	14-Dec-11	
EPA 200.7	Nickel	mg/L	<0.010	0.002	0.010	W149315	14-Dec-11	
EPA 200.7	Potassium	mg/L	<0.50	0.03	0.50	W149315	14-Dec-11	
EPA 200.7	Silicon	mg/L	<0.08	0.01	0.08	W149315	14-Dec-11	
EPA 200.7	Silver	mg/L	<0.0050	0.0003	0.0050	W149315	14-Dec-11	
EPA 200.7	Sodium	mg/L	<0.50	0.02	0.50	W149315	14-Dec-11	
EPA 200.7	Titanium	mg/L	<0.0050	0.0002	0.0050	W149315	14-Dec-11	
EPA 200.7	Vanadium	mg/L	<0.0050	0.0002	0.0050	W149315	14-Dec-11	
EPA 200.7	Zinc	mg/L	<0.0100	0.0010	0.0100	W149315	14-Dec-11	
EPA 200.8	Antimony	mg/L	<0.00300	0.00009	0.00300	W150013	08-Dec-11	
EPA 200.8	Arsenic	mg/L	<0.0030	0.0006	0.0030	W150013	08-Dec-11	
EPA 200.8	Selenium	mg/L	<0.00300	0.00070	0.00300	W150013	08-Dec-11	
EPA 200.8	Uranium	mg/L	<0.00100	0.000011	0.00100	W150013	08-Dec-11	
EPA 200.8	Thallium	mg/L	<0.00100	0.000015	0.00100	W150013	08-Dec-11	
Metals (Dissolved)								
EPA 200.7	Aluminum	mg/L	<0.080	0.016	0.080	W149313	14-Dec-11	
EPA 200.7	Barium	mg/L	<0.0020	0.0004	0.0020	W149313	14-Dec-11	
EPA 200.7	Beryllium	mg/L	<0.0020	0.0004	0.0020	W149313	14-Dec-11	
EPA 200.7	Boron	mg/L	<0.040	0.010	0.040	W149313	14-Dec-11	
EPA 200.7	Cadmium	mg/L	<0.0020	0.0005	0.0020	W149313	14-Dec-11	
EPA 200.7	Calcium	mg/L	<0.040	0.012	0.040	W149313	14-Dec-11	
EPA 200.7	Chromium	mg/L	<0.0060	0.0006	0.0060	W149313	14-Dec-11	
EPA 200.7	Cobalt	mg/L	<0.0060	0.0009	0.0060	W149313	14-Dec-11	
EPA 200.7	Copper	mg/L	<0.010	0.003	0.010	W149313	14-Dec-11	
EPA 200.7	Iron	mg/L	<0.060	0.017	0.060	W149313	14-Dec-11	
EPA 200.7	Lead	mg/L	<0.0075	0.0034	0.0075	W149313	14-Dec-11	
EPA 200.7	Magnesium	mg/L	<0.060	0.021	0.060	W149313	14-Dec-11	
EPA 200.7	Manganese	mg/L	<0.0040	0.0011	0.0040	W149313	14-Dec-11	
EPA 200.7	Molybdenum	mg/L	<0.008	0.001	0.008	W149313	14-Dec-11	
EPA 200.7	Nickel	mg/L	<0.010	0.003	0.010	W149313	14-Dec-11	
EPA 200.7	Potassium	mg/L	<0.50	0.07	0.50	W149313	14-Dec-11	
EPA 200.7	Silicon	mg/L	<0.08	0.03	0.08	W149313	14-Dec-11	
EPA 200.7	Silver	mg/L	<0.0050	0.0005	0.0050	W149313	14-Dec-11	
EPA 200.7	Sodium	mg/L	<0.50	0.04	0.50	W149313	14-Dec-11	
EPA 200.7	Titanium	mg/L	<0.0050	0.0003	0.0050	W149313	14-Dec-11	
EPA 200.7	Vanadium	mg/L	<0.0050	0.0005	0.0050	W149313	14-Dec-11	
EPA 200.7	Zinc	mg/L	<0.0100	0.0021	0.0100	W149313	14-Dec-11	
EPA 200.8	Antimony	mg/L	<0.00300	0.00007	0.00300	W150023	08-Dec-11	
EPA 200.8	Arsenic	mg/L	<0.0030	0.0005	0.0030	W150023	08-Dec-11	
EPA 200.8	Selenium	mg/L	<0.00300	0.00056	0.00300	W150023	08-Dec-11	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268

Work order Report Page 31 of 38



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245
Work Order: **W1L0012**
Reported: 21-Dec-11 09:50

Quality Control - BLANK Data (Continued)

Method	Analyte	Units	Result	MDL	MRL	Batch ID	Analyzed	Notes
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Metals (Dissolved) (Continued)

EPA 200.8	Thallium	mg/L	<0.00100	0.000012	0.00100	W150023	08-Dec-11	
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Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	mg/L	<0.005	0.0009	0.005	W149304	02-Dec-11	
EPA 120.1	Specific conductance	µmhos/cm	<5.00		5.00	W149331	02-Dec-11	
EPA 180.1	Turbidity	NTU	<0.100		0.100	W149342	02-Dec-11	
EPA 335.4	Cyanide (total)	mg/L	<0.0100	0.0024	0.0100	W149300	02-Dec-11	
EPA 350.1	Ammonia as N	mg/L	<0.030	0.009	0.030	W149297	06-Dec-11	
EPA 353.2	Nitrate/Nitrite as N	mg/L	<0.050	0.015	0.050	W150267	14-Dec-11	
EPA 410.4	Chemical Oxygen Demand	mg/L	<5.0	2.1	5.0	W150121	12-Dec-11	
SM 2540 C	Total Diss. Solids	mg/L	<10		10	W149323	06-Dec-11	
SM 2540 D	Total Susp. Solids	mg/L	<5.0		5.0	W149321	06-Dec-11	
SM 4500-CN-I	Cyanide (WAD)	mg/L	<0.0100	0.0013	0.0100	W149303	02-Dec-11	
SM 4500-P-E	Phosphorus	mg/L	<0.010	0.004	0.010	W150226	09-Dec-11	
SM 5310B	Total Organic Carbon	mg/L	<1.00	0.18	1.00	W150162	07-Dec-11	

Anions by Ion Chromatography

EPA 300.0	Fluoride	mg/L	<0.10	0.02	0.10	W150230	08-Dec-11	
EPA 300.0	Chloride	mg/L	<0.20	0.07	0.20	W150230	08-Dec-11	
EPA 300.0	Sulfate as SO4	mg/L	<0.30	0.04	0.30	W150230	08-Dec-11	

Quality Control - LABORATORY CONTROL SAMPLE Data

Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	mg/L	0.00460	0.00500	92.0	85 - 115	W151086	14-Dec-11	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	mg/L	1.02	1.00	102	85 - 115	W149315	14-Dec-11	
EPA 200.7	Barium	mg/L	1.02	1.00	102	85 - 115	W149315	14-Dec-11	
EPA 200.7	Beryllium	mg/L	1.04	1.00	104	85 - 115	W149315	14-Dec-11	
EPA 200.7	Boron	mg/L	1.06	1.00	106	85 - 115	W149315	14-Dec-11	
EPA 200.7	Cadmium	mg/L	0.992	1.00	99.2	85 - 115	W149315	14-Dec-11	
EPA 200.7	Calcium	mg/L	19.2	20.0	96.0	85 - 115	W149315	14-Dec-11	
EPA 200.7	Chromium	mg/L	0.990	1.00	99.0	85 - 115	W149315	14-Dec-11	
EPA 200.7	Cobalt	mg/L	0.971	1.00	97.1	85 - 115	W149315	14-Dec-11	
EPA 200.7	Copper	mg/L	0.957	1.00	95.7	85 - 115	W149315	14-Dec-11	
EPA 200.7	Iron	mg/L	10.0	10.0	100	85 - 115	W149315	14-Dec-11	
EPA 200.7	Lead	mg/L	0.970	1.00	97.0	85 - 115	W149315	14-Dec-11	
EPA 200.7	Magnesium	mg/L	19.8	20.0	98.8	85 - 115	W149315	14-Dec-11	
EPA 200.7	Manganese	mg/L	1.03	1.00	103	85 - 115	W149315	14-Dec-11	
EPA 200.7	Molybdenum	mg/L	1.01	1.00	101	85 - 115	W149315	14-Dec-11	
EPA 200.7	Nickel	mg/L	0.919	1.00	91.9	85 - 115	W149315	14-Dec-11	
EPA 200.7	Potassium	mg/L	20.5	20.0	102	85 - 115	W149315	14-Dec-11	
EPA 200.7	Silicon	mg/L	5.39	5.00	108	85 - 115	W149315	14-Dec-11	
EPA 200.7	Silver	mg/L	0.0512	0.0500	102	85 - 115	W149315	14-Dec-11	
EPA 200.7	Sodium	mg/L	18.3	19.0	96.4	85 - 115	W149315	14-Dec-11	
EPA 200.7	Titanium	mg/L	1.02	1.00	102	85 - 115	W149315	14-Dec-11	
EPA 200.7	Vanadium	mg/L	1.01	1.00	101	85 - 115	W149315	14-Dec-11	
EPA 200.7	Zinc	mg/L	0.971	1.00	97.1	85 - 115	W149315	14-Dec-11	
EPA 200.8	Antimony	mg/L	0.0265	0.0250	106	85 - 115	W150013	08-Dec-11	
EPA 200.8	Arsenic	mg/L	0.0257	0.0250	103	85 - 115	W150013	08-Dec-11	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245
Work Order: **W1L0012**
Reported: 21-Dec-11 09:50

Quality Control - LABORATORY CONTROL SAMPLE Data (Continued)

Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Total Recoverable--reportable as Total per 40 CFR 136) (Continued)

EPA 200.8	Selenium	mg/L	0.0252	0.0250	101	85 - 115	W150013	08-Dec-11	
EPA 200.8	Uranium	mg/L	0.0284	0.0250	114	85 - 115	W150013	08-Dec-11	
EPA 200.8	Thallium	mg/L	0.0273	0.0250	109	85 - 115	W150013	08-Dec-11	

Metals (Dissolved)

EPA 200.7	Aluminum	mg/L	0.923	1.00	92.3	85 - 115	W149313	14-Dec-11	
EPA 200.7	Barium	mg/L	0.955	1.00	95.5	85 - 115	W149313	14-Dec-11	
EPA 200.7	Beryllium	mg/L	0.908	1.00	90.8	85 - 115	W149313	14-Dec-11	
EPA 200.7	Boron	mg/L	0.943	1.00	94.3	85 - 115	W149313	14-Dec-11	
EPA 200.7	Cadmium	mg/L	0.949	1.00	94.9	85 - 115	W149313	14-Dec-11	
EPA 200.7	Calcium	mg/L	18.4	20.0	92.1	85 - 115	W149313	14-Dec-11	
EPA 200.7	Chromium	mg/L	0.957	1.00	95.7	85 - 115	W149313	14-Dec-11	
EPA 200.7	Cobalt	mg/L	0.948	1.00	94.8	85 - 115	W149313	14-Dec-11	
EPA 200.7	Copper	mg/L	0.940	1.00	94.0	85 - 115	W149313	14-Dec-11	
EPA 200.7	Iron	mg/L	9.31	10.0	93.1	85 - 115	W149313	14-Dec-11	
EPA 200.7	Lead	mg/L	0.944	1.00	94.4	85 - 115	W149313	14-Dec-11	
EPA 200.7	Magnesium	mg/L	18.0	20.0	90.2	85 - 115	W149313	14-Dec-11	
EPA 200.7	Manganese	mg/L	0.926	1.00	92.6	85 - 115	W149313	14-Dec-11	
EPA 200.7	Molybdenum	mg/L	0.957	1.00	95.7	85 - 115	W149313	14-Dec-11	
EPA 200.7	Nickel	mg/L	0.910	1.00	91.0	85 - 115	W149313	14-Dec-11	
EPA 200.7	Potassium	mg/L	18.5	20.0	92.5	85 - 115	W149313	14-Dec-11	
EPA 200.7	Silicon	mg/L	4.89	5.00	97.8	85 - 115	W149313	14-Dec-11	
EPA 200.7	Silver	mg/L	0.0484	0.0500	96.9	85 - 115	W149313	14-Dec-11	
EPA 200.7	Sodium	mg/L	17.2	19.0	90.5	85 - 115	W149313	14-Dec-11	
EPA 200.7	Titanium	mg/L	0.940	1.00	94.0	85 - 115	W149313	14-Dec-11	
EPA 200.7	Vanadium	mg/L	0.952	1.00	95.2	85 - 115	W149313	14-Dec-11	
EPA 200.7	Zinc	mg/L	0.938	1.00	93.8	85 - 115	W149313	14-Dec-11	
EPA 200.8	Antimony	mg/L	0.0247	0.0250	98.6	85 - 115	W150023	08-Dec-11	
EPA 200.8	Arsenic	mg/L	0.0251	0.0250	100	85 - 115	W150023	08-Dec-11	
EPA 200.8	Selenium	mg/L	0.0252	0.0250	101	85 - 115	W150023	08-Dec-11	
EPA 200.8	Thallium	mg/L	0.0260	0.0250	104	85 - 115	W150023	08-Dec-11	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	mg/L	0.152	0.150	101	85 - 115	W149304	02-Dec-11	
EPA 120.1	Specific conductance	µmhos/cm	477	479	99.6	90 - 110	W149331	02-Dec-11	
EPA 180.1	Turbidity	NTU	4.42	4.39	101	90 - 110	W149342	02-Dec-11	
EPA 335.4	Cyanide (total)	mg/L	0.152	0.150	101	90 - 110	W149300	02-Dec-11	
EPA 350.1	Ammonia as N	mg/L	0.743	0.750	99.1	90 - 110	W149297	06-Dec-11	
EPA 353.2	Nitrate/Nitrite as N	mg/L	1.99	2.00	99.3	90 - 110	W150267	14-Dec-11	
EPA 410.4	Chemical Oxygen Demand	mg/L	110	113	97.0	90 - 110	W150121	12-Dec-11	
SM 4500-CN-I	Cyanide (WAD)	mg/L	0.157	0.150	105	90 - 110	W149303	02-Dec-11	
SM 4500-P-E	Phosphorus	mg/L	0.860	0.877	98.1	90 - 110	W150226	09-Dec-11	
SM 5310B	Total Organic Carbon	mg/L	67.6	66.7	101	80 - 120	W150162	07-Dec-11	

Anions by Ion Chromatography

EPA 300.0	Fluoride	mg/L	2.00	2.00	99.8	90 - 110	W150230	09-Dec-11	
EPA 300.0	Chloride	mg/L	3.01	3.00	100	90 - 110	W150230	09-Dec-11	
EPA 300.0	Sulfate as SO4	mg/L	10.3	10.0	103	90 - 110	W150230	09-Dec-11	



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: W1L0012

Reported: 21-Dec-11 09:50

Quality Control - DUPLICATE Data

Method	Analyte	Units	Duplicate Result	Sample Result	RPD	RPD Limit	Batch ID	Analyzed	Notes
Metals (Total)									
EPA 245.1	Mercury	mg/L	<0.00020	<0.00020	UDL	20	W151086	14-Dec-11	
Metals (Total Recoverable--reportable as Total per 40 CFR 136)									
EPA 200.7	Aluminum	mg/L	0.258	0.257	0.3	20	W149315	14-Dec-11	
EPA 200.7	Barium	mg/L	0.0060	0.0060	0.8	20	W149315	14-Dec-11	
EPA 200.7	Beryllium	mg/L	<0.0020	<0.0020	UDL	20	W149315	14-Dec-11	
EPA 200.7	Boron	mg/L	<0.040	<0.040	<RL	20	W149315	14-Dec-11	
EPA 200.7	Cadmium	mg/L	<0.0020	<0.0020	UDL	20	W149315	14-Dec-11	
EPA 200.7	Calcium	mg/L	1.11	1.11	0.0	20	W149315	14-Dec-11	
EPA 200.7	Chromium	mg/L	<0.0060	<0.0060	<RL	20	W149315	14-Dec-11	
EPA 200.7	Cobalt	mg/L	<0.0060	<0.0060	UDL	20	W149315	14-Dec-11	
EPA 200.7	Copper	mg/L	<0.010	<0.010	UDL	20	W149315	14-Dec-11	
EPA 200.7	Iron	mg/L	4.07	4.08	0.1	20	W149315	14-Dec-11	
EPA 200.7	Lead	mg/L	<0.0075	<0.0075	UDL	20	W149315	14-Dec-11	
EPA 200.7	Magnesium	mg/L	1.29	1.29	0.2	20	W149315	14-Dec-11	
EPA 200.7	Manganese	mg/L	0.0146	0.0147	0.7	20	W149315	14-Dec-11	
EPA 200.7	Molybdenum	mg/L	<0.008	<0.008	UDL	20	W149315	14-Dec-11	
EPA 200.7	Nickel	mg/L	<0.010	<0.010	UDL	20	W149315	14-Dec-11	
EPA 200.7	Potassium	mg/L	0.71	0.72	1.3	20	W149315	14-Dec-11	
EPA 200.7	Silicon	mg/L	4.36	4.34	0.5	20	W149315	14-Dec-11	
EPA 200.7	Silver	mg/L	<0.0050	<0.0050	UDL	20	W149315	14-Dec-11	
EPA 200.7	Sodium	mg/L	3.01	3.02	0.4	20	W149315	14-Dec-11	
EPA 200.7	Titanium	mg/L	<0.0050	<0.0050	<RL	20	W149315	14-Dec-11	
EPA 200.7	Vanadium	mg/L	<0.0050	<0.0050	<RL	20	W149315	14-Dec-11	
EPA 200.7	Zinc	mg/L	<0.0100	<0.0100	UDL	20	W149315	14-Dec-11	
EPA 200.8	Antimony	mg/L	<0.00300	<0.00300	UDL	20	W150013	08-Dec-11	
EPA 200.8	Arsenic	mg/L	<0.0030	<0.0030	<RL	20	W150013	08-Dec-11	
EPA 200.8	Selenium	mg/L	<0.00300	<0.00300	UDL	20	W150013	08-Dec-11	
EPA 200.8	Uranium	mg/L	<0.00100	<0.00100	<RL	20	W150013	08-Dec-11	
EPA 200.8	Thallium	mg/L	<0.00100	<0.00100	UDL	20	W150013	08-Dec-11	
Metals (Dissolved)									
EPA 200.7	Aluminum	mg/L	<0.080	<0.080	<RL	20	W149313	14-Dec-11	
EPA 200.7	Barium	mg/L	0.0042	0.0042	0.1	20	W149313	14-Dec-11	
EPA 200.7	Beryllium	mg/L	<0.0020	<0.0020	UDL	20	W149313	14-Dec-11	
EPA 200.7	Boron	mg/L	<0.040	<0.040	UDL	20	W149313	14-Dec-11	
EPA 200.7	Cadmium	mg/L	<0.0020	<0.0020	UDL	20	W149313	14-Dec-11	
EPA 200.7	Calcium	mg/L	1.11	1.12	0.9	20	W149313	14-Dec-11	
EPA 200.7	Chromium	mg/L	<0.0060	<0.0060	<RL	20	W149313	14-Dec-11	
EPA 200.7	Cobalt	mg/L	<0.0060	<0.0060	<RL	20	W149313	14-Dec-11	
EPA 200.7	Copper	mg/L	<0.010	<0.010	UDL	20	W149313	14-Dec-11	
EPA 200.7	Iron	mg/L	1.09	1.09	0.3	20	W149313	14-Dec-11	
EPA 200.7	Lead	mg/L	<0.0075	<0.0075	UDL	20	W149313	14-Dec-11	
EPA 200.7	Magnesium	mg/L	1.16	1.17	1.0	20	W149313	14-Dec-11	
EPA 200.7	Manganese	mg/L	0.0103	0.0104	1.7	20	W149313	14-Dec-11	
EPA 200.7	Molybdenum	mg/L	<0.008	<0.008	UDL	20	W149313	14-Dec-11	
EPA 200.7	Nickel	mg/L	<0.010	<0.010	UDL	20	W149313	14-Dec-11	
EPA 200.7	Potassium	mg/L	0.56	0.57	1.0	20	W149313	14-Dec-11	
EPA 200.7	Silicon	mg/L	3.97	3.98	0.3	20	W149313	14-Dec-11	
EPA 200.7	Silver	mg/L	<0.0050	<0.0050	UDL	20	W149313	14-Dec-11	
EPA 200.7	Sodium	mg/L	2.81	2.79	0.5	20	W149313	14-Dec-11	
EPA 200.7	Titanium	mg/L	<0.0050	<0.0050	<RL	20	W149313	14-Dec-11	
EPA 200.7	Vanadium	mg/L	<0.0050	<0.0050	UDL	20	W149313	14-Dec-11	
EPA 200.7	Zinc	mg/L	<0.0100	<0.0100	UDL	20	W149313	14-Dec-11	
EPA 200.8	Antimony	mg/L	<0.00300	<0.00300	<RL	20	W150023	08-Dec-11	
EPA 200.8	Arsenic	mg/L	<0.0030	<0.0030	UDL	20	W150023	08-Dec-11	
EPA 200.8	Selenium	mg/L	<0.00300	<0.00300	UDL	20	W150023	08-Dec-11	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268

Work order Report Page 34 of 38



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245
Work Order: **W1L0012**
Reported: 21-Dec-11 09:50

Quality Control - DUPLICATE Data (Continued)

Method	Analyte	Units	Duplicate Result	Sample Result	RPD	RPD Limit	Batch ID	Analyzed	Notes
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Metals (Dissolved) (Continued)

EPA 200.8	Thallium	mg/L	<0.00100	<0.00100	UDL	20	W150023	08-Dec-11	
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Classical Chemistry Parameters

EPA 120.1	Specific conductance	µmhos/cm	2110	2120	0.3	20	W149331	02-Dec-11	
EPA 120.1	Specific conductance	µmhos/cm	30.8	30.3	1.7	20	W149331	02-Dec-11	
EPA 180.1	Turbidity	NTU	5.41	5.63	4.0	20	W149342	02-Dec-11	
EPA 335.4	Cyanide (total)	mg/L	<0.0100	<0.0100	UDL	20	W149300	02-Dec-11	
EPA 350.1	Ammonia as N	mg/L	0.068	0.078	14.3	20	W149297	06-Dec-11	
EPA 353.2	Nitrate/Nitrite as N	mg/L	0.434	0.408	6.3	20	W150267	14-Dec-11	
EPA 410.4	Chemical Oxygen Demand	mg/L	16.7	16.1	3.6	20	W150121	12-Dec-11	
SM 2320B/2310B	Total Alkalinity	mg/L	7.2	7.2	0.6	20	W149336	02-Dec-11	
SM 2320B/2310B	Bicarbonate	mg/L	7.2	7.2	0.6	20	W149336	02-Dec-11	
SM 2320B/2310B	Carbonate	mg/L	<1.0	<1.0	UDL	20	W149336	02-Dec-11	
SM 2540 C	Total Diss. Solids	mg/L	23	32	32.7	10	W149323	06-Dec-11	R1
SM 2540 D	Total Susp. Solids	mg/L	21.0	27.0	25.0	10	W149321	06-Dec-11	R1
SM 2540 D	Total Susp. Solids	mg/L	429	436	1.6	10	W149321	06-Dec-11	
SM 4500 H B	pH	pH Units	6.24	6.33	1.4	20	W149336	02-Dec-11	
SM 4500-CN-I	Cyanide (WAD)	mg/L	<0.0100	<0.0100	<RL	20	W149303	02-Dec-11	
SM 4500-P-E	Phosphorus	mg/L	0.613	0.588	4.2	20	W150226	09-Dec-11	
SM 5310B	Total Organic Carbon	mg/L	4.96	4.87	1.7	20	W150162	07-Dec-11	

Anions by Ion Chromatography

EPA 300.0	Fluoride	mg/L	<0.10	<0.10	<RL	20	W150230	08-Dec-11	
EPA 300.0	Chloride	mg/L	3.87	3.91	1.0	20	W150230	08-Dec-11	
EPA 300.0	Sulfate as SO4	mg/L	0.64	0.58	9.8	20	W150230	08-Dec-11	

Quality Control - MATRIX SPIKE Data

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	mg/L	0.00106	<0.00020	0.00100	106	70 - 130	W151086	14-Dec-11	
EPA 245.1	Mercury	mg/L	0.00114	<0.00020	0.00100	114	70 - 130	W151086	14-Dec-11	

Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	mg/L	2.18	0.257	1.00	193	70 - 130	W149315	14-Dec-11	M1
EPA 200.7	Aluminum	mg/L	12.8	2.54	1.00	1030	70 - 130	W149315	14-Dec-11	M1
EPA 200.7	Barium	mg/L	1.04	0.0060	1.00	103	70 - 130	W149315	14-Dec-11	
EPA 200.7	Barium	mg/L	1.07	0.0162	1.00	105	70 - 130	W149315	14-Dec-11	
EPA 200.7	Beryllium	mg/L	1.03	<0.0020	1.00	103	70 - 130	W149315	14-Dec-11	
EPA 200.7	Beryllium	mg/L	1.02	<0.0020	1.00	102	70 - 130	W149315	14-Dec-11	
EPA 200.7	Boron	mg/L	1.06	<0.040	1.00	106	70 - 130	W149315	14-Dec-11	
EPA 200.7	Boron	mg/L	1.07	<0.040	1.00	106	70 - 130	W149315	14-Dec-11	
EPA 200.7	Cadmium	mg/L	0.976	<0.0020	1.00	97.6	70 - 130	W149315	14-Dec-11	
EPA 200.7	Cadmium	mg/L	0.981	<0.0020	1.00	98.1	70 - 130	W149315	14-Dec-11	
EPA 200.7	Calcium	mg/L	20.3	1.11	20.0	96.0	70 - 130	W149315	14-Dec-11	
EPA 200.7	Calcium	mg/L	20.9	1.59	20.0	96.5	70 - 130	W149315	14-Dec-11	
EPA 200.7	Chromium	mg/L	0.987	<0.0060	1.00	98.3	70 - 130	W149315	14-Dec-11	
EPA 200.7	Chromium	mg/L	1.01	0.0096	1.00	99.7	70 - 130	W149315	14-Dec-11	
EPA 200.7	Cobalt	mg/L	0.970	<0.0060	1.00	97.0	70 - 130	W149315	14-Dec-11	
EPA 200.7	Cobalt	mg/L	0.972	<0.0060	1.00	97.1	70 - 130	W149315	14-Dec-11	
EPA 200.7	Copper	mg/L	0.968	<0.010	1.00	96.8	70 - 130	W149315	14-Dec-11	
EPA 200.7	Copper	mg/L	0.983	<0.010	1.00	98.0	70 - 130	W149315	14-Dec-11	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



Golder Associates (WA)
 18300 NE Union Hill Road, Suite 200
 Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245
 Work Order: **W1L0012**
 Reported: 21-Dec-11 09:50

Quality Control - MATRIX SPIKE Data (Continued)

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Total Recoverable--reportable as Total per 40 CFR 136) (Continued)

EPA 200.7	Iron	mg/L	14.0	4.08	10.0	99.4	70 - 130	W149315	14-Dec-11	
EPA 200.7	Iron	mg/L	25.2	14.5	10.0	107	70 - 130	W149315	14-Dec-11	
EPA 200.7	Lead	mg/L	0.963	<0.0075	1.00	96.3	70 - 130	W149315	14-Dec-11	
EPA 200.7	Lead	mg/L	0.975	<0.0075	1.00	97.5	70 - 130	W149315	14-Dec-11	
EPA 200.7	Magnesium	mg/L	20.6	1.29	20.0	96.6	70 - 130	W149315	14-Dec-11	
EPA 200.7	Magnesium	mg/L	21.6	1.62	20.0	99.8	70 - 130	W149315	14-Dec-11	
EPA 200.7	Manganese	mg/L	1.03	0.0147	1.00	102	70 - 130	W149315	14-Dec-11	
EPA 200.7	Manganese	mg/L	1.33	0.317	1.00	102	70 - 130	W149315	14-Dec-11	
EPA 200.7	Molybdenum	mg/L	1.01	<0.008	1.00	101	70 - 130	W149315	14-Dec-11	
EPA 200.7	Molybdenum	mg/L	1.00	<0.008	1.00	100	70 - 130	W149315	14-Dec-11	
EPA 200.7	Nickel	mg/L	0.928	<0.010	1.00	92.8	70 - 130	W149315	14-Dec-11	
EPA 200.7	Nickel	mg/L	0.940	<0.010	1.00	93.7	70 - 130	W149315	14-Dec-11	
EPA 200.7	Potassium	mg/L	21.6	0.72	20.0	105	70 - 130	W149315	14-Dec-11	
EPA 200.7	Potassium	mg/L	22.7	1.30	20.0	107	70 - 130	W149315	14-Dec-11	
EPA 200.7	Silicon	mg/L	10.8	4.34	5.00	130	70 - 130	W149315	14-Dec-11	
EPA 200.7	Silicon	mg/L	21.7	6.01	5.00	314	70 - 130	W149315	14-Dec-11	MI
EPA 200.7	Silver	mg/L	0.0517	<0.0050	0.0500	103	70 - 130	W149315	14-Dec-11	
EPA 200.7	Silver	mg/L	0.0516	<0.0050	0.0500	103	70 - 130	W149315	14-Dec-11	
EPA 200.7	Sodium	mg/L	21.5	3.02	19.0	97.1	70 - 130	W149315	14-Dec-11	
EPA 200.7	Sodium	mg/L	23.8	5.59	19.0	95.8	70 - 130	W149315	14-Dec-11	
EPA 200.7	Titanium	mg/L	1.03	<0.0050	1.00	103	70 - 130	W149315	14-Dec-11	
EPA 200.7	Titanium	mg/L	1.04	0.0135	1.00	103	70 - 130	W149315	14-Dec-11	
EPA 200.7	Vanadium	mg/L	1.00	<0.0050	1.00	100	70 - 130	W149315	14-Dec-11	
EPA 200.7	Vanadium	mg/L	1.01	0.0061	1.00	101	70 - 130	W149315	14-Dec-11	
EPA 200.7	Zinc	mg/L	0.953	<0.0100	1.00	95.3	70 - 130	W149315	14-Dec-11	
EPA 200.7	Zinc	mg/L	0.968	<0.0100	1.00	96.4	70 - 130	W149315	14-Dec-11	
EPA 200.8	Antimony	mg/L	0.0247	<0.00300	0.0250	98.9	70 - 130	W150013	08-Dec-11	
EPA 200.8	Arsenic	mg/L	0.0240	<0.0030	0.0250	92.4	70 - 130	W150013	08-Dec-11	
EPA 200.8	Selenium	mg/L	0.0215	<0.00300	0.0250	85.9	70 - 130	W150013	08-Dec-11	
EPA 200.8	Uranium	mg/L	0.0269	<0.00100	0.0250	107	70 - 130	W150013	08-Dec-11	
EPA 200.8	Thallium	mg/L	0.0259	<0.00100	0.0250	104	70 - 130	W150013	08-Dec-11	

Metals (Dissolved)

EPA 200.7	Aluminum	mg/L	0.980	<0.080	1.00	96.3	70 - 130	W149313	14-Dec-11	
EPA 200.7	Aluminum	mg/L	0.975	<0.080	1.00	97.5	70 - 130	W149313	14-Dec-11	
EPA 200.7	Barium	mg/L	0.985	0.0042	1.00	98.1	70 - 130	W149313	14-Dec-11	
EPA 200.7	Barium	mg/L	0.999	0.0161	1.00	98.3	70 - 130	W149313	14-Dec-11	
EPA 200.7	Beryllium	mg/L	0.908	<0.0020	1.00	90.8	70 - 130	W149313	14-Dec-11	
EPA 200.7	Beryllium	mg/L	0.907	<0.0020	1.00	90.7	70 - 130	W149313	14-Dec-11	
EPA 200.7	Boron	mg/L	1.00	<0.040	1.00	100	70 - 130	W149313	14-Dec-11	
EPA 200.7	Boron	mg/L	1.01	<0.040	1.00	101	70 - 130	W149313	14-Dec-11	
EPA 200.7	Cadmium	mg/L	0.984	<0.0020	1.00	98.4	70 - 130	W149313	14-Dec-11	
EPA 200.7	Cadmium	mg/L	0.996	0.0060	1.00	99.0	70 - 130	W149313	14-Dec-11	
EPA 200.7	Calcium	mg/L	20.1	1.12	20.0	95.1	70 - 130	W149313	14-Dec-11	
EPA 200.7	Calcium	mg/L	62.6	44.2	20.0	91.7	70 - 130	W149313	14-Dec-11	
EPA 200.7	Chromium	mg/L	0.976	<0.0060	1.00	97.5	70 - 130	W149313	14-Dec-11	
EPA 200.7	Chromium	mg/L	0.979	<0.0060	1.00	97.9	70 - 130	W149313	14-Dec-11	
EPA 200.7	Cobalt	mg/L	0.978	<0.0060	1.00	97.7	70 - 130	W149313	14-Dec-11	
EPA 200.7	Cobalt	mg/L	0.993	0.0130	1.00	98.0	70 - 130	W149313	14-Dec-11	
EPA 200.7	Copper	mg/L	0.972	<0.010	1.00	97.2	70 - 130	W149313	14-Dec-11	
EPA 200.7	Copper	mg/L	1.10	0.096	1.00	100	70 - 130	W149313	14-Dec-11	
EPA 200.7	Iron	mg/L	10.7	1.09	10.0	96.0	70 - 130	W149313	14-Dec-11	
EPA 200.7	Iron	mg/L	9.62	<0.060	10.0	96.2	70 - 130	W149313	14-Dec-11	
EPA 200.7	Lead	mg/L	0.982	<0.0075	1.00	98.2	70 - 130	W149313	14-Dec-11	
EPA 200.7	Lead	mg/L	0.998	<0.0075	1.00	99.8	70 - 130	W149313	14-Dec-11	
EPA 200.7	Magnesium	mg/L	20.1	1.17	20.0	94.5	70 - 130	W149313	14-Dec-11	
EPA 200.7	Magnesium	mg/L	22.2	3.35	20.0	94.4	70 - 130	W149313	14-Dec-11	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245
Work Order: **W1L0012**
Reported: 21-Dec-11 09:50

Quality Control - MATRIX SPIKE Data (Continued)

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Dissolved) (Continued)

EPA 200.7	Manganese	mg/L	0.968	0.0104	1.00	95.8	70 - 130	W149313	14-Dec-11	
EPA 200.7	Manganese	mg/L	1.67	0.747	1.00	92.6	70 - 130	W149313	14-Dec-11	
EPA 200.7	Molybdenum	mg/L	0.983	<0.008	1.00	98.2	70 - 130	W149313	14-Dec-11	
EPA 200.7	Molybdenum	mg/L	0.996	<0.008	1.00	98.9	70 - 130	W149313	14-Dec-11	
EPA 200.7	Nickel	mg/L	0.953	<0.010	1.00	95.3	70 - 130	W149313	14-Dec-11	
EPA 200.7	Nickel	mg/L	1.00	0.031	1.00	97.3	70 - 130	W149313	14-Dec-11	
EPA 200.7	Potassium	mg/L	19.9	0.57	20.0	96.8	70 - 130	W149313	14-Dec-11	
EPA 200.7	Potassium	mg/L	26.0	6.45	20.0	97.9	70 - 130	W149313	14-Dec-11	
EPA 200.7	Silicon	mg/L	9.00	3.98	5.00	100	70 - 130	W149313	14-Dec-11	
EPA 200.7	Silicon	mg/L	10.4	5.54	5.00	96.8	70 - 130	W149313	14-Dec-11	
EPA 200.7	Silver	mg/L	0.0511	<0.0050	0.0500	102	70 - 130	W149313	14-Dec-11	
EPA 200.7	Silver	mg/L	0.0519	<0.0050	0.0500	104	70 - 130	W149313	14-Dec-11	
EPA 200.7	Sodium	mg/L	20.8	2.79	19.0	94.8	70 - 130	W149313	14-Dec-11	
EPA 200.7	Sodium	mg/L	18.6	<0.50	19.0	96.6	70 - 130	W149313	14-Dec-11	
EPA 200.7	Titanium	mg/L	0.973	<0.0050	1.00	97.2	70 - 130	W149313	14-Dec-11	
EPA 200.7	Titanium	mg/L	0.988	<0.0050	1.00	98.8	70 - 130	W149313	14-Dec-11	
EPA 200.7	Vanadium	mg/L	0.979	<0.0050	1.00	97.9	70 - 130	W149313	14-Dec-11	
EPA 200.7	Vanadium	mg/L	0.992	<0.0050	1.00	99.1	70 - 130	W149313	14-Dec-11	
EPA 200.7	Zinc	mg/L	0.967	<0.0100	1.00	96.7	70 - 130	W149313	14-Dec-11	
EPA 200.7	Zinc	mg/L	1.32	0.363	1.00	95.7	70 - 130	W149313	14-Dec-11	
EPA 200.8	Antimony	mg/L	0.0252	<0.00300	0.0250	99.9	70 - 130	W150023	08-Dec-11	
EPA 200.8	Arsenic	mg/L	0.0268	<0.0030	0.0250	107	70 - 130	W150023	08-Dec-11	
EPA 200.8	Selenium	mg/L	0.0279	<0.00300	0.0250	112	70 - 130	W150023	08-Dec-11	
EPA 200.8	Thallium	mg/L	0.0251	<0.00100	0.0250	101	70 - 130	W150023	08-Dec-11	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	mg/L	0.108	<0.005	0.100	108	85 - 115	W149304	02-Dec-11	
ASTM D7237	Cyanide (free)	mg/L	0.106	<0.005	0.100	106	85 - 115	W149304	02-Dec-11	
EPA 335.4	Cyanide (total)	mg/L	0.103	<0.0100	0.100	103	90 - 110	W149300	02-Dec-11	
EPA 335.4	Cyanide (total)	mg/L	0.106	<0.0100	0.100	103	90 - 110	W149300	02-Dec-11	
EPA 350.1	Ammonia as N	mg/L	0.519	0.078	0.500	88.1	90 - 110	W149297	06-Dec-11	M2
EPA 353.2	Nitrate/Nitrite as N	mg/L	1.68	0.408	1.00	128	90 - 110	W150267	14-Dec-11	M1
EPA 353.2	Nitrate/Nitrite as N	mg/L	1.52	0.335	1.00	118	90 - 110	W150267	14-Dec-11	M1
EPA 410.4	Chemical Oxygen Demand	mg/L	66.9	16.1	50.0	102	90 - 110	W150121	12-Dec-11	
SM 4500-CN-I	Cyanide (WAD)	mg/L	0.105	<0.0100	0.100	103	75 - 125	W149303	02-Dec-11	
SM 4500-CN-I	Cyanide (WAD)	mg/L	0.107	<0.0100	0.100	105	75 - 125	W149303	02-Dec-11	
SM 4500-P-E	Phosphorus	mg/L	0.904	0.588	0.500	63.2	75 - 125	W150226	09-Dec-11	M2
SM 5310B	Total Organic Carbon	mg/L	56.3	4.87	50.0	103	75 - 125	W150162	07-Dec-11	

Anions by Ion Chromatography

EPA 300.0	Fluoride	mg/L	2.03	<0.10	2.00	99.5	90 - 110	W150230	08-Dec-11	
EPA 300.0	Chloride	mg/L	6.90	3.91	3.00	99.9	90 - 110	W150230	08-Dec-11	
EPA 300.0	Sulfate as SO4	mg/L	11.2	0.58	10.0	106	90 - 110	W150230	08-Dec-11	

Quality Control - MATRIX SPIKE DUPLICATE Data

Method	Analyte	Units	MSD Result	Spike Result	Spike Level	RPD	RPD Limit	Batch ID	Analyzed	Notes
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Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	mg/L	0.114	0.108	0.100	5.6	20	W149304	02-Dec-11	
SM 4500-P-E	Phosphorus	mg/L	0.934	0.904	0.500	3.2	20	W150226	09-Dec-11	M2



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Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0012**

Reported: 21-Dec-11 09:50

Quality Control - POST DIGESTION SPIKE Data

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	mg/L	1.26	0.257	1.00	100	85 - 115	W149315	14-Dec-11	
EPA 200.7	Aluminum	mg/L	4.08	2.54	1.00	155	85 - 115	W149315	14-Dec-11	M1
EPA 200.7	Silicon	mg/L	11.8	6.01	5.00	115	85 - 115	W149315	14-Dec-11	

Notes and Definitions

- D2 Sample required dilution due to high concentration of target analyte.
- H3 Sample was received and analyzed past holding time.
- H5 This test is specified to be performed in the field within 15 minutes of sampling; sample was received and analyzed past the regulatory holding time.
- M1 Matrix spike recovery was high, but the LCS recovery was acceptable.
- M2 Matrix spike recovery was low, but the LCS recovery was acceptable.
- R1 RPD exceeded the method acceptance limit.
- LCS Laboratory Control Sample (Blank Spike)
- RPD Relative Percent Difference
- UDL A result is less than the detection limit
- R > 4S % recovery not applicable, sample concentration more than four times greater than spike level
- <RL A result is less than the reporting limit
- MRL Method Reporting Limit
- MDL Method Detection Limit
- N/A Not Applicable



Golder Associates (WA)
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Project Name: Suriname - Merian Gold 2011 / 113-93245.902

Work Order: **W1L0081**

Reported: 16-Dec-11 13:55

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Sampled By	Date Received
11242011SW019	W1L0081-01	Water	24-Nov-11 15:40	DH/JE	03-Dec-2011
11262011SW221	W1L0081-02	Water	26-Nov-11 11:00	DH/JE	03-Dec-2011
11242011SW119	W1L0081-03	Water	24-Nov-11 15:40	DH/JE	03-Dec-2011
11262011SW021	W1L0081-04	Water	26-Nov-11 10:45	DH/JE	03-Dec-2011
11252011SW120	W1L0081-05	Water	25-Nov-11 10:00	DH/JE	03-Dec-2011
11252011SW020	W1L0081-06	Water	25-Nov-11 09:56	DH/JE	03-Dec-2011
11222011SW015	W1L0081-07	Water	22-Nov-11 16:30	DH/JE	03-Dec-2011
11242011SW017	W1L0081-08	Water	24-Nov-11 11:35	DH/JE	03-Dec-2011
11242011SW018	W1L0081-09	Water	24-Nov-11 13:50	DH/JE	03-Dec-2011
11202011SW008	W1L0081-10	Water	20-Nov-11 14:40	DH/JE	03-Dec-2011
11182011SW004	W1L0081-11	Water	18-Nov-11 09:25	DH/JE	03-Dec-2011
11212011SW012	W1L0081-12	Water	21-Nov-11 15:00	DH/JE	03-Dec-2011
11212011SW013	W1L0081-13	Water	21-Nov-11 15:30	DH/JE	03-Dec-2011
11202011SW007	W1L0081-14	Water	20-Nov-11 13:15	DH/JE	03-Dec-2011
11212011SW011	W1L0081-15	Water	21-Nov-11 14:00	DH/JE	03-Dec-2011
11202011SW006	W1L0081-16	Water	20-Nov-11 11:15	DH/JE	03-Dec-2011

Solid samples are analyzed on an as-received, wet-weight basis, unless otherwise requested. Non-Detects are reported at the MDL.

Sample preparation is defined by the client as per their Data Quality Objectives.

This report supercedes any previous reports for this Work Order. The complete report includes pages for each sample, a full QC report, and a notes section.

The results presented in this report relate only to the samples, and meet all requirements of the NELAC Standards unless otherwise noted.

Case Narrative

The sample filters used by the client for Chlorophyll a and Pheophytin a were not the filters recommended in the method. SVL cannot provide assurance that these filters collected all of the analytes or that full extraction of the analytes were obtained. LJ 12-14-11



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Project Name: Suriname - Merian Gold 2011 / 113-93245.902

Work Order: **W1L0081**

Reported: 16-Dec-11 13:55

Client Sample ID: **11242011SW019**

SVL Sample ID: **W1L0081-01 (Water)**

Sampled: 24-Nov-11 15:40

Received: 03-Dec-11

Sampled By: DH/JE

Sample Report Page 1 of 1

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Classical Chemistry Parameters

SM 10200H	Chlorophyll-a	< 1.0	µg/L	1.0	0.3		W151103	PH	12/14/11 12:47	H9
SM 10200H	Pheophytin-a	< 1.0	µg/L	1.0			W151103	PH	12/14/11 12:47	H9

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

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Project Name: Suriname - Merian Gold 2011 / 113-93245.902

Work Order: **W1L0081**

Reported: 16-Dec-11 13:55

Client Sample ID: **11262011SW221**

SVL Sample ID: **W1L0081-02 (Water)**

Sample Report Page 1 of 1

Sampled: 26-Nov-11 11:00

Received: 03-Dec-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Classical Chemistry Parameters

SM 10200H	Chlorophyll-a	< 1.0	µg/L	1.0	0.3		W151103	PH	12/14/11 12:47	H9
SM 10200H	Pheophytin-a	< 1.0	µg/L	1.0			W151103	PH	12/14/11 12:47	H9

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Project Name: Suriname - Merian Gold 2011 / 113-93245.902

Work Order: **W1L0081**

Reported: 16-Dec-11 13:55

Client Sample ID: **11242011SW119**

SVL Sample ID: **W1L0081-03 (Water)**

Sampled: 24-Nov-11 15:40

Received: 03-Dec-11

Sampled By: DH/JE

Sample Report Page 1 of 1

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Classical Chemistry Parameters

SM 10200H	Chlorophyll-a	< 1.0	µg/L	1.0	0.3		W151103	PH	12/14/11 12:47	H9
SM 10200H	Pheophytin-a	< 1.0	µg/L	1.0			W151103	PH	12/14/11 12:47	H9

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Project Name: Suriname - Merian Gold 2011 / 113-93245.902

Work Order: **W1L0081**

Reported: 16-Dec-11 13:55

Client Sample ID: **11262011SW021**

SVL Sample ID: **W1L0081-04 (Water)**

Sample Report Page 1 of 1

Sampled: 26-Nov-11 10:45

Received: 03-Dec-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Classical Chemistry Parameters

SM 10200H	Chlorophyll-a	< 1.0	µg/L	1.0	0.3		W151103	PH	12/14/11 12:47	H9
SM 10200H	Pheophytin-a	< 1.0	µg/L	1.0			W151103	PH	12/14/11 12:47	H9

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Project Name: Suriname - Merian Gold 2011 / 113-93245.902

Work Order: **W1L0081**

Reported: 16-Dec-11 13:55

Client Sample ID: **11252011SW120**

SVL Sample ID: **W1L0081-05 (Water)**

Sample Report Page 1 of 1

Sampled: 25-Nov-11 10:00

Received: 03-Dec-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Classical Chemistry Parameters

SM 10200H	Chlorophyll-a	< 1.0	µg/L	1.0	0.3		W151103	PH	12/14/11 12:47	H9
SM 10200H	Pheophytin-a	< 1.0	µg/L	1.0			W151103	PH	12/14/11 12:47	H9

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Project Name: Suriname - Merian Gold 2011 / 113-93245.902

Work Order: **W1L0081**

Reported: 16-Dec-11 13:55

Client Sample ID: **11252011SW020**

SVL Sample ID: **W1L0081-06 (Water)**

Sample Report Page 1 of 1

Sampled: 25-Nov-11 09:56

Received: 03-Dec-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Classical Chemistry Parameters

SM 10200H	Chlorophyll-a	< 1.0	µg/L	1.0	0.3		W151103	PH	12/14/11 12:47	H9
SM 10200H	Pheophytin-a	< 1.0	µg/L	1.0			W151103	PH	12/14/11 12:47	H9

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Project Name: Suriname - Merian Gold 2011 / 113-93245.902

Work Order: **W1L0081**

Reported: 16-Dec-11 13:55

Client Sample ID: **11222011SW015**

SVL Sample ID: **W1L0081-07 (Water)**

Sample Report Page 1 of 1

Sampled: 22-Nov-11 16:30

Received: 03-Dec-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Classical Chemistry Parameters

SM 10200H	Chlorophyll-a	< 1.0	µg/L	1.0	0.3		W150287	PH	12/09/11 12:07	H9
SM 10200H	Pheophytin-a	< 1.0	µg/L	1.0			W150287	PH	12/09/11 12:07	H9

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Project Name: Suriname - Merian Gold 2011 / 113-93245.902

Work Order: **W1L0081**

Reported: 16-Dec-11 13:55

Client Sample ID: **11242011SW017**

SVL Sample ID: **W1L0081-08 (Water)**

Sample Report Page 1 of 1

Sampled: 24-Nov-11 11:35

Received: 03-Dec-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Classical Chemistry Parameters

SM 10200H	Chlorophyll-a	< 1.0	µg/L	1.0	0.3		W151103	PH	12/14/11 12:47	H9
SM 10200H	Pheophytin-a	< 1.0	µg/L	1.0			W151103	PH	12/14/11 12:47	H9

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Project Name: Suriname - Merian Gold 2011 / 113-93245.902

Work Order: **W1L0081**

Reported: 16-Dec-11 13:55

Client Sample ID: **11242011SW018**

SVL Sample ID: **W1L0081-09 (Water)**

Sample Report Page 1 of 1

Sampled: 24-Nov-11 13:50

Received: 03-Dec-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Classical Chemistry Parameters

SM 10200H	Chlorophyll-a	< 1.0	µg/L	1.0	0.3		W151103	PH	12/14/11 12:47	H9
SM 10200H	Pheophytin-a	< 1.0	µg/L	1.0			W151103	PH	12/14/11 12:47	H9

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Project Name: Suriname - Merian Gold 2011 / 113-93245.902

Work Order: **W1L0081**

Reported: 16-Dec-11 13:55

Client Sample ID: **11202011SW008**

SVL Sample ID: **W1L0081-10 (Water)**

Sample Report Page 1 of 1

Sampled: 20-Nov-11 14:40

Received: 03-Dec-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Classical Chemistry Parameters

SM 10200H	Chlorophyll-a	< 1.0	µg/L	1.0	0.3		W150287	PH	12/09/11 12:07	H9
SM 10200H	Pheophytin-a	< 1.0	µg/L	1.0			W150287	PH	12/09/11 12:07	H9

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Project Name: Suriname - Merian Gold 2011 / 113-93245.902

Work Order: **W1L0081**

Reported: 16-Dec-11 13:55

Client Sample ID: **11182011SW004**

SVL Sample ID: **W1L0081-11 (Water)**

Sample Report Page 1 of 1

Sampled: 18-Nov-11 09:25

Received: 03-Dec-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Classical Chemistry Parameters

SM 10200H	Chlorophyll-a	< 1.0	µg/L	1.0	0.3		W150223	PH	12/08/11 13:04	H9
SM 10200H	Pheophytin-a	8.4	µg/L	1.0			W150223	PH	12/08/11 13:04	H9

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

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Project Name: Suriname - Merian Gold 2011 / 113-93245.902

Work Order: **W1L0081**

Reported: 16-Dec-11 13:55

Client Sample ID: **11212011SW012**

SVL Sample ID: **W1L0081-12 (Water)**

Sample Report Page 1 of 1

Sampled: 21-Nov-11 15:00

Received: 03-Dec-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Classical Chemistry Parameters

SM 10200H	Chlorophyll-a	< 1.0	µg/L	1.0	0.3		W150287	PH	12/09/11 12:07	H9
SM 10200H	Pheophytin-a	< 1.0	µg/L	1.0			W150287	PH	12/09/11 12:07	H9

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

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Project Name: Suriname - Merian Gold 2011 / 113-93245.902

Work Order: **W1L0081**

Reported: 16-Dec-11 13:55

Client Sample ID: **11212011SW013**

SVL Sample ID: **W1L0081-13 (Water)**

Sample Report Page 1 of 1

Sampled: 21-Nov-11 15:30

Received: 03-Dec-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Classical Chemistry Parameters

SM 10200H	Chlorophyll-a	4.4	µg/L	1.0	0.3		W150287	PH	12/09/11 12:07	H9
SM 10200H	Pheophytin-a	< 1.0	µg/L	1.0			W150287	PH	12/09/11 12:07	H9

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Project Name: Suriname - Merian Gold 2011 / 113-93245.902

Work Order: **W1L0081**

Reported: 16-Dec-11 13:55

Client Sample ID: **11202011SW007**

SVL Sample ID: **W1L0081-14 (Water)**

Sample Report Page 1 of 1

Sampled: 20-Nov-11 13:15

Received: 03-Dec-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Classical Chemistry Parameters

SM 10200H	Chlorophyll-a	< 1.0	µg/L	1.0	0.3		W150287	PH	12/09/11 12:07	H9
SM 10200H	Pheophytin-a	< 1.0	µg/L	1.0			W150287	PH	12/09/11 12:07	H9

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Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245.902

Work Order: **W1L0081**

Reported: 16-Dec-11 13:55

Client Sample ID: **11212011SW011**

SVL Sample ID: **W1L0081-15 (Water)**

Sample Report Page 1 of 1

Sampled: 21-Nov-11 14:00

Received: 03-Dec-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Classical Chemistry Parameters

SM 10200H	Chlorophyll-a	< 1.0	µg/L	1.0	0.3		W150287	PH	12/09/11 12:07	H9
SM 10200H	Pheophytin-a	< 1.0	µg/L	1.0			W150287	PH	12/09/11 12:07	H9

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

(208) 784-1258

Fax (208) 783-0891

Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245.902

Work Order: **W1L0081**

Reported: 16-Dec-11 13:55

Client Sample ID: **11202011SW006**

SVL Sample ID: **W1L0081-16 (Water)**

Sample Report Page 1 of 1

Sampled: 20-Nov-11 11:15

Received: 03-Dec-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Classical Chemistry Parameters

SM 10200H	Chlorophyll-a	1.9	µg/L	1.0	0.3		W150287	PH	12/09/11 12:07	H9
SM 10200H	Pheophytin-a	1.5	µg/L	1.0			W150287	PH	12/09/11 12:07	H9

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Golder Associates (WA)
 18300 NE Union Hill Road, Suite 200
 Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245.902
 Work Order: **W1L0081**
 Reported: 16-Dec-11 13:55

Quality Control - BLANK Data

Method	Analyte	Units	Result	MDL	MRL	Batch ID	Analyzed	Notes
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Classical Chemistry Parameters

SM 10200H	Chlorophyll-a	µg/L	<1.0	0.3	1.0	W150223	08-Dec-11	
SM 10200H	Chlorophyll-a	µg/L	<1.0	0.3	1.0	W150287	09-Dec-11	
SM 10200H	Chlorophyll-a	µg/L	<1.0	0.3	1.0	W151103	14-Dec-11	

Quality Control - LABORATORY CONTROL SAMPLE Data

Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Classical Chemistry Parameters

SM 10200H	Chlorophyll-a	µg/L	11.2	12.5	89.6	75 - 125	W150223	08-Dec-11	
SM 10200H	Chlorophyll-a	µg/L	24.0	25.0	96.0	75 - 125	W150223	08-Dec-11	
SM 10200H	Chlorophyll-a	µg/L	7.5	6.25	120	75 - 125	W150223	08-Dec-11	
SM 10200H	Chlorophyll-a	µg/L	11.7	12.5	93.6	75 - 125	W150287	09-Dec-11	
SM 10200H	Chlorophyll-a	µg/L	22.4	25.0	89.6	75 - 125	W150287	09-Dec-11	
SM 10200H	Chlorophyll-a	µg/L	5.9	6.25	94.4	75 - 125	W150287	09-Dec-11	
SM 10200H	Chlorophyll-a	µg/L	10.1	12.5	80.8	75 - 125	W151103	14-Dec-11	
SM 10200H	Chlorophyll-a	µg/L	27.8	25.0	111	75 - 125	W151103	14-Dec-11	
SM 10200H	Chlorophyll-a	µg/L	6.4	6.25	102	75 - 125	W151103	14-Dec-11	

Notes and Definitions

H9	Sample was filtered and frozen in the field.
LCS	Laboratory Control Sample (Blank Spike)
RPD	Relative Percent Difference
UDL	A result is less than the detection limit
R > 4S	% recovery not applicable, sample concentration more than four times greater than spike level
<RL	A result is less than the reporting limit
MRL	Method Reporting Limit
MDL	Method Detection Limit
N/A	Not Applicable

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Client: GOLDER ASSOCIATES **Batch #:** 120313031
Address: 18300 NE UNION HILL ROAD SUITE 200 **Project Name:** SVL #W2C0204
REDMOND, WA 98052
Attn: MICHAEL KLISCH

Analytical Results Report

Sample Number	120313031-001	Sampling Date	3/4/2012	Date/Time Received	3/13/2012 3:30 PM
Client Sample ID	04MAR2012SW007	Sampling Time	10:30 AM	Extraction Date	3/16/2012
Matrix	Water	Sample Location	W2C0204-01		
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Hexane extractable material (HEM)	ND	mg/L	1	3/19/2012	KFG	EPA 1664A	

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Client: GOLDER ASSOCIATES **Batch #:** 120313031
Address: 18300 NE UNION HILL ROAD SUITE 200 **Project Name:** SVL #W2C0204
REDMOND, WA 98052
Attn: MICHAEL KLISCH

Analytical Results Report

Sample Number	120313031-002	Sampling Date	3/4/2012	Date/Time Received	3/13/2012 3:30 PM		
Client Sample ID	04MAR2012SW008	Sampling Time	12:50 PM	Extraction Date	3/22/2012		
Matrix	Water	Sample Location	W2C0204-02				
Comments							
Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Hexane extractable material (HEM)	ND	mg/L	1	3/23/2012	KFG	EPA 1664A	

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Client: GOLDER ASSOCIATES **Batch #:** 120313031
Address: 18300 NE UNION HILL ROAD SUITE 200 **Project Name:** SVL #W2C0204
REDMOND, WA 98052
Attn: MICHAEL KLISCH

Analytical Results Report

Sample Number	120313031-003	Sampling Date	3/4/2012	Date/Time Received	3/13/2012 3:30 PM
Client Sample ID	04MAR2012SW009	Sampling Time	2:15 PM	Extraction Date	3/22/2012
Matrix	Water	Sample Location	W2C0204-03		
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Hexane extractable material (HEM)	ND	mg/L	1	3/23/2012	KFG	EPA 1664A	

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Client: GOLDER ASSOCIATES **Batch #:** 120313031
Address: 18300 NE UNION HILL ROAD SUITE 200 **Project Name:** SVL #W2C0204
REDMOND, WA 98052
Attn: MICHAEL KLISCH

Analytical Results Report

Sample Number	120313031-004	Sampling Date	3/4/2012	Date/Time Received	3/13/2012 3:30 PM
Client Sample ID	04MAR2012SW010	Sampling Time	3:20 PM	Extraction Date	3/22/2012
Matrix	Water	Sample Location	W2C0204-04		
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Hexane extractable material (HEM)	ND	mg/L	1	3/23/2012	KFG	EPA 1664A	

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Client: GOLDER ASSOCIATES **Batch #:** 120313031
Address: 18300 NE UNION HILL ROAD SUITE 200 **Project Name:** SVL #W2C0204
REDMOND, WA 98052
Attn: MICHAEL KLISCH

Analytical Results Report

Sample Number	120313031-005	Sampling Date	3/4/2012	Date/Time Received	3/13/2012 3:30 PM		
Client Sample ID	04MAR2012SW011	Sampling Time	4:00 PM	Extraction Date	3/22/2012		
Matrix	Water	Sample Location	W2C0204-05				
Comments							
Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Hexane extractable material (HEM)	ND	mg/L	1	3/23/2012	KFG	EPA 1664A	

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Client: GOLDER ASSOCIATES **Batch #:** 120313031
Address: 18300 NE UNION HILL ROAD SUITE 200 **Project Name:** SVL #W2C0204
REDMOND, WA 98052
Attn: MICHAEL KLISCH

Analytical Results Report

Sample Number	120313031-006	Sampling Date	3/5/2012	Date/Time Received	3/13/2012 3:30 PM
Client Sample ID	05MAR2012SW012	Sampling Time	9:32 AM	Extraction Date	3/22/2012
Matrix	Water	Sample Location	W2C0204-06		
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Hexane extractable material (HEM)	ND	mg/L	1	3/23/2012	KFG	EPA 1664A	

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Client: GOLDER ASSOCIATES **Batch #:** 120313031
Address: 18300 NE UNION HILL ROAD SUITE 200 **Project Name:** SVL #W2C0204
REDMOND, WA 98052
Attn: MICHAEL KLISCH

Analytical Results Report

Sample Number	120313031-007	Sampling Date	3/5/2012	Date/Time Received	3/13/2012 3:30 PM		
Client Sample ID	05MAR2012SW013	Sampling Time	11:42 AM	Extraction Date	3/22/2012		
Matrix	Water	Sample Location	W2C0204-07				
Comments							
Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Hexane extractable material (HEM)	3.3	mg/L	1	3/23/2012	KFG	EPA 1664A	

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Client: GOLDER ASSOCIATES **Batch #:** 120313031
Address: 18300 NE UNION HILL ROAD SUITE 200 **Project Name:** SVL #W2C0204
REDMOND, WA 98052
Attn: MICHAEL KLISCH

Analytical Results Report

Sample Number	120313031-008	Sampling Date	3/5/2012	Date/Time Received	3/13/2012 3:30 PM
Client Sample ID	05MAR2012SW113	Sampling Time	11:45 AM	Extraction Date	3/22/2012
Matrix	Water	Sample Location	W2C0204-08		
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Hexane extractable material (HEM)	ND	mg/L	1	3/23/2012	KFG	EPA 1664A	

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Client: GOLDER ASSOCIATES **Batch #:** 120313031
Address: 18300 NE UNION HILL ROAD SUITE 200 **Project Name:** SVL #W2C0204
REDMOND, WA 98052
Attn: MICHAEL KLISCH

Analytical Results Report

Sample Number	120313031-009	Sampling Date	3/5/2012	Date/Time Received	3/13/2012 3:30 PM
Client Sample ID	05MAR2012SW014	Sampling Time	2:09 PM	Extraction Date	3/22/2012
Matrix	Water	Sample Location	W2C0204-09		
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Hexane extractable material (HEM)	ND	mg/L	1	3/23/2012	KFG	EPA 1664A	

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Client: GOLDER ASSOCIATES

Batch #: 120313031

Address: 18300 NE UNION HILL ROAD SUITE 200
REDMOND, WA 98052

Project Name: SVL #W2C0204

Attn: MICHAEL KLISCH

Analytical Results Report

Sample Number	120313031-010	Sampling Date	3/5/2012	Date/Time Received	3/13/2012 3:30 PM
Client Sample ID	05MAR2012SW201	Sampling Time	4:00 PM	Extraction Date	3/22/2012
Matrix	Water	Sample Location	W2C0204-10		
Comments					

<u>Parameter</u>	<u>Result</u>	<u>Units</u>	<u>PQL</u>	<u>Analysis Date</u>	<u>Analyst</u>	<u>Method</u>	<u>Qualifier</u>
Hexane extractable material (HEM)	ND	mg/L	1	3/23/2012	KFG	EPA 1664A	

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Client: GOLDER ASSOCIATES **Batch #:** 120313031
Address: 18300 NE UNION HILL ROAD SUITE 200 **Project Name:** SVL #W2C0204
REDMOND, WA 98052
Attn: MICHAEL KLISCH

Analytical Results Report

Sample Number	120313031-011	Sampling Date	3/5/2012	Date/Time Received	3/13/2012 3:30 PM		
Client Sample ID	05MAR2012SW015	Sampling Time	4:50 PM	Extraction Date	3/22/2012		
Matrix	Water	Sample Location	W2C0204-11				
Comments							
Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Hexane extractable material (HEM)	ND	mg/L	1	3/23/2012	KFG	EPA 1664A	

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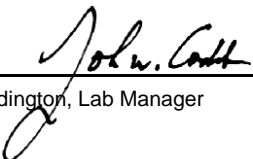
Client: GOLDER ASSOCIATES **Batch #:** 120313031
Address: 18300 NE UNION HILL ROAD SUITE 200 **Project Name:** SVL #W2C0204
REDMOND, WA 98052
Attn: MICHAEL KLISCH

Analytical Results Report

Sample Number	120313031-012	Sampling Date	3/3/2012	Date/Time Received	3/13/2012 3:30 PM
Client Sample ID	03MAR2012SW005	Sampling Time	10:15 AM	Extraction Date	3/22/2012
Matrix	Water	Sample Location	W2C0204-12		
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Hexane extractable material (HEM)	ND	mg/L	1	3/23/2012	KFG	EPA 1664A	

Authorized Signature



John Coddington, Lab Manager

MCL EPA's Maximum Contaminant Level
ND Not Detected
PQL Practical Quantitation Limit

This report shall not be reproduced except in full, without the written approval of the laboratory.
The results reported relate only to the samples indicated.
Soil/solid results are reported on a dry-weight basis unless otherwise noted.

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Client: GOLDER ASSOCIATES **Batch #:** 120313031
Address: 18300 NE UNION HILL ROAD SUITE 200 **Project Name:** SVL #W2C0204
REDMOND, WA 98052
Attn: MICHAEL KLISCH

Analytical Results Report Quality Control Data

Lab Control Sample

Parameter	LCS Result	Units	LCS Spike	%Rec	AR %Rec	Prep Date	Analysis Date
Hexane extractable material (HEM)	39.5	mg/L	40	98.8	79-114	3/22/2012	3/23/2012
Hexane extractable material (HEM)	37.9	mg/L	40	94.8	79-114	3/16/2012	3/19/2012

Matrix Spike

Sample Number	Parameter	Sample Result	MS Result	Units	MS Spike	%Rec	AR %Rec	Prep Date	Analysis Date
120320014-001	Hexane extractable material (HEM)	ND	35.8	mg/L	40	89.5	79-114	3/22/2012	3/23/2012
120309010-001	Hexane extractable material (HEM)	ND	36.9	mg/L	40	92.3	79-114	3/16/2012	3/19/2012

Matrix Spike Duplicate

Parameter	MSD Result	Units	MSD Spike	%Rec	%RPD	AR %RPD	Prep Date	Analysis Date
Hexane extractable material (HEM)	38.7	mg/L	40	96.8	7.8	0-18	3/22/2012	3/23/2012
Hexane extractable material (HEM)	31.2	mg/L	40	78.0	16.7	0-18	3/16/2012	3/19/2012

Method Blank

Parameter	Result	Units	PQL	Prep Date	Analysis Date
Hexane extractable material (HEM)	ND	mg/L	1	3/22/2012	3/23/2012
Hexane extractable material (HEM)	ND	mg/L	1	3/16/2012	3/19/2012

AR Acceptable Range
ND Not Detected
PQL Practical Quantitation Limit
RPD Relative Percentage Difference

Comments:

Certifications held by Anatek Labs ID: EPA:ID00013; AZ:0701; CO:ID00013; FL(NELAP):E87893; ID:ID00013; IN:C-ID-01; KY:90142; MT:CERT0028; NM: ID00013; OR:ID200001-002; WA:C595
Certifications held by Anatek Labs WA: EPA:WA00169; CA:Cert2632; ID:WA00169; WA:C585; MT:Cert0095

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Login Report

Customer Name: GOLDER ASSOCIATES

Order ID: 120313031

18300 NE UNION HILL ROAD SUITE 200
REDMOND WA 98052

Order Date: 3/13/2012

Contact Name: MICHAEL KLISCH

Project Name: SVL #W2C0204

Comment:

Sample #: 120313031-001 **Customer Sample #:** 04MAR2012SW007

Recv'd: **Collector:** **Date Collected:** 3/4/2012
Quantity: 1 **Matrix:** Water **Date Received:** 3/13/2012 3:30:00 P
Comment:

Test	Lab	Method	Due Date	Priority
FOG - HEM	M	EPA 1664A	3/23/2012	<u>Normal (6-10 Days)</u>

Sample #: 120313031-002 **Customer Sample #:** 04MAR2012SW008

Recv'd: **Collector:** **Date Collected:** 3/4/2012
Quantity: 1 **Matrix:** Water **Date Received:** 3/13/2012 3:30:00 P
Comment:

Test	Lab	Method	Due Date	Priority
FOG - HEM	M	EPA 1664A	3/23/2012	<u>Normal (6-10 Days)</u>

Sample #: 120313031-003 **Customer Sample #:** 04MAR2012SW009

Recv'd: **Collector:** **Date Collected:** 3/4/2012
Quantity: 1 **Matrix:** Water **Date Received:** 3/13/2012 3:30:00 P
Comment:

Test	Lab	Method	Due Date	Priority
FOG - HEM	M	EPA 1664A	3/23/2012	<u>Normal (6-10 Days)</u>

Customer Name: GOLDER ASSOCIATES
18300 NE UNION HILL ROAD SUITE 200
REDMOND WA 98052

Order ID: 120313031
Order Date: 3/13/2012

Contact Name: MICHAEL KLISCH

Project Name: SVL #W2C0204

Comment:

Sample #: 120313031-004 **Customer Sample #:** 04MAR2012SW010

Recv'd: **Collector:** **Date Collected:** 3/4/2012
Quantity: 1 **Matrix:** Water **Date Received:** 3/13/2012 3:30:00 P
Comment:

Test	Lab	Method	Due Date	Priority
FOG - HEM	M	EPA 1664A	3/23/2012	<u>Normal (6-10 Days)</u>

Sample #: 120313031-005 **Customer Sample #:** 04MAR2012SW011

Recv'd: **Collector:** **Date Collected:** 3/4/2012
Quantity: 1 **Matrix:** Water **Date Received:** 3/13/2012 3:30:00 P
Comment:

Test	Lab	Method	Due Date	Priority
FOG - HEM	M	EPA 1664A	3/23/2012	<u>Normal (6-10 Days)</u>

Sample #: 120313031-006 **Customer Sample #:** 05MAR2012SW012

Recv'd: **Collector:** **Date Collected:** 3/5/2012
Quantity: 1 **Matrix:** Water **Date Received:** 3/13/2012 3:30:00 P
Comment:

Test	Lab	Method	Due Date	Priority
FOG - HEM	M	EPA 1664A	3/23/2012	<u>Normal (6-10 Days)</u>

Sample #: 120313031-007 **Customer Sample #:** 05MAR2012SW013

Recv'd: **Collector:** **Date Collected:** 3/5/2012
Quantity: 1 **Matrix:** Water **Date Received:** 3/13/2012 3:30:00 P
Comment:

Test	Lab	Method	Due Date	Priority
FOG - HEM	M	EPA 1664A	3/23/2012	<u>Normal (6-10 Days)</u>

Customer Name: GOLDER ASSOCIATES
18300 NE UNION HILL ROAD SUITE 200
REDMOND WA 98052

Order ID: 120313031
Order Date: 3/13/2012

Contact Name: MICHAEL KLISCH

Project Name: SVL #W2C0204

Comment:

Sample #: 120313031-008 **Customer Sample #:** 05MAR2012SW113

Recv'd: **Collector:** **Date Collected:** 3/5/2012
Quantity: 1 **Matrix:** Water **Date Received:** 3/13/2012 3:30:00 P
Comment:

Test	Lab	Method	Due Date	Priority
FOG - HEM	M	EPA 1664A	3/23/2012	<u>Normal (6-10 Days)</u>

Sample #: 120313031-009 **Customer Sample #:** 05MAR2012SW014

Recv'd: **Collector:** **Date Collected:** 3/5/2012
Quantity: 1 **Matrix:** Water **Date Received:** 3/13/2012 3:30:00 P
Comment:

Test	Lab	Method	Due Date	Priority
FOG - HEM	M	EPA 1664A	3/23/2012	<u>Normal (6-10 Days)</u>

Sample #: 120313031-010 **Customer Sample #:** 05MAR2012SW201

Recv'd: **Collector:** **Date Collected:** 3/5/2012
Quantity: 1 **Matrix:** Water **Date Received:** 3/13/2012 3:30:00 P
Comment:

Test	Lab	Method	Due Date	Priority
FOG - HEM	M	EPA 1664A	3/23/2012	<u>Normal (6-10 Days)</u>

Sample #: 120313031-011 **Customer Sample #:** 05MAR2012SW015

Recv'd: **Collector:** **Date Collected:** 3/5/2012
Quantity: 1 **Matrix:** Water **Date Received:** 3/13/2012 3:30:00 P
Comment:

Test	Lab	Method	Due Date	Priority
FOG - HEM	M	EPA 1664A	3/23/2012	<u>Normal (6-10 Days)</u>

Customer Name: GOLDER ASSOCIATES
18300 NE UNION HILL ROAD SUITE 200
REDMOND WA 98052

Order ID: 120313031
Order Date: 3/13/2012

Contact Name: MICHAEL KLISCH

Project Name: SVL #W2C0204

Comment:

Sample #: 120313031-012 **Customer Sample #:** 03MAR2012SW005

Recv'd: **Collector:** **Date Collected:** 3/3/2012
Quantity: 1 **Matrix:** Water **Date Received:** 3/13/2012 3:30:00 P

Comment:

Test	Lab	Method	Due Date	Priority
FOG - HEM	M	EPA 1664A	3/23/2012	<u>Normal (6-10 Days)</u>

SAMPLE CONDITION RECORD

Samples received in a cooler?	Yes
Samples received intact?	Yes
What is the temperature inside the cooler?	4.9
Samples received with a COC?	Yes
Samples received within holding time?	Yes
Are all sample bottles properly preserved?	Yes
Are VOC samples free of headspace?	N/A
Is there a trip blank to accompany VOC samples?	N/A
Labels and chain agree?	Yes



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: **Suriname Merian 2012 / 113-93245**

Work Order: **W2C0204**

Reported: 28-Mar-12 11:59

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Sampled By	Date Received
04MAR2012SW007	W2C0204-01	Surface Water	04-Mar-12 10:30	FH	12-Mar-2012
04MAR2012SW008	W2C0204-02	Surface Water	04-Mar-12 12:50	FH	12-Mar-2012
04MAR2012SW009	W2C0204-03	Surface Water	04-Mar-12 14:15	FH	12-Mar-2012
04MAR2012SW010	W2C0204-04	Surface Water	04-Mar-12 15:20	FH	12-Mar-2012
04MAR2012SW011	W2C0204-05	Surface Water	04-Mar-12 16:00	FH	12-Mar-2012
05MAR2012SW012	W2C0204-06	Surface Water	05-Mar-12 09:32	FH	12-Mar-2012
05MAR2012SW013	W2C0204-07	Surface Water	05-Mar-12 11:42	FH	12-Mar-2012
05MAR2012SW113	W2C0204-08	Surface Water	05-Mar-12 11:45	FH	12-Mar-2012
05MAR2012SW014	W2C0204-09	Surface Water	05-Mar-12 14:09	FH	12-Mar-2012
05MAR2012SW201	W2C0204-10	Surface Water	05-Mar-12 16:00	FH	12-Mar-2012
05MAR2012SW015	W2C0204-11	Surface Water	05-Mar-12 16:50	FH	12-Mar-2012
03MAR2012SW005	W2C0204-12	Surface Water	03-Mar-12 10:15	FH	12-Mar-2012

Solid samples are analyzed on an as-received, wet-weight basis, unless otherwise requested. Non-Detects are reported at the MDL.

Sample preparation is defined by the client as per their Data Quality Objectives.

This report supercedes any previous reports for this Work Order. The complete report includes pages for each sample, a full QC report, and a notes section.

The results presented in this report relate only to the samples, and meet all requirements of the NELAC Standards unless otherwise noted.

(Q6) SVL received the following containers outside of published EPA guidelines for preservation temperatures (0-6°C).

The guidelines do not pertain to nitric-preserved metals.

Default Cooler (Received Temperature: 13.6°C)

Labnumber	Container	Client ID	Labnumber	Container	Client ID
W2C0204-01 A	Raw HDPE	04MAR2012SW007	W2C0204-01 B	Sulfuric HDPE	04MAR2012SW007
W2C0204-01 C	Filtered nitric HDPE	04MAR2012SW007	W2C0204-01 D	Nitric HDPE	04MAR2012SW007
W2C0204-01 E	NaOH HDPE	04MAR2012SW007	W2C0204-01 F	VOA glass 40mL	04MAR2012SW007
W2C0204-01 G	VOA glass 40mL	04MAR2012SW007	W2C0204-01 H	Sulfuric Amber Glass	04MAR2012SW007
W2C0204-02 A	Raw HDPE	04MAR2012SW008	W2C0204-02 B	Sulfuric HDPE	04MAR2012SW008
W2C0204-02 C	Filtered nitric HDPE	04MAR2012SW008	W2C0204-02 D	Nitric HDPE	04MAR2012SW008
W2C0204-02 E	NaOH HDPE	04MAR2012SW008	W2C0204-02 F	VOA glass 40mL	04MAR2012SW008
W2C0204-02 G	VOA glass 40mL	04MAR2012SW008	W2C0204-02 H	Sulfuric Amber Glass	04MAR2012SW008
W2C0204-03 A	Raw HDPE	04MAR2012SW009	W2C0204-03 B	Sulfuric HDPE	04MAR2012SW009
W2C0204-03 C	Filtered nitric HDPE	04MAR2012SW009	W2C0204-03 D	Nitric HDPE	04MAR2012SW009
W2C0204-03 E	NaOH HDPE	04MAR2012SW009	W2C0204-03 F	VOA glass 40mL	04MAR2012SW009
W2C0204-03 G	VOA glass 40mL	04MAR2012SW009	W2C0204-03 H	Sulfuric Amber Glass	04MAR2012SW009
W2C0204-04 A	Raw HDPE	04MAR2012SW010	W2C0204-04 B	Sulfuric HDPE	04MAR2012SW010
W2C0204-04 C	Filtered nitric HDPE	04MAR2012SW010	W2C0204-04 D	Nitric HDPE	04MAR2012SW010
W2C0204-04 E	NaOH HDPE	04MAR2012SW010	W2C0204-04 F	VOA glass 40mL	04MAR2012SW010
W2C0204-04 G	VOA glass 40mL	04MAR2012SW010	W2C0204-04 H	Sulfuric Amber Glass	04MAR2012SW010
W2C0204-05 A	Raw HDPE	04MAR2012SW011	W2C0204-05 B	Sulfuric HDPE	04MAR2012SW011
W2C0204-05 C	Filtered nitric HDPE	04MAR2012SW011	W2C0204-05 D	Nitric HDPE	04MAR2012SW011
W2C0204-05 E	NaOH HDPE	04MAR2012SW011	W2C0204-05 F	VOA glass 40mL	04MAR2012SW011
W2C0204-05 G	VOA glass 40mL	04MAR2012SW011	W2C0204-05 H	Sulfuric Amber Glass	04MAR2012SW011
W2C0204-06 A	Raw HDPE	05MAR2012SW012	W2C0204-06 B	Sulfuric HDPE	05MAR2012SW012
W2C0204-06 C	Filtered nitric HDPE	05MAR2012SW012	W2C0204-06 D	Nitric HDPE	05MAR2012SW012
W2C0204-06 E	NaOH HDPE	05MAR2012SW012	W2C0204-06 F	VOA glass 40mL	05MAR2012SW012
W2C0204-06 G	VOA glass 40mL	05MAR2012SW012	W2C0204-06 H	Sulfuric Amber Glass	05MAR2012SW012
W2C0204-07 A	Raw HDPE	05MAR2012SW013	W2C0204-07 B	Sulfuric HDPE	05MAR2012SW013
W2C0204-07 C	Filtered nitric HDPE	05MAR2012SW013	W2C0204-07 D	Nitric HDPE	05MAR2012SW013
W2C0204-07 E	NaOH HDPE	05MAR2012SW013	W2C0204-07 F	VOA glass 40mL	05MAR2012SW013

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: **W2C0204**

Reported: 28-Mar-12 11:59

Default Cooler (Received Temperature: 13.6°C) (Continued)

<u>Labnumber</u>	<u>Container</u>	<u>Client ID</u>	<u>Labnumber</u>	<u>Container</u>	<u>Client ID</u>
W2C0204-07 G	VOA glass 40mL	05MAR2012SW013	W2C0204-07 H	Sulfuric Amber Glass	05MAR2012SW013
W2C0204-08 A	Raw HDPE	05MAR2012SW113	W2C0204-08 B	Sulfuric HDPE	05MAR2012SW113
W2C0204-08 C	Filtered nitric HDPE	05MAR2012SW113	W2C0204-08 D	Nitric HDPE	05MAR2012SW113
W2C0204-08 E	NaOH HDPE	05MAR2012SW113	W2C0204-08 F	VOA glass 40mL	05MAR2012SW113
W2C0204-08 G	VOA glass 40mL	05MAR2012SW113	W2C0204-08 H	Sulfuric Amber Glass	05MAR2012SW113
W2C0204-08 I	Raw HDPE	05MAR2012SW113	W2C0204-08 J	Raw HDPE	05MAR2012SW113
W2C0204-08 K	Raw Amber Glass	05MAR2012SW113	W2C0204-09 A	Raw HDPE	05MAR2012SW014
W2C0204-09 B	Sulfuric HDPE	05MAR2012SW014	W2C0204-09 C	Filtered nitric HDPE	05MAR2012SW014
W2C0204-09 D	Nitric HDPE	05MAR2012SW014	W2C0204-09 E	NaOH HDPE	05MAR2012SW014
W2C0204-09 F	VOA glass 40mL	05MAR2012SW014	W2C0204-09 G	VOA glass 40mL	05MAR2012SW014
W2C0204-09 H	Sulfuric Amber Glass	05MAR2012SW014	W2C0204-10 A	Raw HDPE	05MAR2012SW201
W2C0204-10 B	Sulfuric HDPE	05MAR2012SW201	W2C0204-10 C	Filtered nitric HDPE	05MAR2012SW201
W2C0204-10 D	Nitric HDPE	05MAR2012SW201	W2C0204-10 E	NaOH HDPE	05MAR2012SW201
W2C0204-10 F	VOA glass 40mL	05MAR2012SW201	W2C0204-10 G	VOA glass 40mL	05MAR2012SW201
W2C0204-10 H	Sulfuric Amber Glass	05MAR2012SW201	W2C0204-11 A	Raw HDPE	05MAR2012SW015
W2C0204-11 B	Sulfuric HDPE	05MAR2012SW015	W2C0204-11 C	Filtered nitric HDPE	05MAR2012SW015
W2C0204-11 D	Nitric HDPE	05MAR2012SW015	W2C0204-11 E	NaOH HDPE	05MAR2012SW015
W2C0204-11 F	VOA glass 40mL	05MAR2012SW015	W2C0204-11 G	VOA glass 40mL	05MAR2012SW015
W2C0204-11 H	Sulfuric Amber Glass	05MAR2012SW015	W2C0204-12 A	Raw HDPE	03MAR2012SW005
W2C0204-12 B	Sulfuric HDPE	03MAR2012SW005	W2C0204-12 C	Filtered nitric HDPE	03MAR2012SW005
W2C0204-12 D	Nitric HDPE	03MAR2012SW005	W2C0204-12 E	NaOH HDPE	03MAR2012SW005
W2C0204-12 H	Sulfuric Amber Glass	03MAR2012SW005			



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2C0204**
Reported: 28-Mar-12 11:59

Client Sample ID: **04MAR2012SW007**

SVL Sample ID: **W2C0204-01 (Surface Water)**

Sample Report Page 1 of 3

Sampled: 04-Mar-12 10:30
Received: 12-Mar-12
Sampled By: FH

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W211262	DJA	03/19/12 11:25	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	0.122	mg/L	0.080	0.008		W211075	AS	03/27/12 11:20	
EPA 200.7	Barium	0.0053	mg/L	0.0020	0.0002		W211075	AS	03/27/12 11:20	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0002		W211075	AS	03/27/12 11:20	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W211075	AS	03/27/12 11:20	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0002		W211075	AS	03/27/12 11:20	
EPA 200.7	Calcium	0.173	mg/L	0.040	0.006		W211075	AS	03/27/12 11:20	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0003		W211075	AS	03/27/12 11:20	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W211075	AS	03/27/12 11:20	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.002		W211075	AS	03/27/12 11:20	
EPA 200.7	Iron	0.566	mg/L	0.060	0.008		W211075	AS	03/27/12 11:20	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0017		W211075	AS	03/27/12 11:20	
EPA 200.7	Magnesium	0.535	mg/L	0.060	0.010		W211075	AS	03/27/12 11:20	
EPA 200.7	Manganese	0.0149	mg/L	0.0040	0.0006		W211075	AS	03/27/12 11:20	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.0006		W211075	AS	03/27/12 11:20	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W211075	AS	03/27/12 11:20	
EPA 200.7	Potassium	< 0.50	mg/L	0.50	0.03		W211075	AS	03/27/12 11:20	
EPA 200.7	Silicon	3.82	mg/L	0.08	0.01		W211075	AS	03/27/12 11:20	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0003		W211075	AS	03/27/12 11:20	
EPA 200.7	Sodium	2.51	mg/L	0.50	0.02		W211075	AS	03/27/12 11:20	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0002		W211075	AS	03/27/12 11:20	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0002		W211075	AS	03/27/12 11:20	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0010		W211075	AS	03/27/12 11:20	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W211129	KWH	03/21/12 12:03	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W211129	KWH	03/21/12 12:03	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W211129	KWH	03/21/12 12:03	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000004	2.5	W211129	KWH	03/21/12 12:03	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000006	2.5	W211129	KWH	03/21/12 12:03	
SM 2340B	Hardness(as CaCO3)	2.63	mg/L	0.347	0.058		N/A		03/27/12 11:20	



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: **W2C0204**

Reported: 28-Mar-12 11:59

Client Sample ID: **04MAR2012SW007**

Sampled: 04-Mar-12 10:30

SVL Sample ID: **W2C0204-01 (Surface Water)**

Received: 12-Mar-12

Sample Report Page 2 of 3

Sampled By: FH

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	0.082	mg/L	0.080	0.016		W211078	AS	03/27/12 13:23	
EPA 200.7	Barium	0.0047	mg/L	0.0020	0.0004		W211078	AS	03/27/12 13:23	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0004		W211078	AS	03/27/12 13:23	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W211078	AS	03/27/12 13:23	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W211078	AS	03/27/12 13:23	
EPA 200.7	Calcium	0.201	mg/L	0.040	0.012		W211078	AS	03/27/12 13:23	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W211078	AS	03/27/12 13:23	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W211078	AS	03/27/12 13:23	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.003		W211078	AS	03/27/12 13:23	
EPA 200.7	Iron	0.264	mg/L	0.060	0.017		W211078	AS	03/27/12 13:23	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0034		W211078	AS	03/27/12 13:23	
EPA 200.7	Magnesium	0.511	mg/L	0.060	0.021		W211078	AS	03/27/12 13:23	
EPA 200.7	Manganese	0.0159	mg/L	0.0040	0.0011		W211078	AS	03/27/12 13:23	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W211078	AS	03/27/12 13:23	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W211078	AS	03/27/12 13:23	
EPA 200.7	Potassium	< 0.50	mg/L	0.50	0.07		W211078	AS	03/27/12 13:23	
EPA 200.7	Silicon	3.85	mg/L	0.08	0.03		W211078	AS	03/27/12 13:23	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0005		W211078	AS	03/27/12 13:23	
EPA 200.7	Sodium	2.45	mg/L	0.50	0.04		W211078	AS	03/27/12 13:23	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W211078	AS	03/27/12 13:23	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W211078	AS	03/27/12 13:23	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0021		W211078	AS	03/27/12 13:23	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W211131	KWH	03/21/12 10:58	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W211131	KWH	03/21/12 10:58	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W211131	KWH	03/21/12 10:58	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000033		W211131	KWH	03/21/12 10:58	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000049		W211131	KWH	03/21/12 10:58	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W211167	STA	03/15/12 15:17	
Classical Chemistry Parameters										
ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0005		W211292	IIT	03/15/12 15:25	
EPA 120.1	Specific conductance	22.4	µmhos/cm	5.00			W211173	RS	03/14/12 11:50	
EPA 180.1	Turbidity	1.25	NTU	0.100			W211135	SM	03/13/12 14:23	H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W211255	IIT	03/15/12 12:38	
EPA 350.1	Ammonia as N	0.047	mg/L	0.030	0.006		W212162	RHW	03/22/12 10:47	
EPA 353.2	Nitrate/Nitrite as N	< 0.050	mg/L	0.050	0.009		W212178	RHW	03/23/12 11:07	
EPA 410.4	Chemical Oxygen Demand	9.6	mg/L	5.0	2.5		W211284	SM	03/16/12 09:59	
SM 2320B/2310B	Bicarbonate	< 1.0	mg/L	1.0	0.1		W211163	DKS	03/15/12 09:02	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.1		W211163	DKS	03/15/12 09:02	
SM 2320B/2310B	Total Alkalinity	< 1.0	mg/L	1.0	0.1		W211163	DKS	03/15/12 09:02	
SM 2540 C	Total Diss. Solids	19	mg/L	10			W211172	RS	03/14/12 17:35	H3
SM 2540 D	Total Susp. Solids	< 5.0	mg/L	5.0			W211170	RS	03/14/12 17:35	H3
SM 4500 H B	pH @23.0°C	5.37	pH Units				W211163	DKS	03/15/12 09:02	
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W211256	IIT	03/15/12 13:40	
SM 4500-P-E	Phosphorus	< 0.010	mg/L	0.010	0.005		W211351	SM	03/19/12 15:12	
SM 5310B	Total Organic Carbon	3.45	mg/L	1.00	0.27		W211336	SM	03/19/12 20:05	



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Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: **W2C0204**

Reported: 28-Mar-12 11:59

Client Sample ID: **04MAR2012SW007**

SVL Sample ID: **W2C0204-01 (Surface Water)**

Sample Report Page 3 of 3

Sampled: 04-Mar-12 10:30

Received: 12-Mar-12

Sampled By: FH

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	4.61	mg/L	0.20	0.07		W212103	AEW	03/20/12 13:28	
EPA 300.0	Fluoride	< 0.10	mg/L	0.10	0.02		W212103	AEW	03/20/12 13:28	
EPA 300.0	Sulfate as SO4	< 0.30	mg/L	0.30	0.04		W212103	AEW	03/20/12 13:28	

Cation/Anion Balance and TDS Ratios

Cation Sum: 0.18 meq/L Anion Sum: 0.14 meq/L C/A Balance: 14.30 % Calculated TDS: 18 TDS/cTDS: 1.04 TDS/eC: 0.85

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Tetra Tech EM, Inc. (Boise)
 3380 Americana Terrace, Suite 201
 Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
 Work Order: **W2C0204**
 Reported: 28-Mar-12 11:59

Client Sample ID: **04MAR2012SW008**

SVL Sample ID: **W2C0204-02 (Surface Water)**

Sample Report Page 1 of 3

Sampled: 04-Mar-12 12:50
 Received: 12-Mar-12
 Sampled By: FH

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W211262	DJA	03/19/12 11:31	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	7.22	mg/L	0.080	0.008		W211075	AS	03/27/12 11:36	
EPA 200.7	Barium	0.0818	mg/L	0.0020	0.0002		W211075	AS	03/27/12 11:36	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0002		W211075	AS	03/27/12 11:36	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W211075	AS	03/27/12 11:36	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0002		W211075	AS	03/27/12 11:36	
EPA 200.7	Calcium	0.504	mg/L	0.040	0.006		W211075	AS	03/27/12 11:36	
EPA 200.7	Chromium	0.0446	mg/L	0.0060	0.0003		W211075	AS	03/27/12 11:36	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W211075	AS	03/27/12 11:36	
EPA 200.7	Copper	0.029	mg/L	0.010	0.002		W211075	AS	03/27/12 11:36	
EPA 200.7	Iron	7.02	mg/L	0.060	0.008		W211075	AS	03/27/12 11:36	
EPA 200.7	Lead	0.0144	mg/L	0.0075	0.0017		W211075	AS	03/27/12 11:36	
EPA 200.7	Magnesium	1.17	mg/L	0.060	0.010		W211075	AS	03/27/12 11:36	
EPA 200.7	Manganese	0.0608	mg/L	0.0040	0.0006		W211075	AS	03/27/12 11:36	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.0006		W211075	AS	03/27/12 11:36	
EPA 200.7	Nickel	0.028	mg/L	0.010	0.002		W211075	AS	03/27/12 11:36	
EPA 200.7	Potassium	0.74	mg/L	0.50	0.03		W211075	AS	03/27/12 11:36	
EPA 200.7	Silicon	9.78	mg/L	0.08	0.01		W211075	AS	03/27/12 11:36	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0003		W211075	AS	03/27/12 11:36	
EPA 200.7	Sodium	2.75	mg/L	0.50	0.02		W211075	AS	03/27/12 11:36	
EPA 200.7	Titanium	0.0225	mg/L	0.0050	0.0002		W211075	AS	03/27/12 11:36	
EPA 200.7	Vanadium	0.0153	mg/L	0.0050	0.0002		W211075	AS	03/27/12 11:36	
EPA 200.7	Zinc	0.0177	mg/L	0.0100	0.0010		W211075	AS	03/27/12 11:36	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W211129	KWH	03/21/12 12:14	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W211129	KWH	03/21/12 12:14	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W211129	KWH	03/21/12 12:14	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000004	2.5	W211129	KWH	03/21/12 12:14	
EPA 200.8	Uranium	0.00100	mg/L	0.00100	0.000006	2.5	W211129	KWH	03/21/12 12:14	
SM 2340B	Hardness(as CaCO3)	6.09	mg/L	0.347	0.058		N/A		03/27/12 11:36	



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2C0204**
Reported: 28-Mar-12 11:59

Client Sample ID: **04MAR2012SW008**

SVL Sample ID: **W2C0204-02 (Surface Water)**

Sample Report Page 2 of 3

Sampled: 04-Mar-12 12:50
Received: 12-Mar-12
Sampled By: FH

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.016		W211078	AS	03/27/12 13:39	
EPA 200.7	Barium	0.0033	mg/L	0.0020	0.0004		W211078	AS	03/27/12 13:39	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0004		W211078	AS	03/27/12 13:39	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W211078	AS	03/27/12 13:39	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W211078	AS	03/27/12 13:39	
EPA 200.7	Calcium	0.412	mg/L	0.040	0.012		W211078	AS	03/27/12 13:39	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W211078	AS	03/27/12 13:39	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W211078	AS	03/27/12 13:39	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.003		W211078	AS	03/27/12 13:39	
EPA 200.7	Iron	0.364	mg/L	0.060	0.017		W211078	AS	03/27/12 13:39	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0034		W211078	AS	03/27/12 13:39	
EPA 200.7	Magnesium	0.776	mg/L	0.060	0.021		W211078	AS	03/27/12 13:39	
EPA 200.7	Manganese	0.0345	mg/L	0.0040	0.0011		W211078	AS	03/27/12 13:39	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W211078	AS	03/27/12 13:39	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W211078	AS	03/27/12 13:39	
EPA 200.7	Potassium	< 0.50	mg/L	0.50	0.07		W211078	AS	03/27/12 13:39	
EPA 200.7	Silicon	4.02	mg/L	0.08	0.03		W211078	AS	03/27/12 13:39	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0005		W211078	AS	03/27/12 13:39	
EPA 200.7	Sodium	2.65	mg/L	0.50	0.04		W211078	AS	03/27/12 13:39	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W211078	AS	03/27/12 13:39	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W211078	AS	03/27/12 13:39	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0021		W211078	AS	03/27/12 13:39	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W211131	KWH	03/21/12 11:03	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W211131	KWH	03/21/12 11:03	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W211131	KWH	03/21/12 11:03	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000033		W211131	KWH	03/21/12 11:03	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000049		W211131	KWH	03/21/12 11:03	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W211167	STA	03/15/12 15:19	
Classical Chemistry Parameters										
ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0005		W211292	IIT	03/15/12 15:27	
EPA 120.1	Specific conductance	24.4	µmhos/cm	5.00			W211173	RS	03/14/12 11:50	
EPA 180.1	Turbidity	782	NTU	2.50		25	W211135	SM	03/13/12 14:23	D2,H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W211255	IIT	03/15/12 12:40	
EPA 350.1	Ammonia as N	0.059	mg/L	0.030	0.006		W212162	RHW	03/22/12 10:49	
EPA 353.2	Nitrate/Nitrite as N	0.060	mg/L	0.050	0.009		W212178	RHW	03/23/12 11:08	
EPA 410.4	Chemical Oxygen Demand	18.9	mg/L	5.0	2.5		W211284	SM	03/16/12 09:59	
SM 2320B/2310B	Bicarbonate	3.0	mg/L	1.0	0.1		W211163	DKS	03/15/12 09:05	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.1		W211163	DKS	03/15/12 09:05	
SM 2320B/2310B	Total Alkalinity	3.0	mg/L	1.0	0.1		W211163	DKS	03/15/12 09:05	
SM 2540 C	Total Diss. Solids	84	mg/L	10			W211172	RS	03/14/12 17:35	H3
SM 2540 D	Total Susp. Solids	379	mg/L	5.0			W211170	RS	03/14/12 17:35	H3
SM 4500 H B	pH @24.0°C	6.18	pH Units				W211163	DKS	03/15/12 09:05	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W211256	IIT	03/15/12 13:42	
SM 4500-P-E	Phosphorus	0.135	mg/L	0.010	0.005		W211351	SM	03/19/12 15:12	
SM 5310B	Total Organic Carbon	5.32	mg/L	1.00	0.27		W211336	SM	03/19/12 20:17	



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Kellogg ID 83837-0929

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Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: **W2C0204**

Reported: 28-Mar-12 11:59

Client Sample ID: **04MAR2012SW008**

SVL Sample ID: **W2C0204-02 (Surface Water)**

Sample Report Page 3 of 3

Sampled: 04-Mar-12 12:50

Received: 12-Mar-12

Sampled By: FH

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	4.33	mg/L	0.20	0.07		W212103	AEW	03/20/12 14:03	
EPA 300.0	Fluoride	< 0.10	mg/L	0.10	0.02		W212103	AEW	03/20/12 14:03	
EPA 300.0	Sulfate as SO4	0.43	mg/L	0.30	0.04		W212103	AEW	03/20/12 14:03	

Cation/Anion Balance and TDS Ratios

Cation Sum: 0.22 meq/L Anion Sum: 0.20 meq/L C/A Balance: 6.07 % Calculated TDS: 30 TDS/cTDS: 2.80 TDS/eC: 3.44

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2C0204**
Reported: 28-Mar-12 11:59

Client Sample ID: **04MAR2012SW009**

SVL Sample ID: **W2C0204-03 (Surface Water)**

Sample Report Page 1 of 3

Sampled: 04-Mar-12 14:15
Received: 12-Mar-12
Sampled By: FH

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total)										
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W211262	DJA	03/19/12 11:34	
Metals (Total Recoverable--reportable as Total per 40 CFR 136)										
EPA 200.7	Aluminum	0.798	mg/L	0.080	0.008		W211075	AS	03/27/12 11:42	
EPA 200.7	Barium	0.0088	mg/L	0.0020	0.0002		W211075	AS	03/27/12 11:42	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0002		W211075	AS	03/27/12 11:42	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W211075	AS	03/27/12 11:42	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0002		W211075	AS	03/27/12 11:42	
EPA 200.7	Calcium	0.767	mg/L	0.040	0.006		W211075	AS	03/27/12 11:42	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0003		W211075	AS	03/27/12 11:42	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W211075	AS	03/27/12 11:42	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.002		W211075	AS	03/27/12 11:42	
EPA 200.7	Iron	4.75	mg/L	0.060	0.008		W211075	AS	03/27/12 11:42	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0017		W211075	AS	03/27/12 11:42	
EPA 200.7	Magnesium	1.04	mg/L	0.060	0.010		W211075	AS	03/27/12 11:42	
EPA 200.7	Manganese	0.0346	mg/L	0.0040	0.0006		W211075	AS	03/27/12 11:42	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.0006		W211075	AS	03/27/12 11:42	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W211075	AS	03/27/12 11:42	
EPA 200.7	Potassium	0.57	mg/L	0.50	0.03		W211075	AS	03/27/12 11:42	
EPA 200.7	Silicon	3.96	mg/L	0.08	0.01		W211075	AS	03/27/12 11:42	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0003		W211075	AS	03/27/12 11:42	
EPA 200.7	Sodium	2.89	mg/L	0.50	0.02		W211075	AS	03/27/12 11:42	
EPA 200.7	Titanium	0.0063	mg/L	0.0050	0.0002		W211075	AS	03/27/12 11:42	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0002		W211075	AS	03/27/12 11:42	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0010		W211075	AS	03/27/12 11:42	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W211129	KWH	03/21/12 12:19	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W211129	KWH	03/21/12 12:19	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W211129	KWH	03/21/12 12:19	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000004	2.5	W211129	KWH	03/21/12 12:19	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000006	2.5	W211129	KWH	03/21/12 12:19	
SM 2340B	Hardness(as CaCO3)	6.19	mg/L	0.347	0.058		N/A		03/27/12 11:42	



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: **W2C0204**

Reported: 28-Mar-12 11:59

Client Sample ID: **04MAR2012SW009**

SVL Sample ID: **W2C0204-03 (Surface Water)**

Sample Report Page 2 of 3

Sampled: 04-Mar-12 14:15

Received: 12-Mar-12

Sampled By: FH

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.016		W211078	AS	03/27/12 13:45	
EPA 200.7	Barium	0.0054	mg/L	0.0020	0.0004		W211078	AS	03/27/12 13:45	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0004		W211078	AS	03/27/12 13:45	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W211078	AS	03/27/12 13:45	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W211078	AS	03/27/12 13:45	
EPA 200.7	Calcium	0.722	mg/L	0.040	0.012		W211078	AS	03/27/12 13:45	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W211078	AS	03/27/12 13:45	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W211078	AS	03/27/12 13:45	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.003		W211078	AS	03/27/12 13:45	
EPA 200.7	Iron	0.869	mg/L	0.060	0.017		W211078	AS	03/27/12 13:45	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0034		W211078	AS	03/27/12 13:45	
EPA 200.7	Magnesium	0.938	mg/L	0.060	0.021		W211078	AS	03/27/12 13:45	
EPA 200.7	Manganese	0.0297	mg/L	0.0040	0.0011		W211078	AS	03/27/12 13:45	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W211078	AS	03/27/12 13:45	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W211078	AS	03/27/12 13:45	
EPA 200.7	Potassium	< 0.50	mg/L	0.50	0.07		W211078	AS	03/27/12 13:45	
EPA 200.7	Silicon	3.37	mg/L	0.08	0.03		W211078	AS	03/27/12 13:45	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0005		W211078	AS	03/27/12 13:45	
EPA 200.7	Sodium	2.74	mg/L	0.50	0.04		W211078	AS	03/27/12 13:45	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W211078	AS	03/27/12 13:45	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W211078	AS	03/27/12 13:45	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0021		W211078	AS	03/27/12 13:45	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W211131	KWH	03/21/12 11:05	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W211131	KWH	03/21/12 11:05	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W211131	KWH	03/21/12 11:05	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000033		W211131	KWH	03/21/12 11:05	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000049		W211131	KWH	03/21/12 11:05	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W211167	STA	03/15/12 15:21	
Classical Chemistry Parameters										
ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0005		W211292	IIT	03/15/12 15:29	
EPA 120.1	Specific conductance	27.8	µmhos/cm	5.00			W211173	RS	03/14/12 11:50	
EPA 180.1	Turbidity	52.0	NTU	5.00		5	W211135	SM	03/13/12 14:23	D2,H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W211255	IIT	03/15/12 12:42	
EPA 350.1	Ammonia as N	0.157	mg/L	0.030	0.006		W212254	RHW	03/26/12 11:26	
EPA 353.2	Nitrate/Nitrite as N	0.082	mg/L	0.050	0.009		W212178	RHW	03/23/12 11:10	
EPA 410.4	Chemical Oxygen Demand	8.1	mg/L	5.0	2.5		W211284	SM	03/16/12 09:59	
SM 2320B/2310B	Bicarbonate	4.2	mg/L	1.0	0.1		W211163	DKS	03/15/12 09:09	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.1		W211163	DKS	03/15/12 09:09	
SM 2320B/2310B	Total Alkalinity	4.2	mg/L	1.0	0.1		W211163	DKS	03/15/12 09:09	
SM 2540 C	Total Diss. Solids	62	mg/L	10			W211172	RS	03/14/12 17:35	H3
SM 2540 D	Total Susp. Solids	22.0	mg/L	5.0			W211170	RS	03/14/12 17:35	H3
SM 4500 H B	pH @23.0°C	6.33	pH Units				W211163	DKS	03/15/12 09:09	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W211256	IIT	03/15/12 13:44	
SM 4500-P-E	Phosphorus	< 0.010	mg/L	0.010	0.005		W211351	SM	03/19/12 15:12	
SM 5310B	Total Organic Carbon	8.79	mg/L	1.00	0.27		W211336	SM	03/19/12 20:30	



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Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: **W2C0204**

Reported: 28-Mar-12 11:59

Client Sample ID: **04MAR2012SW009**

SVL Sample ID: **W2C0204-03 (Surface Water)**

Sample Report Page 3 of 3

Sampled: 04-Mar-12 14:15

Received: 12-Mar-12

Sampled By: FH

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	4.23	mg/L	0.20	0.07		W212103	AEW	03/20/12 14:14	
EPA 300.0	Fluoride	< 0.10	mg/L	0.10	0.02		W212103	AEW	03/20/12 14:14	
EPA 300.0	Sulfate as SO4	0.38	mg/L	0.30	0.04		W212103	AEW	03/20/12 14:14	

Cation/Anion Balance and TDS Ratios

Cation Sum: 0.28 meq/L Anion Sum: 0.22 meq/L C/A Balance: 12.30 % Calculated TDS: 22 TDS/cTDS: 2.79 TDS/eC: 2.23

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Tetra Tech EM, Inc. (Boise)
 3380 Americana Terrace, Suite 201
 Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: **W2C0204**

Reported: 28-Mar-12 11:59

Client Sample ID: **04MAR2012SW010**

SVL Sample ID: **W2C0204-04 (Surface Water)**

Sample Report Page 1 of 3

Sampled: 04-Mar-12 15:20

Received: 12-Mar-12

Sampled By: FH

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W211262	DJA	03/19/12 11:36	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	0.593	mg/L	0.080	0.008		W211075	AS	03/27/12 11:47	
EPA 200.7	Barium	0.0082	mg/L	0.0020	0.0002		W211075	AS	03/27/12 11:47	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0002		W211075	AS	03/27/12 11:47	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W211075	AS	03/27/12 11:47	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0002		W211075	AS	03/27/12 11:47	
EPA 200.7	Calcium	1.09	mg/L	0.040	0.006		W211075	AS	03/27/12 11:47	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0003		W211075	AS	03/27/12 11:47	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W211075	AS	03/27/12 11:47	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.002		W211075	AS	03/27/12 11:47	
EPA 200.7	Iron	6.07	mg/L	0.060	0.008		W211075	AS	03/27/12 11:47	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0017		W211075	AS	03/27/12 11:47	
EPA 200.7	Magnesium	1.13	mg/L	0.060	0.010		W211075	AS	03/27/12 11:47	
EPA 200.7	Manganese	0.0543	mg/L	0.0040	0.0006		W211075	AS	03/27/12 11:47	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.0006		W211075	AS	03/27/12 11:47	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W211075	AS	03/27/12 11:47	
EPA 200.7	Potassium	0.69	mg/L	0.50	0.03		W211075	AS	03/27/12 11:47	
EPA 200.7	Silicon	3.99	mg/L	0.08	0.01		W211075	AS	03/27/12 11:47	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0003		W211075	AS	03/27/12 11:47	
EPA 200.7	Sodium	2.85	mg/L	0.50	0.02		W211075	AS	03/27/12 11:47	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0002		W211075	AS	03/27/12 11:47	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0002		W211075	AS	03/27/12 11:47	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0010		W211075	AS	03/27/12 11:47	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W211129	KWH	03/21/12 12:21	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W211129	KWH	03/21/12 12:21	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W211129	KWH	03/21/12 12:21	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000004	2.5	W211129	KWH	03/21/12 12:21	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000006	2.5	W211129	KWH	03/21/12 12:21	
SM 2340B	Hardness(as CaCO3)	7.37	mg/L	0.347	0.058		N/A		03/27/12 11:47	



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: **W2C0204**

Reported: 28-Mar-12 11:59

Client Sample ID: **04MAR2012SW010**

SVL Sample ID: **W2C0204-04 (Surface Water)**

Sample Report Page 2 of 3

Sampled: 04-Mar-12 15:20

Received: 12-Mar-12

Sampled By: FH

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.016		W211078	AS	03/27/12 13:50	
EPA 200.7	Barium	0.0048	mg/L	0.0020	0.0004		W211078	AS	03/27/12 13:50	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0004		W211078	AS	03/27/12 13:50	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W211078	AS	03/27/12 13:50	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W211078	AS	03/27/12 13:50	
EPA 200.7	Calcium	1.07	mg/L	0.040	0.012		W211078	AS	03/27/12 13:50	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W211078	AS	03/27/12 13:50	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W211078	AS	03/27/12 13:50	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.003		W211078	AS	03/27/12 13:50	
EPA 200.7	Iron	0.879	mg/L	0.060	0.017		W211078	AS	03/27/12 13:50	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0034		W211078	AS	03/27/12 13:50	
EPA 200.7	Magnesium	1.03	mg/L	0.060	0.021		W211078	AS	03/27/12 13:50	
EPA 200.7	Manganese	0.0467	mg/L	0.0040	0.0011		W211078	AS	03/27/12 13:50	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W211078	AS	03/27/12 13:50	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W211078	AS	03/27/12 13:50	
EPA 200.7	Potassium	0.64	mg/L	0.50	0.07		W211078	AS	03/27/12 13:50	
EPA 200.7	Silicon	3.64	mg/L	0.08	0.03		W211078	AS	03/27/12 13:50	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0005		W211078	AS	03/27/12 13:50	
EPA 200.7	Sodium	2.77	mg/L	0.50	0.04		W211078	AS	03/27/12 13:50	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W211078	AS	03/27/12 13:50	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W211078	AS	03/27/12 13:50	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0021		W211078	AS	03/27/12 13:50	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W211131	KWH	03/21/12 11:07	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W211131	KWH	03/21/12 11:07	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W211131	KWH	03/21/12 11:07	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000033		W211131	KWH	03/21/12 11:07	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000049		W211131	KWH	03/21/12 11:07	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W211167	STA	03/15/12 15:26	
Classical Chemistry Parameters										
ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0005		W211292	IIT	03/15/12 15:37	
EPA 120.1	Specific conductance	31.3	µmhos/cm	5.00			W211173	RS	03/14/12 11:50	
EPA 180.1	Turbidity	52.0	NTU	5.00		5	W211135	SM	03/13/12 14:23	D2,H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W211255	IIT	03/15/12 12:44	
EPA 350.1	Ammonia as N	0.182	mg/L	0.030	0.006		W212162	RHW	03/22/12 10:50	
EPA 353.2	Nitrate/Nitrite as N	0.104	mg/L	0.050	0.009		W212178	RHW	03/23/12 11:11	
EPA 410.4	Chemical Oxygen Demand	21.9	mg/L	5.0	2.5		W211284	SM	03/16/12 09:59	
SM 2320B/2310B	Bicarbonate	6.2	mg/L	1.0	0.1		W211163	DKS	03/15/12 09:13	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.1		W211163	DKS	03/15/12 09:13	
SM 2320B/2310B	Total Alkalinity	6.2	mg/L	1.0	0.1		W211163	DKS	03/15/12 09:13	
SM 2540 C	Total Diss. Solids	47	mg/L	10			W211172	RS	03/14/12 17:35	H3
SM 2540 D	Total Susp. Solids	16.0	mg/L	5.0			W211170	RS	03/14/12 17:35	H3
SM 4500 H B	pH @23.0°C	6.53	pH Units				W211163	DKS	03/15/12 09:13	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W211256	IIT	03/15/12 13:46	
SM 4500-P-E	Phosphorus	0.015	mg/L	0.010	0.005		W211351	SM	03/19/12 15:12	
SM 5310B	Total Organic Carbon	8.41	mg/L	1.00	0.27		W211336	SM	03/19/12 20:43	



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

(208) 784-1258

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Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: **W2C0204**

Reported: 28-Mar-12 11:59

Client Sample ID: **04MAR2012SW010**

SVL Sample ID: **W2C0204-04 (Surface Water)**

Sample Report Page 3 of 3

Sampled: 04-Mar-12 15:20

Received: 12-Mar-12

Sampled By: FH

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	3.98	mg/L	0.20	0.07		W212103	AEW	03/20/12 14:25	
EPA 300.0	Fluoride	< 0.10	mg/L	0.10	0.02		W212103	AEW	03/20/12 14:25	
EPA 300.0	Sulfate as SO4	0.58	mg/L	0.30	0.04		W212103	AEW	03/20/12 14:25	

Cation/Anion Balance and TDS Ratios

Cation Sum: 0.32 meq/L Anion Sum: 0.26 meq/L C/A Balance: 11.42 % Calculated TDS: 25 TDS/cTDS: 1.90 TDS/eC: 1.50

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: **Suriname Merian 2012 / 113-93245**

Work Order: **W2C0204**

Reported: 28-Mar-12 11:59

Client Sample ID: **04MAR2012SW011**

SVL Sample ID: **W2C0204-05 (Surface Water)**

Sample Report Page 1 of 3

Sampled: 04-Mar-12 16:00

Received: 12-Mar-12

Sampled By: FH

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W211268	DJA	03/19/12 11:52	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	0.217	mg/L	0.080	0.008		W211075	AS	03/27/12 11:52	
EPA 200.7	Barium	0.0076	mg/L	0.0020	0.0002		W211075	AS	03/27/12 11:52	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0002		W211075	AS	03/27/12 11:52	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W211075	AS	03/27/12 11:52	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0002		W211075	AS	03/27/12 11:52	
EPA 200.7	Calcium	1.05	mg/L	0.040	0.006		W211075	AS	03/27/12 11:52	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0003		W211075	AS	03/27/12 11:52	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W211075	AS	03/27/12 11:52	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.002		W211075	AS	03/27/12 11:52	
EPA 200.7	Iron	4.67	mg/L	0.060	0.008		W211075	AS	03/27/12 11:52	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0017		W211075	AS	03/27/12 11:52	
EPA 200.7	Magnesium	1.09	mg/L	0.060	0.010		W211075	AS	03/27/12 11:52	
EPA 200.7	Manganese	0.0445	mg/L	0.0040	0.0006		W211075	AS	03/27/12 11:52	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.0006		W211075	AS	03/27/12 11:52	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W211075	AS	03/27/12 11:52	
EPA 200.7	Potassium	< 0.50	mg/L	0.50	0.03		W211075	AS	03/27/12 11:52	
EPA 200.7	Silicon	3.91	mg/L	0.08	0.01		W211075	AS	03/27/12 11:52	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0003		W211075	AS	03/27/12 11:52	
EPA 200.7	Sodium	2.82	mg/L	0.50	0.02		W211075	AS	03/27/12 11:52	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0002		W211075	AS	03/27/12 11:52	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0002		W211075	AS	03/27/12 11:52	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0010		W211075	AS	03/27/12 11:52	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W211129	KWH	03/21/12 12:23	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W211129	KWH	03/21/12 12:23	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W211129	KWH	03/21/12 12:23	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000004	2.5	W211129	KWH	03/21/12 12:23	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000006	2.5	W211129	KWH	03/21/12 12:23	
SM 2340B	Hardness(as CaCO3)	7.14	mg/L	0.347	0.058		N/A		03/27/12 11:52	



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2C0204**
Reported: 28-Mar-12 11:59

Client Sample ID: **04MAR2012SW011**

SVL Sample ID: **W2C0204-05 (Surface Water)**

Sample Report Page 2 of 3

Sampled: 04-Mar-12 16:00
Received: 12-Mar-12
Sampled By: FH

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.016		W211078	AS	03/27/12 13:55	
EPA 200.7	Barium	0.0062	mg/L	0.0020	0.0004		W211078	AS	03/27/12 13:55	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0004		W211078	AS	03/27/12 13:55	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W211078	AS	03/27/12 13:55	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W211078	AS	03/27/12 13:55	
EPA 200.7	Calcium	1.06	mg/L	0.040	0.012		W211078	AS	03/27/12 13:55	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W211078	AS	03/27/12 13:55	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W211078	AS	03/27/12 13:55	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.003		W211078	AS	03/27/12 13:55	
EPA 200.7	Iron	1.03	mg/L	0.060	0.017		W211078	AS	03/27/12 13:55	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0034		W211078	AS	03/27/12 13:55	
EPA 200.7	Magnesium	1.04	mg/L	0.060	0.021		W211078	AS	03/27/12 13:55	
EPA 200.7	Manganese	0.0397	mg/L	0.0040	0.0011		W211078	AS	03/27/12 13:55	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W211078	AS	03/27/12 13:55	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W211078	AS	03/27/12 13:55	
EPA 200.7	Potassium	< 0.50	mg/L	0.50	0.07		W211078	AS	03/27/12 13:55	
EPA 200.7	Silicon	3.83	mg/L	0.08	0.03		W211078	AS	03/27/12 13:55	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0005		W211078	AS	03/27/12 13:55	
EPA 200.7	Sodium	2.82	mg/L	0.50	0.04		W211078	AS	03/27/12 13:55	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W211078	AS	03/27/12 13:55	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W211078	AS	03/27/12 13:55	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0021		W211078	AS	03/27/12 13:55	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W211131	KWH	03/21/12 11:08	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W211131	KWH	03/21/12 11:08	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W211131	KWH	03/21/12 11:08	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000033		W211131	KWH	03/21/12 11:08	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000049		W211131	KWH	03/21/12 11:08	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W211167	STA	03/15/12 15:27	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0005		W211292	IIT	03/15/12 15:39	
EPA 120.1	Specific conductance	30.3	µmhos/cm	5.00			W211173	RS	03/14/12 11:50	
EPA 180.1	Turbidity	21.6	NTU	0.100			W211135	SM	03/13/12 14:23	H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W211255	IIT	03/15/12 12:46	
EPA 350.1	Ammonia as N	0.089	mg/L	0.030	0.006		W212254	RHW	03/26/12 11:27	
EPA 353.2	Nitrate/Nitrite as N	0.076	mg/L	0.050	0.009		W212178	RHW	03/23/12 11:13	
EPA 410.4	Chemical Oxygen Demand	7.0	mg/L	5.0	2.5		W211284	SM	03/16/12 09:59	
SM 2320B/2310B	Bicarbonate	5.6	mg/L	1.0	0.1		W211163	DKS	03/15/12 09:19	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.1		W211163	DKS	03/15/12 09:19	
SM 2320B/2310B	Total Alkalinity	5.6	mg/L	1.0	0.1		W211163	DKS	03/15/12 09:19	
SM 2540 C	Total Diss. Solids	41	mg/L	10			W211172	RS	03/14/12 17:35	H3
SM 2540 D	Total Susp. Solids	9.0	mg/L	5.0			W211170	RS	03/14/12 17:35	H3
SM 4500 H B	pH @23.0°C	6.39	pH Units				W211163	DKS	03/15/12 09:19	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W211256	IIT	03/15/12 13:54	
SM 4500-P-E	Phosphorus	< 0.010	mg/L	0.010	0.005		W211351	SM	03/19/12 15:12	
SM 5310B	Total Organic Carbon	6.60	mg/L	1.00	0.27		W211336	SM	03/19/12 21:42	



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Kellogg ID 83837-0929

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Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: **W2C0204**

Reported: 28-Mar-12 11:59

Client Sample ID: **04MAR2012SW011**

SVL Sample ID: **W2C0204-05 (Surface Water)**

Sample Report Page 3 of 3

Sampled: 04-Mar-12 16:00

Received: 12-Mar-12

Sampled By: FH

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	4.08	mg/L	0.20	0.07		W212103	AEW	03/20/12 14:37	
EPA 300.0	Fluoride	< 0.10	mg/L	0.10	0.02		W212103	AEW	03/20/12 14:37	
EPA 300.0	Sulfate as SO4	0.44	mg/L	0.30	0.04		W212103	AEW	03/20/12 14:37	

Cation/Anion Balance and TDS Ratios

Cation Sum: 0.31 meq/L Anion Sum: 0.24 meq/L C/A Balance: 11.86 % Calculated TDS: 24 TDS/cTDS: 1.73 TDS/eC: 1.35

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2C0204**
Reported: 28-Mar-12 11:59

Client Sample ID: **05MAR2012SW012**

SVL Sample ID: **W2C0204-06 (Surface Water)**

Sample Report Page 1 of 3

Sampled: 05-Mar-12 09:32
Received: 12-Mar-12
Sampled By: FH

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W211268	DJA	03/19/12 11:57	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	2.55	mg/L	0.080	0.008		W211075	AS	03/27/12 11:58	
EPA 200.7	Barium	0.0123	mg/L	0.0020	0.0002		W211075	AS	03/27/12 11:58	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0002		W211075	AS	03/27/12 11:58	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W211075	AS	03/27/12 11:58	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0002		W211075	AS	03/27/12 11:58	
EPA 200.7	Calcium	1.29	mg/L	0.040	0.006		W211075	AS	03/27/12 11:58	
EPA 200.7	Chromium	0.0124	mg/L	0.0060	0.0003		W211075	AS	03/27/12 11:58	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W211075	AS	03/27/12 11:58	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.002		W211075	AS	03/27/12 11:58	
EPA 200.7	Iron	11.1	mg/L	0.060	0.008		W211075	AS	03/27/12 11:58	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0017		W211075	AS	03/27/12 11:58	
EPA 200.7	Magnesium	1.48	mg/L	0.060	0.010		W211075	AS	03/27/12 11:58	
EPA 200.7	Manganese	0.117	mg/L	0.0040	0.0006		W211075	AS	03/27/12 11:58	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.0006		W211075	AS	03/27/12 11:58	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W211075	AS	03/27/12 11:58	
EPA 200.7	Potassium	1.07	mg/L	0.50	0.03		W211075	AS	03/27/12 11:58	
EPA 200.7	Silicon	4.72	mg/L	0.08	0.01		W211075	AS	03/27/12 11:58	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0003		W211075	AS	03/27/12 11:58	
EPA 200.7	Sodium	3.81	mg/L	0.50	0.02		W211075	AS	03/27/12 11:58	
EPA 200.7	Titanium	0.0280	mg/L	0.0050	0.0002		W211075	AS	03/27/12 11:58	
EPA 200.7	Vanadium	0.0103	mg/L	0.0050	0.0002		W211075	AS	03/27/12 11:58	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0010		W211075	AS	03/27/12 11:58	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W211129	KWH	03/21/12 12:24	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W211129	KWH	03/21/12 12:24	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W211129	KWH	03/21/12 12:24	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000004	2.5	W211129	KWH	03/21/12 12:24	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000006	2.5	W211129	KWH	03/21/12 12:24	
SM 2340B	Hardness(as CaCO3)	9.32	mg/L	0.347	0.058		N/A		03/27/12 11:58	



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2C0204**
Reported: 28-Mar-12 11:59

Client Sample ID: **05MAR2012SW012**

SVL Sample ID: **W2C0204-06 (Surface Water)**

Sample Report Page 2 of 3

Sampled: 05-Mar-12 09:32
Received: 12-Mar-12
Sampled By: FH

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.016		W211078	AS	03/27/12 14:12	
EPA 200.7	Barium	0.0057	mg/L	0.0020	0.0004		W211078	AS	03/27/12 14:12	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0004		W211078	AS	03/27/12 14:12	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W211078	AS	03/27/12 14:12	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W211078	AS	03/27/12 14:12	
EPA 200.7	Calcium	1.16	mg/L	0.040	0.012		W211078	AS	03/27/12 14:12	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W211078	AS	03/27/12 14:12	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W211078	AS	03/27/12 14:12	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.003		W211078	AS	03/27/12 14:12	
EPA 200.7	Iron	0.905	mg/L	0.060	0.017		W211078	AS	03/27/12 14:12	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0034		W211078	AS	03/27/12 14:12	
EPA 200.7	Magnesium	1.29	mg/L	0.060	0.021		W211078	AS	03/27/12 14:12	
EPA 200.7	Manganese	0.0968	mg/L	0.0040	0.0011		W211078	AS	03/27/12 14:12	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W211078	AS	03/27/12 14:12	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W211078	AS	03/27/12 14:12	
EPA 200.7	Potassium	0.98	mg/L	0.50	0.07		W211078	AS	03/27/12 14:12	
EPA 200.7	Silicon	3.28	mg/L	0.08	0.03		W211078	AS	03/27/12 14:12	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0005		W211078	AS	03/27/12 14:12	
EPA 200.7	Sodium	3.75	mg/L	0.50	0.04		W211078	AS	03/27/12 14:12	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W211078	AS	03/27/12 14:12	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W211078	AS	03/27/12 14:12	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0021		W211078	AS	03/27/12 14:12	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W211131	KWH	03/21/12 11:10	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W211131	KWH	03/21/12 11:10	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W211131	KWH	03/21/12 11:10	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000033		W211131	KWH	03/21/12 11:10	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000049		W211131	KWH	03/21/12 11:10	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W211167	STA	03/15/12 15:29	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0005		W211292	IIT	03/15/12 15:41	
EPA 120.1	Specific conductance	43.7	µmhos/cm	5.00			W211173	RS	03/14/12 11:50	
EPA 180.1	Turbidity	292	NTU	1.00		10	W211135	SM	03/13/12 14:23	D2,H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W211255	IIT	03/15/12 12:48	
EPA 350.1	Ammonia as N	0.514	mg/L	0.030	0.006		W212162	RHW	03/22/12 10:51	
EPA 353.2	Nitrate/Nitrite as N	0.112	mg/L	0.050	0.009		W212178	RHW	03/23/12 11:14	
EPA 410.4	Chemical Oxygen Demand	25.5	mg/L	5.0	2.5		W211284	SM	03/16/12 09:59	
SM 2320B/2310B	Bicarbonate	8.5	mg/L	1.0	0.1		W211163	DKS	03/15/12 09:35	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.1		W211163	DKS	03/15/12 09:35	
SM 2320B/2310B	Total Alkalinity	8.5	mg/L	1.0	0.1		W211163	DKS	03/15/12 09:35	
SM 2540 C	Total Diss. Solids	70	mg/L	10			W211172	RS	03/14/12 17:35	H3
SM 2540 D	Total Susp. Solids	154	mg/L	5.0			W211170	RS	03/14/12 17:35	H3
SM 4500 H B	pH @20.0°C	6.52	pH Units				W211163	DKS	03/15/12 09:35	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W211256	IIT	03/15/12 13:56	
SM 4500-P-E	Phosphorus	0.021	mg/L	0.010	0.005		W211351	SM	03/19/12 15:12	
SM 5310B	Total Organic Carbon	7.78	mg/L	1.00	0.27		W211336	SM	03/19/12 21:54	



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

(208) 784-1258

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Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: **W2C0204**

Reported: 28-Mar-12 11:59

Client Sample ID: **05MAR2012SW012**

SVL Sample ID: **W2C0204-06 (Surface Water)**

Sample Report Page 3 of 3

Sampled: 05-Mar-12 09:32

Received: 12-Mar-12

Sampled By: FH

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	5.10	mg/L	0.20	0.07		W212103	AEW	03/20/12 14:48	
EPA 300.0	Fluoride	< 0.10	mg/L	0.10	0.02		W212103	AEW	03/20/12 14:48	
EPA 300.0	Sulfate as SO4	2.07	mg/L	0.30	0.04		W212103	AEW	03/20/12 14:48	

Cation/Anion Balance and TDS Ratios

Cation Sum: 0.43 meq/L Anion Sum: 0.37 meq/L C/A Balance: 7.67 % Calculated TDS: 31 TDS/cTDS: 2.26 TDS/eC: 1.60

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2C0204**
Reported: 28-Mar-12 11:59

Client Sample ID: **05MAR2012SW013**

SVL Sample ID: **W2C0204-07 (Surface Water)**

Sample Report Page 1 of 3

Sampled: 05-Mar-12 11:42
Received: 12-Mar-12
Sampled By: FH

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	0.00023	mg/L	0.00020	0.000072		W211268	DJA	03/19/12 11:59	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	51.2	mg/L	0.080	0.008		W211075	AS	03/27/12 12:14	
EPA 200.7	Barium	0.139	mg/L	0.0020	0.0002		W211075	AS	03/27/12 12:14	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0002		W211075	AS	03/27/12 12:14	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W211075	AS	03/27/12 12:14	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0002		W211075	AS	03/27/12 12:14	
EPA 200.7	Calcium	1.50	mg/L	0.040	0.006		W211075	AS	03/27/12 12:14	
EPA 200.7	Chromium	0.266	mg/L	0.0060	0.0003		W211075	AS	03/27/12 12:14	
EPA 200.7	Cobalt	0.0133	mg/L	0.0060	0.0005		W211075	AS	03/27/12 12:14	
EPA 200.7	Copper	0.219	mg/L	0.010	0.002		W211075	AS	03/27/12 12:14	
EPA 200.7	Iron	75.8	mg/L	0.060	0.008		W211075	AS	03/27/12 12:14	
EPA 200.7	Lead	0.0624	mg/L	0.0075	0.0017		W211075	AS	03/27/12 12:14	
EPA 200.7	Magnesium	2.11	mg/L	0.060	0.010		W211075	AS	03/27/12 12:14	
EPA 200.7	Manganese	0.365	mg/L	0.0040	0.0006		W211075	AS	03/27/12 12:14	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.0006		W211075	AS	03/27/12 12:14	
EPA 200.7	Nickel	0.073	mg/L	0.010	0.002		W211075	AS	03/27/12 12:14	
EPA 200.7	Potassium	1.90	mg/L	0.50	0.03		W211075	AS	03/27/12 12:14	
EPA 200.7	Silicon	36.3	mg/L	0.08	0.01		W211075	AS	03/27/12 12:14	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0003		W211075	AS	03/27/12 12:14	
EPA 200.7	Sodium	2.85	mg/L	0.50	0.02		W211075	AS	03/27/12 12:14	
EPA 200.7	Titanium	0.0216	mg/L	0.0050	0.0002		W211075	AS	03/27/12 12:14	
EPA 200.7	Vanadium	0.138	mg/L	0.0050	0.0002		W211075	AS	03/27/12 12:14	
EPA 200.7	Zinc	0.107	mg/L	0.0100	0.0010		W211075	AS	03/27/12 12:14	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W211129	KWH	03/21/12 12:26	
EPA 200.8	Arsenic	0.0041	mg/L	0.0038	0.0006	5	W211129	KWH	03/21/12 12:41	D5
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00055	5	W211129	KWH	03/21/12 12:41	D5
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000004	2.5	W211129	KWH	03/21/12 12:26	
EPA 200.8	Uranium	0.00437	mg/L	0.00100	0.000006	2.5	W211129	KWH	03/21/12 12:26	
SM 2340B	Hardness(as CaCO3)	12.4	mg/L	0.347	0.058		N/A		03/27/12 12:14	



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2C0204**
Reported: 28-Mar-12 11:59

Client Sample ID: **05MAR2012SW013**

SVL Sample ID: **W2C0204-07 (Surface Water)**

Sample Report Page 2 of 3

Sampled: 05-Mar-12 11:42
Received: 12-Mar-12
Sampled By: FH

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	0.097	mg/L	0.080	0.016		W211078	AS	03/27/12 14:17	
EPA 200.7	Barium	< 0.0020	mg/L	0.0020	0.0004		W211078	AS	03/27/12 14:17	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0004		W211078	AS	03/27/12 14:17	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W211078	AS	03/27/12 14:17	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W211078	AS	03/27/12 14:17	
EPA 200.7	Calcium	0.205	mg/L	0.040	0.012		W211078	AS	03/27/12 14:17	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W211078	AS	03/27/12 14:17	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W211078	AS	03/27/12 14:17	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.003		W211078	AS	03/27/12 14:17	
EPA 200.7	Iron	0.495	mg/L	0.060	0.017		W211078	AS	03/27/12 14:17	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0034		W211078	AS	03/27/12 14:17	
EPA 200.7	Magnesium	0.169	mg/L	0.060	0.021		W211078	AS	03/27/12 14:17	
EPA 200.7	Manganese	0.0335	mg/L	0.0040	0.0011		W211078	AS	03/27/12 14:17	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W211078	AS	03/27/12 14:17	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W211078	AS	03/27/12 14:17	
EPA 200.7	Potassium	0.53	mg/L	0.50	0.07		W211078	AS	03/27/12 14:17	
EPA 200.7	Silicon	2.93	mg/L	0.08	0.03		W211078	AS	03/27/12 14:17	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0005		W211078	AS	03/27/12 14:17	
EPA 200.7	Sodium	2.62	mg/L	0.50	0.04		W211078	AS	03/27/12 14:17	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W211078	AS	03/27/12 14:17	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W211078	AS	03/27/12 14:17	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0021		W211078	AS	03/27/12 14:17	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W211131	KWH	03/21/12 11:15	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W211131	KWH	03/21/12 11:15	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W211131	KWH	03/21/12 11:15	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000033		W211131	KWH	03/21/12 11:15	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000049		W211131	KWH	03/21/12 11:15	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W211167	STA	03/15/12 15:31	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0005		W211292	IIT	03/15/12 15:43	
EPA 120.1	Specific conductance	23.0	µmhos/cm	5.00			W211173	RS	03/14/12 11:50	
EPA 180.1	Turbidity	6340	NTU	20.0		200	W211135	SM	03/13/12 14:23	D2,H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W211255	IIT	03/15/12 12:50	
EPA 350.1	Ammonia as N	0.780	mg/L	0.030	0.006		W212162	RHW	03/22/12 10:53	
EPA 353.2	Nitrate/Nitrite as N	0.076	mg/L	0.050	0.009		W212178	RHW	03/23/12 11:15	
EPA 410.4	Chemical Oxygen Demand	70.2	mg/L	5.0	2.5		W211284	SM	03/16/12 09:59	
SM 2320B/2310B	Bicarbonate	1.9	mg/L	1.0	0.1		W211163	DKS	03/15/12 09:41	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.1		W211163	DKS	03/15/12 09:41	
SM 2320B/2310B	Total Alkalinity	1.9	mg/L	1.0	0.1		W211163	DKS	03/15/12 09:41	
SM 2540 C	Total Diss. Solids	184	mg/L	40			W211172	RS	03/14/12 17:35	H3,N3
SM 2540 D	Total Susp. Solids	5910	mg/L	20.0			W211170	RS	03/14/12 17:35	H3
SM 4500 H B	pH @20.0°C	5.61	pH Units				W211163	DKS	03/15/12 09:41	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W211256	IIT	03/15/12 13:58	
SM 4500-P-E	Phosphorus	0.818	mg/L	0.010	0.005		W211351	SM	03/19/12 15:12	
SM 5310B	Total Organic Carbon	14.4	mg/L	1.00	0.27		W211336	SM	03/19/12 22:07	



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

(208) 784-1258

Fax (208) 783-0891

Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: **W2C0204**

Reported: 28-Mar-12 11:59

Client Sample ID: **05MAR2012SW013**

SVL Sample ID: **W2C0204-07 (Surface Water)**

Sample Report Page 3 of 3

Sampled: 05-Mar-12 11:42

Received: 12-Mar-12

Sampled By: FH

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	3.92	mg/L	0.20	0.07		W212103	AEW	03/20/12 15:23	
EPA 300.0	Fluoride	< 0.10	mg/L	0.10	0.02		W212103	AEW	03/20/12 15:23	
EPA 300.0	Sulfate as SO4	1.81	mg/L	0.30	0.04		W212103	AEW	03/20/12 15:23	

Cation/Anion Balance and TDS Ratios

Cation Sum: 0.24 meq/L Anion Sum: 0.19 meq/L C/A Balance: 10.32 % Calculated TDS: 66 TDS/cTDS: 2.78 TDS/eC: 8.00

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2C0204**
Reported: 28-Mar-12 11:59

Client Sample ID: **05MAR2012SW113**

SVL Sample ID: **W2C0204-08 (Surface Water)**

Sample Report Page 1 of 3

Sampled: 05-Mar-12 11:45
Received: 12-Mar-12
Sampled By: FH

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W211268	DJA	03/19/12 12:00	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	50.2	mg/L	0.080	0.008		W211075	AS	03/27/12 12:19	
EPA 200.7	Barium	0.137	mg/L	0.0020	0.0002		W211075	AS	03/27/12 12:19	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0002		W211075	AS	03/27/12 12:19	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W211075	AS	03/27/12 12:19	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0002		W211075	AS	03/27/12 12:19	
EPA 200.7	Calcium	1.50	mg/L	0.040	0.006		W211075	AS	03/27/12 12:19	
EPA 200.7	Chromium	0.252	mg/L	0.0060	0.0003		W211075	AS	03/27/12 12:19	
EPA 200.7	Cobalt	0.0127	mg/L	0.0060	0.0005		W211075	AS	03/27/12 12:19	
EPA 200.7	Copper	0.211	mg/L	0.010	0.002		W211075	AS	03/27/12 12:19	
EPA 200.7	Iron	71.5	mg/L	0.060	0.008		W211075	AS	03/27/12 12:19	
EPA 200.7	Lead	0.0596	mg/L	0.0075	0.0017		W211075	AS	03/27/12 12:19	
EPA 200.7	Magnesium	2.04	mg/L	0.060	0.010		W211075	AS	03/27/12 12:19	
EPA 200.7	Manganese	0.358	mg/L	0.0040	0.0006		W211075	AS	03/27/12 12:19	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.0006		W211075	AS	03/27/12 12:19	
EPA 200.7	Nickel	0.068	mg/L	0.010	0.002		W211075	AS	03/27/12 12:19	
EPA 200.7	Potassium	1.88	mg/L	0.50	0.03		W211075	AS	03/27/12 12:19	
EPA 200.7	Silicon	35.5	mg/L	0.08	0.01		W211075	AS	03/27/12 12:19	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0003		W211075	AS	03/27/12 12:19	
EPA 200.7	Sodium	2.89	mg/L	0.50	0.02		W211075	AS	03/27/12 12:19	
EPA 200.7	Titanium	0.0201	mg/L	0.0050	0.0002		W211075	AS	03/27/12 12:19	
EPA 200.7	Vanadium	0.133	mg/L	0.0050	0.0002		W211075	AS	03/27/12 12:19	
EPA 200.7	Zinc	0.103	mg/L	0.0100	0.0010		W211075	AS	03/27/12 12:19	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W211129	KWH	03/21/12 12:28	
EPA 200.8	Arsenic	0.0041	mg/L	0.0038	0.0006	5	W211129	KWH	03/21/12 12:42	D5
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00055	5	W211129	KWH	03/21/12 12:42	D5
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000004	2.5	W211129	KWH	03/21/12 12:28	
EPA 200.8	Uranium	0.00402	mg/L	0.00100	0.000006	2.5	W211129	KWH	03/21/12 12:28	
SM 2340B	Hardness(as CaCO3)	12.2	mg/L	0.347	0.058		N/A		03/27/12 12:19	



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2C0204**
Reported: 28-Mar-12 11:59

Client Sample ID: **05MAR2012SW113**

SVL Sample ID: **W2C0204-08 (Surface Water)**

Sample Report Page 2 of 3

Sampled: 05-Mar-12 11:45
Received: 12-Mar-12
Sampled By: FH

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	0.083	mg/L	0.080	0.016		W211078	AS	03/27/12 14:22	
EPA 200.7	Barium	< 0.0020	mg/L	0.0020	0.0004		W211078	AS	03/27/12 14:22	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0004		W211078	AS	03/27/12 14:22	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W211078	AS	03/27/12 14:22	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W211078	AS	03/27/12 14:22	
EPA 200.7	Calcium	0.178	mg/L	0.040	0.012		W211078	AS	03/27/12 14:22	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W211078	AS	03/27/12 14:22	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W211078	AS	03/27/12 14:22	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.003		W211078	AS	03/27/12 14:22	
EPA 200.7	Iron	0.360	mg/L	0.060	0.017		W211078	AS	03/27/12 14:22	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0034		W211078	AS	03/27/12 14:22	
EPA 200.7	Magnesium	0.125	mg/L	0.060	0.021		W211078	AS	03/27/12 14:22	
EPA 200.7	Manganese	0.0302	mg/L	0.0040	0.0011		W211078	AS	03/27/12 14:22	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W211078	AS	03/27/12 14:22	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W211078	AS	03/27/12 14:22	
EPA 200.7	Potassium	0.52	mg/L	0.50	0.07		W211078	AS	03/27/12 14:22	
EPA 200.7	Silicon	2.86	mg/L	0.08	0.03		W211078	AS	03/27/12 14:22	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0005		W211078	AS	03/27/12 14:22	
EPA 200.7	Sodium	2.58	mg/L	0.50	0.04		W211078	AS	03/27/12 14:22	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W211078	AS	03/27/12 14:22	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W211078	AS	03/27/12 14:22	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0021		W211078	AS	03/27/12 14:22	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W211131	KWH	03/21/12 11:16	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W211131	KWH	03/21/12 11:16	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W211131	KWH	03/21/12 11:16	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000033		W211131	KWH	03/21/12 11:16	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000049		W211131	KWH	03/21/12 11:16	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W211167	STA	03/15/12 15:32	
Classical Chemistry Parameters										
ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0005		W211292	IIT	03/15/12 15:45	
EPA 120.1	Specific conductance	24.1	µmhos/cm	5.00			W211173	RS	03/14/12 11:50	
EPA 180.1	Turbidity	5820	NTU	20.0		200	W211135	SM	03/13/12 14:23	D2,H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W211255	IIT	03/15/12 12:52	
EPA 350.1	Ammonia as N	0.652	mg/L	0.030	0.006		W212162	RHW	03/22/12 10:54	
EPA 353.2	Nitrate/Nitrite as N	0.078	mg/L	0.050	0.009		W212178	RHW	03/23/12 11:22	
EPA 410.4	Chemical Oxygen Demand	64.4	mg/L	5.0	2.5		W211284	SM	03/16/12 09:59	
SM 2320B/2310B	Bicarbonate	1.8	mg/L	1.0	0.1		W211163	DKS	03/15/12 09:44	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.1		W211163	DKS	03/15/12 09:44	
SM 2320B/2310B	Total Alkalinity	1.8	mg/L	1.0	0.1		W211163	DKS	03/15/12 09:44	
SM 2540 C	Total Diss. Solids	120	mg/L	40			W211172	RS	03/14/12 17:35	H3,N3
SM 2540 D	Total Susp. Solids	5780	mg/L	20.0			W211170	RS	03/14/12 17:35	H3
SM 4500 H B	pH @21.0°C	5.60	pH Units				W211163	DKS	03/15/12 09:44	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W211256	IIT	03/15/12 14:00	
SM 4500-P-E	Phosphorus	0.788	mg/L	0.010	0.005		W211351	SM	03/19/12 15:12	
SM 5310B	Total Organic Carbon	16.4	mg/L	1.00	0.27		W211336	SM	03/19/12 22:20	



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Kellogg ID 83837-0929

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Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: **W2C0204**

Reported: 28-Mar-12 11:59

Client Sample ID: **05MAR2012SW113**

SVL Sample ID: **W2C0204-08 (Surface Water)**

Sample Report Page 3 of 3

Sampled: 05-Mar-12 11:45

Received: 12-Mar-12

Sampled By: FH

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	3.87	mg/L	0.20	0.07		W212103	AEW	03/20/12 15:34	
EPA 300.0	Fluoride	< 0.10	mg/L	0.10	0.02		W212103	AEW	03/20/12 15:34	
EPA 300.0	Sulfate as SO4	1.83	mg/L	0.30	0.04		W212103	AEW	03/20/12 15:34	

Cation/Anion Balance and TDS Ratios

Cation Sum: 0.21 meq/L Anion Sum: 0.19 meq/L C/A Balance: 6.08 % Calculated TDS: 65 TDS/cTDS: 1.85 TDS/eC: 4.98

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2C0204**
Reported: 28-Mar-12 11:59

Client Sample ID: **05MAR2012SW014**

SVL Sample ID: **W2C0204-09 (Surface Water)**

Sample Report Page 1 of 3

Sampled: 05-Mar-12 14:09
Received: 12-Mar-12
Sampled By: FH

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W211268	DJA	03/19/12 12:02	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	0.952	mg/L	0.080	0.008		W211075	AS	03/27/12 12:24	
EPA 200.7	Barium	0.0104	mg/L	0.0020	0.0002		W211075	AS	03/27/12 12:24	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0002		W211075	AS	03/27/12 12:24	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W211075	AS	03/27/12 12:24	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0002		W211075	AS	03/27/12 12:24	
EPA 200.7	Calcium	0.829	mg/L	0.040	0.006		W211075	AS	03/27/12 12:24	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0003		W211075	AS	03/27/12 12:24	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W211075	AS	03/27/12 12:24	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.002		W211075	AS	03/27/12 12:24	
EPA 200.7	Iron	5.91	mg/L	0.060	0.008		W211075	AS	03/27/12 12:24	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0017		W211075	AS	03/27/12 12:24	
EPA 200.7	Magnesium	1.20	mg/L	0.060	0.010		W211075	AS	03/27/12 12:24	
EPA 200.7	Manganese	0.0626	mg/L	0.0040	0.0006		W211075	AS	03/27/12 12:24	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.0006		W211075	AS	03/27/12 12:24	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W211075	AS	03/27/12 12:24	
EPA 200.7	Potassium	0.70	mg/L	0.50	0.03		W211075	AS	03/27/12 12:24	
EPA 200.7	Silicon	4.73	mg/L	0.08	0.01		W211075	AS	03/27/12 12:24	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0003		W211075	AS	03/27/12 12:24	
EPA 200.7	Sodium	3.56	mg/L	0.50	0.02		W211075	AS	03/27/12 12:24	
EPA 200.7	Titanium	0.0097	mg/L	0.0050	0.0002		W211075	AS	03/27/12 12:24	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0002		W211075	AS	03/27/12 12:24	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0010		W211075	AS	03/27/12 12:24	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W211129	KWH	03/21/12 12:29	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W211129	KWH	03/21/12 12:29	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W211129	KWH	03/21/12 12:29	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000004	2.5	W211129	KWH	03/21/12 12:29	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000006	2.5	W211129	KWH	03/21/12 12:29	
SM 2340B	Hardness(as CaCO3)	7.00	mg/L	0.347	0.058		N/A		03/27/12 12:24	



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2C0204**
Reported: 28-Mar-12 11:59

Client Sample ID: **05MAR2012SW014**

SVL Sample ID: **W2C0204-09 (Surface Water)**

Sample Report Page 2 of 3

Sampled: 05-Mar-12 14:09
Received: 12-Mar-12
Sampled By: FH

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.016		W211078	AS	03/27/12 14:28	
EPA 200.7	Barium	0.0064	mg/L	0.0020	0.0004		W211078	AS	03/27/12 14:28	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0004		W211078	AS	03/27/12 14:28	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W211078	AS	03/27/12 14:28	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W211078	AS	03/27/12 14:28	
EPA 200.7	Calcium	0.775	mg/L	0.040	0.012		W211078	AS	03/27/12 14:28	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W211078	AS	03/27/12 14:28	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W211078	AS	03/27/12 14:28	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.003		W211078	AS	03/27/12 14:28	
EPA 200.7	Iron	0.732	mg/L	0.060	0.017		W211078	AS	03/27/12 14:28	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0034		W211078	AS	03/27/12 14:28	
EPA 200.7	Magnesium	1.09	mg/L	0.060	0.021		W211078	AS	03/27/12 14:28	
EPA 200.7	Manganese	0.0530	mg/L	0.0040	0.0011		W211078	AS	03/27/12 14:28	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W211078	AS	03/27/12 14:28	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W211078	AS	03/27/12 14:28	
EPA 200.7	Potassium	0.63	mg/L	0.50	0.07		W211078	AS	03/27/12 14:28	
EPA 200.7	Silicon	4.19	mg/L	0.08	0.03		W211078	AS	03/27/12 14:28	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0005		W211078	AS	03/27/12 14:28	
EPA 200.7	Sodium	3.45	mg/L	0.50	0.04		W211078	AS	03/27/12 14:28	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W211078	AS	03/27/12 14:28	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W211078	AS	03/27/12 14:28	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0021		W211078	AS	03/27/12 14:28	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W211131	KWH	03/21/12 11:18	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W211131	KWH	03/21/12 11:18	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W211131	KWH	03/21/12 11:18	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000033		W211131	KWH	03/21/12 11:18	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000049		W211131	KWH	03/21/12 11:18	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W211167	STA	03/15/12 15:35	
Classical Chemistry Parameters										
ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0005		W211292	IIT	03/15/12 15:47	
EPA 120.1	Specific conductance	34.0	µmhos/cm	5.00			W211173	RS	03/14/12 11:50	
EPA 180.1	Turbidity	119	NTU	0.400		4	W211135	SM	03/13/12 14:23	D2,H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W211255	IIT	03/15/12 12:54	
EPA 350.1	Ammonia as N	0.242	mg/L	0.030	0.006		W212162	RHW	03/22/12 11:01	
EPA 353.2	Nitrate/Nitrite as N	0.109	mg/L	0.050	0.009		W212178	RHW	03/23/12 11:24	
EPA 410.4	Chemical Oxygen Demand	22.6	mg/L	5.0	2.5		W211284	SM	03/16/12 09:59	
SM 2320B/2310B	Bicarbonate	5.3	mg/L	1.0	0.1		W211163	DKS	03/15/12 09:47	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.1		W211163	DKS	03/15/12 09:47	
SM 2320B/2310B	Total Alkalinity	5.3	mg/L	1.0	0.1		W211163	DKS	03/15/12 09:47	
SM 2540 C	Total Diss. Solids	54	mg/L	10			W211172	RS	03/14/12 17:35	H3
SM 2540 D	Total Susp. Solids	77.0	mg/L	5.0			W211170	RS	03/14/12 17:35	H3
SM 4500 H B	pH @24.0°C	6.48	pH Units				W211163	DKS	03/15/12 09:47	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W211256	IIT	03/15/12 14:02	
SM 4500-P-E	Phosphorus	0.020	mg/L	0.010	0.005		W211351	SM	03/19/12 15:12	
SM 5310B	Total Organic Carbon	8.10	mg/L	1.00	0.27		W211336	SM	03/19/12 22:37	



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Kellogg ID 83837-0929

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Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: **W2C0204**

Reported: 28-Mar-12 11:59

Client Sample ID: **05MAR2012SW014**

SVL Sample ID: **W2C0204-09 (Surface Water)**

Sample Report Page 3 of 3

Sampled: 05-Mar-12 14:09

Received: 12-Mar-12

Sampled By: FH

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	5.23	mg/L	0.20	0.07		W212103	AEW	03/20/12 15:45	
EPA 300.0	Fluoride	< 0.10	mg/L	0.10	0.02		W212103	AEW	03/20/12 15:45	
EPA 300.0	Sulfate as SO4	0.72	mg/L	0.30	0.04		W212103	AEW	03/20/12 15:45	

Cation/Anion Balance and TDS Ratios

Cation Sum: 0.34 meq/L Anion Sum: 0.28 meq/L C/A Balance: 10.41 % Calculated TDS: 28 TDS/cTDS: 1.94 TDS/eC: 1.59

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2C0204**
Reported: 28-Mar-12 11:59

Client Sample ID: **05MAR2012SW201**

SVL Sample ID: **W2C0204-10 (Surface Water)**

Sample Report Page 1 of 3

Sampled: 05-Mar-12 16:00
Received: 12-Mar-12
Sampled By: FH

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W211268	DJA	03/19/12 12:04	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.008		W211075	AS	03/27/12 12:29	
EPA 200.7	Barium	< 0.0020	mg/L	0.0020	0.0002		W211075	AS	03/27/12 12:29	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0002		W211075	AS	03/27/12 12:29	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W211075	AS	03/27/12 12:29	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0002		W211075	AS	03/27/12 12:29	
EPA 200.7	Calcium	< 0.040	mg/L	0.040	0.006		W211075	AS	03/27/12 12:29	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0003		W211075	AS	03/27/12 12:29	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W211075	AS	03/27/12 12:29	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.002		W211075	AS	03/27/12 12:29	
EPA 200.7	Iron	< 0.060	mg/L	0.060	0.008		W211075	AS	03/27/12 12:29	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0017		W211075	AS	03/27/12 12:29	
EPA 200.7	Magnesium	< 0.060	mg/L	0.060	0.010		W211075	AS	03/27/12 12:29	
EPA 200.7	Manganese	< 0.0040	mg/L	0.0040	0.0006		W211075	AS	03/27/12 12:29	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.0006		W211075	AS	03/27/12 12:29	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W211075	AS	03/27/12 12:29	
EPA 200.7	Potassium	< 0.50	mg/L	0.50	0.03		W211075	AS	03/27/12 12:29	
EPA 200.7	Silicon	< 0.08	mg/L	0.08	0.01		W211075	AS	03/27/12 12:29	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0003		W211075	AS	03/27/12 12:29	
EPA 200.7	Sodium	0.74	mg/L	0.50	0.02		W211075	AS	03/27/12 12:29	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0002		W211075	AS	03/27/12 12:29	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0002		W211075	AS	03/27/12 12:29	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0010		W211075	AS	03/27/12 12:29	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W211129	KWH	03/21/12 12:31	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W211129	KWH	03/21/12 12:31	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W211129	KWH	03/21/12 12:31	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000004	2.5	W211129	KWH	03/21/12 12:31	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000006	2.5	W211129	KWH	03/21/12 12:31	
SM 2340B	Hardness(as CaCO3)	< 0.347	mg/L	0.347	0.058		N/A		03/27/12 12:29	



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: **Suriname Merian 2012 / 113-93245**

Work Order: **W2C0204**

Reported: 28-Mar-12 11:59

Client Sample ID: **05MAR2012SW201**

Sampled: 05-Mar-12 16:00

SVL Sample ID: **W2C0204-10 (Surface Water)**

Received: 12-Mar-12

Sample Report Page 2 of 3

Sampled By: FH

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.016		W211078	AS	03/27/12 14:33	
EPA 200.7	Barium	< 0.0020	mg/L	0.0020	0.0004		W211078	AS	03/27/12 14:33	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0004		W211078	AS	03/27/12 14:33	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W211078	AS	03/27/12 14:33	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W211078	AS	03/27/12 14:33	
EPA 200.7	Calcium	< 0.040	mg/L	0.040	0.012		W211078	AS	03/27/12 14:33	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W211078	AS	03/27/12 14:33	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W211078	AS	03/27/12 14:33	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.003		W211078	AS	03/27/12 14:33	
EPA 200.7	Iron	< 0.060	mg/L	0.060	0.017		W211078	AS	03/27/12 14:33	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0034		W211078	AS	03/27/12 14:33	
EPA 200.7	Magnesium	< 0.060	mg/L	0.060	0.021		W211078	AS	03/27/12 14:33	
EPA 200.7	Manganese	< 0.0040	mg/L	0.0040	0.0011		W211078	AS	03/27/12 14:33	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W211078	AS	03/27/12 14:33	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W211078	AS	03/27/12 14:33	
EPA 200.7	Potassium	< 0.50	mg/L	0.50	0.07		W211078	AS	03/27/12 14:33	
EPA 200.7	Silicon	0.08	mg/L	0.08	0.03		W211078	AS	03/27/12 14:33	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0005		W211078	AS	03/27/12 14:33	
EPA 200.7	Sodium	< 0.50	mg/L	0.50	0.04		W211078	AS	03/27/12 14:33	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W211078	AS	03/27/12 14:33	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W211078	AS	03/27/12 14:33	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0021		W211078	AS	03/27/12 14:33	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W211131	KWH	03/21/12 11:20	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W211131	KWH	03/21/12 11:20	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W211131	KWH	03/21/12 11:20	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000033		W211131	KWH	03/21/12 11:20	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000049		W211131	KWH	03/21/12 11:20	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W211167	STA	03/15/12 15:40	
Classical Chemistry Parameters										
ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0005		W211292	IIT	03/15/12 15:49	
EPA 120.1	Specific conductance	7.60	µmhos/cm	5.00			W211173	RS	03/14/12 11:50	
EPA 180.1	Turbidity	0.454	NTU	0.100			W211135	SM	03/13/12 14:23	H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W211255	IIT	03/15/12 13:02	
EPA 350.1	Ammonia as N	< 0.030	mg/L	0.030	0.006		W212254	RHW	03/26/12 11:29	
EPA 353.2	Nitrate/Nitrite as N	0.110	mg/L	0.050	0.009		W212178	RHW	03/23/12 11:25	
EPA 410.4	Chemical Oxygen Demand	< 5.0	mg/L	5.0	2.5		W211284	SM	03/16/12 09:59	
SM 2320B/2310B	Bicarbonate	< 1.0	mg/L	1.0	0.1		W211163	DKS	03/15/12 09:52	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.1		W211163	DKS	03/15/12 09:52	
SM 2320B/2310B	Total Alkalinity	< 1.0	mg/L	1.0	0.1		W211163	DKS	03/15/12 09:52	
SM 2540 C	Total Diss. Solids	< 10	mg/L	10			W211172	RS	03/14/12 17:35	H3
SM 2540 D	Total Susp. Solids	5.0	mg/L	5.0			W211170	RS	03/14/12 17:35	H3
SM 4500 H B	pH @23.0°C	4.90	pH Units				W211163	DKS	03/15/12 09:52	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W211256	IIT	03/15/12 14:04	
SM 4500-P-E	Phosphorus	< 0.010	mg/L	0.010	0.005		W211351	SM	03/19/12 15:12	
SM 5310B	Total Organic Carbon	< 1.00	mg/L	1.00	0.27		W211336	SM	03/19/12 22:48	



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Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: **W2C0204**

Reported: 28-Mar-12 11:59

Client Sample ID: **05MAR2012SW201**

SVL Sample ID: **W2C0204-10 (Surface Water)**

Sample Report Page 3 of 3

Sampled: 05-Mar-12 16:00

Received: 12-Mar-12

Sampled By: FH

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	0.54	mg/L	0.20	0.07		W212103	AEW	03/20/12 15:57	
EPA 300.0	Fluoride	< 0.10	mg/L	0.10	0.02		W212103	AEW	03/20/12 15:57	
EPA 300.0	Sulfate as SO4	0.75	mg/L	0.30	0.04		W212103	AEW	03/20/12 15:57	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2C0204**
Reported: 28-Mar-12 11:59

Client Sample ID: **05MAR2012SW015**

SVL Sample ID: **W2C0204-11 (Surface Water)**

Sample Report Page 1 of 3

Sampled: 05-Mar-12 16:50
Received: 12-Mar-12
Sampled By: FH

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W211268	DJA	03/19/12 12:05	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	8.02	mg/L	0.080	0.008		W211075	AS	03/27/12 12:35	
EPA 200.7	Barium	0.0250	mg/L	0.0020	0.0002		W211075	AS	03/27/12 12:35	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0002		W211075	AS	03/27/12 12:35	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W211075	AS	03/27/12 12:35	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0002		W211075	AS	03/27/12 12:35	
EPA 200.7	Calcium	0.987	mg/L	0.040	0.006		W211075	AS	03/27/12 12:35	
EPA 200.7	Chromium	0.0276	mg/L	0.0060	0.0003		W211075	AS	03/27/12 12:35	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W211075	AS	03/27/12 12:35	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.002		W211075	AS	03/27/12 12:35	
EPA 200.7	Iron	14.3	mg/L	0.060	0.008		W211075	AS	03/27/12 12:35	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0017		W211075	AS	03/27/12 12:35	
EPA 200.7	Magnesium	1.83	mg/L	0.060	0.010		W211075	AS	03/27/12 12:35	
EPA 200.7	Manganese	0.118	mg/L	0.0040	0.0006		W211075	AS	03/27/12 12:35	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.0006		W211075	AS	03/27/12 12:35	
EPA 200.7	Nickel	0.011	mg/L	0.010	0.002		W211075	AS	03/27/12 12:35	
EPA 200.7	Potassium	0.77	mg/L	0.50	0.03		W211075	AS	03/27/12 12:35	
EPA 200.7	Silicon	10.9	mg/L	0.08	0.01		W211075	AS	03/27/12 12:35	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0003		W211075	AS	03/27/12 12:35	
EPA 200.7	Sodium	3.38	mg/L	0.50	0.02		W211075	AS	03/27/12 12:35	
EPA 200.7	Titanium	0.0241	mg/L	0.0050	0.0002		W211075	AS	03/27/12 12:35	
EPA 200.7	Vanadium	0.0147	mg/L	0.0050	0.0002		W211075	AS	03/27/12 12:35	
EPA 200.7	Zinc	0.0160	mg/L	0.0100	0.0010		W211075	AS	03/27/12 12:35	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W211129	KWH	03/21/12 12:33	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W211129	KWH	03/21/12 12:33	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W211129	KWH	03/21/12 12:33	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000004	2.5	W211129	KWH	03/21/12 12:33	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000006	2.5	W211129	KWH	03/21/12 12:33	
SM 2340B	Hardness(as CaCO3)	10.0	mg/L	0.347	0.058		N/A		03/27/12 12:35	



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: **W2C0204**

Reported: 28-Mar-12 11:59

Client Sample ID: **05MAR2012SW015**

SVL Sample ID: **W2C0204-11 (Surface Water)**

Sample Report Page 2 of 3

Sampled: 05-Mar-12 16:50

Received: 12-Mar-12

Sampled By: FH

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.016		W211078	AS	03/27/12 14:38	
EPA 200.7	Barium	0.0044	mg/L	0.0020	0.0004		W211078	AS	03/27/12 14:38	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0004		W211078	AS	03/27/12 14:38	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W211078	AS	03/27/12 14:38	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W211078	AS	03/27/12 14:38	
EPA 200.7	Calcium	0.749	mg/L	0.040	0.012		W211078	AS	03/27/12 14:38	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W211078	AS	03/27/12 14:38	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W211078	AS	03/27/12 14:38	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.003		W211078	AS	03/27/12 14:38	
EPA 200.7	Iron	0.768	mg/L	0.060	0.017		W211078	AS	03/27/12 14:38	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0034		W211078	AS	03/27/12 14:38	
EPA 200.7	Magnesium	1.05	mg/L	0.060	0.021		W211078	AS	03/27/12 14:38	
EPA 200.7	Manganese	0.0599	mg/L	0.0040	0.0011		W211078	AS	03/27/12 14:38	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W211078	AS	03/27/12 14:38	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W211078	AS	03/27/12 14:38	
EPA 200.7	Potassium	0.63	mg/L	0.50	0.07		W211078	AS	03/27/12 14:38	
EPA 200.7	Silicon	3.90	mg/L	0.08	0.03		W211078	AS	03/27/12 14:38	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0005		W211078	AS	03/27/12 14:38	
EPA 200.7	Sodium	3.28	mg/L	0.50	0.04		W211078	AS	03/27/12 14:38	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W211078	AS	03/27/12 14:38	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W211078	AS	03/27/12 14:38	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0021		W211078	AS	03/27/12 14:38	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W211131	KWH	03/21/12 11:21	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W211131	KWH	03/21/12 11:21	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W211131	KWH	03/21/12 11:21	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000033		W211131	KWH	03/21/12 11:21	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000049		W211131	KWH	03/21/12 11:21	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W211167	STA	03/15/12 15:43	
Classical Chemistry Parameters										
ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0005		W211292	IIT	03/15/12 15:51	
EPA 120.1	Specific conductance	32.7	µmhos/cm	5.00			W211173	RS	03/14/12 11:50	
EPA 180.1	Turbidity	534	NTU	2.00		20	W211135	SM	03/13/12 14:23	D2,H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W211255	IIT	03/15/12 13:04	
EPA 350.1	Ammonia as N	0.281	mg/L	0.030	0.006		W212162	RHW	03/22/12 11:02	
EPA 353.2	Nitrate/Nitrite as N	0.138	mg/L	0.050	0.009		W212178	RHW	03/23/12 11:52	
EPA 410.4	Chemical Oxygen Demand	26.0	mg/L	5.0	2.5		W211284	SM	03/16/12 09:59	
SM 2320B/2310B	Bicarbonate	5.2	mg/L	1.0	0.1		W211163	DKS	03/15/12 09:54	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.1		W211163	DKS	03/15/12 09:54	
SM 2320B/2310B	Total Alkalinity	5.2	mg/L	1.0	0.1		W211163	DKS	03/15/12 09:54	
SM 2540 C	Total Diss. Solids	50	mg/L	10			W211172	RS	03/14/12 17:35	H3
SM 2540 D	Total Susp. Solids	387	mg/L	5.0			W211170	RS	03/14/12 17:35	H3
SM 4500 H B	pH @26.0°C	6.43	pH Units				W211163	DKS	03/15/12 09:54	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W211256	IIT	03/15/12 14:06	
SM 4500-P-E	Phosphorus	0.162	mg/L	0.010	0.005		W211351	SM	03/19/12 15:12	
SM 5310B	Total Organic Carbon	7.82	mg/L	1.00	0.27		W211288	SM	03/19/12 19:18	



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Kellogg ID 83837-0929

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Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: **W2C0204**

Reported: 28-Mar-12 11:59

Client Sample ID: **05MAR2012SW015**

SVL Sample ID: **W2C0204-11 (Surface Water)**

Sample Report Page 3 of 3

Sampled: 05-Mar-12 16:50

Received: 12-Mar-12

Sampled By: FH

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	4.79	mg/L	0.20	0.07		W212103	AEW	03/20/12 16:20	
EPA 300.0	Fluoride	< 0.10	mg/L	0.10	0.02		W212103	AEW	03/20/12 16:20	
EPA 300.0	Sulfate as SO4	0.75	mg/L	0.30	0.04		W212103	AEW	03/20/12 16:20	

Cation/Anion Balance and TDS Ratios

Cation Sum: 0.33 meq/L Anion Sum: 0.27 meq/L C/A Balance: 11.43 % Calculated TDS: 36 TDS/cTDS: 1.40 TDS/eC: 1.53

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2C0204**
Reported: 28-Mar-12 11:59

Client Sample ID: **03MAR2012SW005**

SVL Sample ID: **W2C0204-12 (Surface Water)**

Sample Report Page 1 of 3

Sampled: 03-Mar-12 10:15
Received: 12-Mar-12
Sampled By: FH

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W211268	DJA	03/19/12 12:10	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	0.847	mg/L	0.080	0.008		W211075	AS	03/27/12 12:45	
EPA 200.7	Barium	0.0137	mg/L	0.0020	0.0002		W211075	AS	03/27/12 12:45	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0002		W211075	AS	03/27/12 12:45	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W211075	AS	03/27/12 12:45	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0002		W211075	AS	03/27/12 12:45	
EPA 200.7	Calcium	1.47	mg/L	0.040	0.006		W211075	AS	03/27/12 12:45	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0003		W211075	AS	03/27/12 12:45	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W211075	AS	03/27/12 12:45	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.002		W211075	AS	03/27/12 12:45	
EPA 200.7	Iron	10.2	mg/L	0.060	0.008		W211075	AS	03/27/12 12:45	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0017		W211075	AS	03/27/12 12:45	
EPA 200.7	Magnesium	1.21	mg/L	0.060	0.010		W211075	AS	03/27/12 12:45	
EPA 200.7	Manganese	0.179	mg/L	0.0040	0.0006		W211075	AS	03/27/12 12:45	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.0006		W211075	AS	03/27/12 12:45	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W211075	AS	03/27/12 12:45	
EPA 200.7	Potassium	1.32	mg/L	0.50	0.03		W211075	AS	03/27/12 12:45	
EPA 200.7	Silicon	3.42	mg/L	0.08	0.01		W211075	AS	03/27/12 12:45	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0003		W211075	AS	03/27/12 12:45	
EPA 200.7	Sodium	3.33	mg/L	0.50	0.02		W211075	AS	03/27/12 12:45	
EPA 200.7	Titanium	0.0131	mg/L	0.0050	0.0002		W211075	AS	03/27/12 12:45	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0002		W211075	AS	03/27/12 12:45	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0010		W211075	AS	03/27/12 12:45	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W211129	KWH	03/21/12 12:39	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W211129	KWH	03/21/12 12:39	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W211129	KWH	03/21/12 12:39	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000004	2.5	W211129	KWH	03/21/12 12:39	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000006	2.5	W211129	KWH	03/21/12 12:39	
SM 2340B	Hardness(as CaCO3)	8.67	mg/L	0.347	0.058		N/A		03/27/12 12:45	



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2C0204**
Reported: 28-Mar-12 11:59

Client Sample ID: **03MAR2012SW005**

SVL Sample ID: **W2C0204-12 (Surface Water)**

Sample Report Page 2 of 3

Sampled: 03-Mar-12 10:15
Received: 12-Mar-12
Sampled By: FH

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.016		W211078	AS	03/27/12 14:49	
EPA 200.7	Barium	0.0110	mg/L	0.0020	0.0004		W211078	AS	03/27/12 14:49	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0004		W211078	AS	03/27/12 14:49	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W211078	AS	03/27/12 14:49	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W211078	AS	03/27/12 14:49	
EPA 200.7	Calcium	1.41	mg/L	0.040	0.012		W211078	AS	03/27/12 14:49	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W211078	AS	03/27/12 14:49	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W211078	AS	03/27/12 14:49	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.003		W211078	AS	03/27/12 14:49	
EPA 200.7	Iron	2.69	mg/L	0.060	0.017		W211078	AS	03/27/12 14:49	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0034		W211078	AS	03/27/12 14:49	
EPA 200.7	Magnesium	1.12	mg/L	0.060	0.021		W211078	AS	03/27/12 14:49	
EPA 200.7	Manganese	0.165	mg/L	0.0040	0.0011		W211078	AS	03/27/12 14:49	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W211078	AS	03/27/12 14:49	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W211078	AS	03/27/12 14:49	
EPA 200.7	Potassium	1.24	mg/L	0.50	0.07		W211078	AS	03/27/12 14:49	
EPA 200.7	Silicon	2.87	mg/L	0.08	0.03		W211078	AS	03/27/12 14:49	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0005		W211078	AS	03/27/12 14:49	
EPA 200.7	Sodium	3.22	mg/L	0.50	0.04		W211078	AS	03/27/12 14:49	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W211078	AS	03/27/12 14:49	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W211078	AS	03/27/12 14:49	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0021		W211078	AS	03/27/12 14:49	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W211131	KWH	03/21/12 11:23	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W211131	KWH	03/21/12 11:23	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W211131	KWH	03/21/12 11:23	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000033		W211131	KWH	03/21/12 11:23	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000049		W211131	KWH	03/21/12 11:23	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W211167	STA	03/15/12 15:45	
Classical Chemistry Parameters										
ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0005		W211292	IIT	03/15/12 15:53	
EPA 120.1	Specific conductance	48.4	µmhos/cm	5.00			W211173	RS	03/14/12 11:50	
EPA 180.1	Turbidity	112	NTU	5.00		5	W211135	SM	03/13/12 14:23	D2,H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W211255	IIT	03/15/12 13:06	
EPA 350.1	Ammonia as N	1.15	mg/L	0.030	0.006		W212162	RHW	03/22/12 11:03	
EPA 353.2	Nitrate/Nitrite as N	0.097	mg/L	0.050	0.009		W212178	RHW	03/23/12 11:30	
EPA 410.4	Chemical Oxygen Demand	18.2	mg/L	5.0	2.5		W211284	SM	03/16/12 09:59	
SM 2320B/2310B	Bicarbonate	9.5	mg/L	1.0	0.1		W211163	DKS	03/15/12 09:59	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.1		W211163	DKS	03/15/12 09:59	
SM 2320B/2310B	Total Alkalinity	9.5	mg/L	1.0	0.1		W211163	DKS	03/15/12 09:59	
SM 2540 C	Total Diss. Solids	76	mg/L	10			W211172	RS	03/14/12 17:35	H3
SM 2540 D	Total Susp. Solids	23.0	mg/L	5.0			W211170	RS	03/14/12 17:35	H3
SM 4500 H B	pH @25.0°C	6.48	pH Units				W211163	DKS	03/15/12 09:59	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W211256	IIT	03/15/12 14:08	
SM 4500-P-E	Phosphorus	0.016	mg/L	0.010	0.005		W211351	SM	03/19/12 15:12	
SM 5310B	Total Organic Carbon	5.96	mg/L	1.00	0.27		W211288	SM	03/19/12 19:30	



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Kellogg ID 83837-0929

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Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: **W2C0204**

Reported: 28-Mar-12 11:59

Client Sample ID: **03MAR2012SW005**

SVL Sample ID: **W2C0204-12 (Surface Water)**

Sample Report Page 3 of 3

Sampled: 03-Mar-12 10:15

Received: 12-Mar-12

Sampled By: FH

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	5.13	mg/L	0.20	0.07		W212103	AEW	03/20/12 16:31	
EPA 300.0	Fluoride	< 0.10	mg/L	0.10	0.02		W212103	AEW	03/20/12 16:31	
EPA 300.0	Sulfate as SO4	2.90	mg/L	0.30	0.04		W212103	AEW	03/20/12 16:31	

Cation/Anion Balance and TDS Ratios

Cation Sum: 0.52 meq/L Anion Sum: 0.40 meq/L C/A Balance: 12.74 % Calculated TDS: 30 TDS/cTDS: 2.55 TDS/eC: 1.57

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2C0204**
Reported: 28-Mar-12 11:59

Quality Control - BLANK Data

Method	Analyte	Units	Result	MDL	MRL	Batch ID	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	mg/L	<0.00020	0.000072	0.00020	W211262	19-Mar-12	
EPA 245.1	Mercury	mg/L	<0.00020	0.000072	0.00020	W211268	19-Mar-12	

Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	mg/L	<0.080	0.008	0.080	W211075	27-Mar-12	
EPA 200.7	Barium	mg/L	<0.0020	0.0002	0.0020	W211075	27-Mar-12	
EPA 200.7	Beryllium	mg/L	<0.0020	0.0002	0.0020	W211075	27-Mar-12	
EPA 200.7	Boron	mg/L	<0.040	0.005	0.040	W211075	27-Mar-12	
EPA 200.7	Cadmium	mg/L	<0.0020	0.0002	0.0020	W211075	27-Mar-12	
EPA 200.7	Calcium	mg/L	<0.040	0.006	0.040	W211075	27-Mar-12	
EPA 200.7	Chromium	mg/L	<0.0060	0.0003	0.0060	W211075	27-Mar-12	
EPA 200.7	Cobalt	mg/L	<0.0060	0.0005	0.0060	W211075	27-Mar-12	
EPA 200.7	Copper	mg/L	<0.010	0.002	0.010	W211075	27-Mar-12	
EPA 200.7	Iron	mg/L	<0.060	0.008	0.060	W211075	27-Mar-12	
EPA 200.7	Lead	mg/L	<0.0075	0.0017	0.0075	W211075	27-Mar-12	
EPA 200.7	Magnesium	mg/L	<0.060	0.010	0.060	W211075	27-Mar-12	
EPA 200.7	Manganese	mg/L	<0.0040	0.0006	0.0040	W211075	27-Mar-12	
EPA 200.7	Molybdenum	mg/L	<0.008	0.0006	0.008	W211075	27-Mar-12	
EPA 200.7	Nickel	mg/L	<0.010	0.002	0.010	W211075	27-Mar-12	
EPA 200.7	Potassium	mg/L	<0.50	0.03	0.50	W211075	27-Mar-12	
EPA 200.7	Silicon	mg/L	<0.08	0.01	0.08	W211075	27-Mar-12	
EPA 200.7	Silver	mg/L	<0.0050	0.0003	0.0050	W211075	27-Mar-12	
EPA 200.7	Sodium	mg/L	<0.50	0.02	0.50	W211075	27-Mar-12	
EPA 200.7	Titanium	mg/L	<0.0050	0.0002	0.0050	W211075	27-Mar-12	
EPA 200.7	Vanadium	mg/L	<0.0050	0.0002	0.0050	W211075	27-Mar-12	
EPA 200.7	Zinc	mg/L	<0.0100	0.0010	0.0100	W211075	27-Mar-12	
EPA 200.8	Antimony	mg/L	<0.00300	0.00015	0.00300	W211129	21-Mar-12	
EPA 200.8	Arsenic	mg/L	<0.0030	0.0003	0.0030	W211129	21-Mar-12	
EPA 200.8	Selenium	mg/L	<0.00300	0.00028	0.00300	W211129	21-Mar-12	
EPA 200.8	Uranium	mg/L	<0.00100	0.000006	0.00100	W211129	21-Mar-12	
EPA 200.8	Thallium	mg/L	<0.00100	0.000004	0.00100	W211129	21-Mar-12	

Metals (Dissolved)

EPA 200.7	Aluminum	mg/L	<0.080	0.016	0.080	W211078	27-Mar-12	
EPA 200.7	Barium	mg/L	<0.0020	0.0004	0.0020	W211078	27-Mar-12	
EPA 200.7	Beryllium	mg/L	<0.0020	0.0004	0.0020	W211078	27-Mar-12	
EPA 200.7	Boron	mg/L	<0.040	0.010	0.040	W211078	27-Mar-12	
EPA 200.7	Cadmium	mg/L	<0.0020	0.0005	0.0020	W211078	27-Mar-12	
EPA 200.7	Calcium	mg/L	<0.040	0.012	0.040	W211078	27-Mar-12	
EPA 200.7	Chromium	mg/L	<0.0060	0.0006	0.0060	W211078	27-Mar-12	
EPA 200.7	Cobalt	mg/L	<0.0060	0.0009	0.0060	W211078	27-Mar-12	
EPA 200.7	Copper	mg/L	<0.010	0.003	0.010	W211078	27-Mar-12	
EPA 200.7	Iron	mg/L	<0.060	0.017	0.060	W211078	27-Mar-12	
EPA 200.7	Lead	mg/L	<0.0075	0.0034	0.0075	W211078	27-Mar-12	
EPA 200.7	Magnesium	mg/L	<0.060	0.021	0.060	W211078	27-Mar-12	
EPA 200.7	Manganese	mg/L	<0.0040	0.0011	0.0040	W211078	27-Mar-12	
EPA 200.7	Molybdenum	mg/L	<0.008	0.001	0.008	W211078	27-Mar-12	
EPA 200.7	Nickel	mg/L	<0.010	0.003	0.010	W211078	27-Mar-12	
EPA 200.7	Potassium	mg/L	<0.50	0.07	0.50	W211078	27-Mar-12	
EPA 200.7	Silicon	mg/L	<0.08	0.03	0.08	W211078	27-Mar-12	
EPA 200.7	Silver	mg/L	<0.0050	0.0005	0.0050	W211078	27-Mar-12	
EPA 200.7	Sodium	mg/L	<0.50	0.04	0.50	W211078	27-Mar-12	
EPA 200.7	Titanium	mg/L	<0.0050	0.0003	0.0050	W211078	27-Mar-12	
EPA 200.7	Vanadium	mg/L	<0.0050	0.0005	0.0050	W211078	27-Mar-12	
EPA 200.7	Zinc	mg/L	<0.0100	0.0021	0.0100	W211078	27-Mar-12	
EPA 200.8	Antimony	mg/L	<0.00300	0.00012	0.00300	W211131	21-Mar-12	
EPA 200.8	Arsenic	mg/L	<0.0030	0.0002	0.0030	W211131	21-Mar-12	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2C0204**
Reported: 28-Mar-12 11:59

Quality Control - BLANK Data (Continued)

Method	Analyte	Units	Result	MDL	MRL	Batch ID	Analyzed	Notes
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Metals (Dissolved) (Continued)

EPA 200.8	Selenium	mg/L	<0.00300	0.00022	0.00300	W211131	21-Mar-12	
EPA 200.8	Thallium	mg/L	<0.00100	0.0000033	0.00100	W211131	21-Mar-12	
EPA 200.8	Uranium	mg/L	<0.00100	0.0000049	0.00100	W211131	21-Mar-12	
EPA 245.1	Mercury	mg/L	<0.00020	0.000072	0.00020	W211167	15-Mar-12	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	mg/L	<0.005	0.0005	0.005	W211292	15-Mar-12	
EPA 120.1	Specific conductance	µmhos/cm	<5.00		5.00	W211173	14-Mar-12	
EPA 180.1	Turbidity	NTU	<0.100		0.100	W211135	13-Mar-12	
EPA 335.4	Cyanide (total)	mg/L	<0.0100	0.0021	0.0100	W211255	15-Mar-12	
EPA 350.1	Ammonia as N	mg/L	<0.030	0.006	0.030	W212162	22-Mar-12	
EPA 350.1	Ammonia as N	mg/L	<0.030	0.006	0.030	W212254	26-Mar-12	
EPA 353.2	Nitrate/Nitrite as N	mg/L	<0.050	0.009	0.050	W212178	23-Mar-12	
EPA 410.4	Chemical Oxygen Demand	mg/L	<5.0	2.5	5.0	W211284	16-Mar-12	
SM 2540 C	Total Diss. Solids	mg/L	<10		10	W211172	14-Mar-12	
SM 2540 D	Total Susp. Solids	mg/L	<5.0		5.0	W211170	14-Mar-12	
SM 4500-CN-I	Cyanide (WAD)	mg/L	<0.0100	0.0006	0.0100	W211256	15-Mar-12	
SM 4500-P-E	Phosphorus	mg/L	<0.010	0.005	0.010	W211351	19-Mar-12	
SM 5310B	Total Organic Carbon	mg/L	<1.00	0.27	1.00	W211288	19-Mar-12	
SM 5310B	Total Organic Carbon	mg/L	<1.00	0.27	1.00	W211336	19-Mar-12	

Anions by Ion Chromatography

EPA 300.0	Fluoride	mg/L	<0.10	0.02	0.10	W212103	20-Mar-12	
EPA 300.0	Chloride	mg/L	<0.20	0.07	0.20	W212103	20-Mar-12	
EPA 300.0	Sulfate as SO4	mg/L	<0.30	0.04	0.30	W212103	20-Mar-12	

Quality Control - LABORATORY CONTROL SAMPLE Data

Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	mg/L	0.00468	0.00500	93.6	85 - 115	W211262	19-Mar-12	
EPA 245.1	Mercury	mg/L	0.00488	0.00500	97.6	85 - 115	W211268	19-Mar-12	

Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	mg/L	1.07	1.00	107	85 - 115	W211075	27-Mar-12	
EPA 200.7	Barium	mg/L	1.03	1.00	103	85 - 115	W211075	27-Mar-12	
EPA 200.7	Beryllium	mg/L	1.01	1.00	101	85 - 115	W211075	27-Mar-12	
EPA 200.7	Boron	mg/L	1.05	1.00	105	85 - 115	W211075	27-Mar-12	
EPA 200.7	Cadmium	mg/L	1.01	1.00	101	85 - 115	W211075	27-Mar-12	
EPA 200.7	Calcium	mg/L	19.4	20.0	96.8	85 - 115	W211075	27-Mar-12	
EPA 200.7	Chromium	mg/L	1.05	1.00	105	85 - 115	W211075	27-Mar-12	
EPA 200.7	Cobalt	mg/L	0.998	1.00	99.8	85 - 115	W211075	27-Mar-12	
EPA 200.7	Copper	mg/L	1.05	1.00	105	85 - 115	W211075	27-Mar-12	
EPA 200.7	Iron	mg/L	9.72	10.0	97.2	85 - 115	W211075	27-Mar-12	
EPA 200.7	Lead	mg/L	1.00	1.00	100	85 - 115	W211075	27-Mar-12	
EPA 200.7	Magnesium	mg/L	19.4	20.0	96.8	85 - 115	W211075	27-Mar-12	
EPA 200.7	Manganese	mg/L	1.03	1.00	103	85 - 115	W211075	27-Mar-12	
EPA 200.7	Molybdenum	mg/L	1.03	1.00	103	85 - 115	W211075	27-Mar-12	
EPA 200.7	Nickel	mg/L	0.994	1.00	99.4	85 - 115	W211075	27-Mar-12	
EPA 200.7	Potassium	mg/L	20.4	20.0	102	85 - 115	W211075	27-Mar-12	
EPA 200.7	Silicon	mg/L	5.02	5.00	100	85 - 115	W211075	27-Mar-12	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2C0204**
Reported: 28-Mar-12 11:59

Quality Control - LABORATORY CONTROL SAMPLE Data (Continued)

Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Total Recoverable--reportable as Total per 40 CFR 136) (Continued)

EPA 200.7	Silver	mg/L	0.0530	0.0500	106	85 - 115	W211075	27-Mar-12	
EPA 200.7	Sodium	mg/L	19.0	19.0	100	85 - 115	W211075	27-Mar-12	
EPA 200.7	Titanium	mg/L	1.04	1.00	104	85 - 115	W211075	27-Mar-12	
EPA 200.7	Vanadium	mg/L	1.07	1.00	107	85 - 115	W211075	27-Mar-12	
EPA 200.7	Zinc	mg/L	0.991	1.00	99.1	85 - 115	W211075	27-Mar-12	
EPA 200.8	Antimony	mg/L	0.0284	0.0250	114	85 - 115	W211129	21-Mar-12	
EPA 200.8	Arsenic	mg/L	0.0255	0.0250	102	85 - 115	W211129	21-Mar-12	
EPA 200.8	Selenium	mg/L	0.0254	0.0250	101	85 - 115	W211129	21-Mar-12	
EPA 200.8	Uranium	mg/L	0.0258	0.0250	103	85 - 115	W211129	21-Mar-12	
EPA 200.8	Thallium	mg/L	0.0262	0.0250	105	85 - 115	W211129	21-Mar-12	

Metals (Dissolved)

EPA 200.7	Aluminum	mg/L	0.990	1.00	99.0	85 - 115	W211078	27-Mar-12	
EPA 200.7	Barium	mg/L	0.973	1.00	97.3	85 - 115	W211078	27-Mar-12	
EPA 200.7	Beryllium	mg/L	0.983	1.00	98.3	85 - 115	W211078	27-Mar-12	
EPA 200.7	Boron	mg/L	0.993	1.00	99.3	85 - 115	W211078	27-Mar-12	
EPA 200.7	Cadmium	mg/L	0.952	1.00	95.2	85 - 115	W211078	27-Mar-12	
EPA 200.7	Calcium	mg/L	20.0	20.0	100	85 - 115	W211078	27-Mar-12	
EPA 200.7	Chromium	mg/L	0.969	1.00	96.9	85 - 115	W211078	27-Mar-12	
EPA 200.7	Cobalt	mg/L	0.941	1.00	94.1	85 - 115	W211078	27-Mar-12	
EPA 200.7	Copper	mg/L	0.990	1.00	99.0	85 - 115	W211078	27-Mar-12	
EPA 200.7	Iron	mg/L	10.0	10.0	100	85 - 115	W211078	27-Mar-12	
EPA 200.7	Lead	mg/L	0.935	1.00	93.5	85 - 115	W211078	27-Mar-12	
EPA 200.7	Magnesium	mg/L	19.9	20.0	99.5	85 - 115	W211078	27-Mar-12	
EPA 200.7	Manganese	mg/L	0.987	1.00	98.7	85 - 115	W211078	27-Mar-12	
EPA 200.7	Molybdenum	mg/L	0.956	1.00	95.6	85 - 115	W211078	27-Mar-12	
EPA 200.7	Nickel	mg/L	0.923	1.00	92.3	85 - 115	W211078	27-Mar-12	
EPA 200.7	Potassium	mg/L	21.1	20.0	106	85 - 115	W211078	27-Mar-12	
EPA 200.7	Silicon	mg/L	4.75	5.00	94.9	85 - 115	W211078	27-Mar-12	
EPA 200.7	Silver	mg/L	0.0488	0.0500	97.7	85 - 115	W211078	27-Mar-12	
EPA 200.7	Sodium	mg/L	19.7	19.0	104	85 - 115	W211078	27-Mar-12	
EPA 200.7	Titanium	mg/L	0.964	1.00	96.4	85 - 115	W211078	27-Mar-12	
EPA 200.7	Vanadium	mg/L	0.986	1.00	98.6	85 - 115	W211078	27-Mar-12	
EPA 200.7	Zinc	mg/L	0.939	1.00	93.9	85 - 115	W211078	27-Mar-12	
EPA 200.8	Antimony	mg/L	0.0259	0.0250	104	85 - 115	W211131	21-Mar-12	
EPA 200.8	Arsenic	mg/L	0.0253	0.0250	101	85 - 115	W211131	21-Mar-12	
EPA 200.8	Selenium	mg/L	0.0257	0.0250	103	85 - 115	W211131	21-Mar-12	
EPA 200.8	Thallium	mg/L	0.0247	0.0250	99.0	85 - 115	W211131	21-Mar-12	
EPA 200.8	Uranium	mg/L	0.0251	0.0250	100	85 - 115	W211131	21-Mar-12	
EPA 245.1	Mercury	mg/L	0.00474	0.00500	94.8	85 - 115	W211167	15-Mar-12	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	mg/L	0.143	0.150	95.4	85 - 115	W211292	15-Mar-12	
EPA 120.1	Specific conductance	µmhos/cm	423	421	100	90 - 110	W211173	14-Mar-12	
EPA 180.1	Turbidity	NTU	4.60	4.39	105	90 - 110	W211135	13-Mar-12	
EPA 335.4	Cyanide (total)	mg/L	0.152	0.150	101	90 - 110	W211255	15-Mar-12	
EPA 350.1	Ammonia as N	mg/L	0.724	0.750	96.5	90 - 110	W212162	22-Mar-12	
EPA 350.1	Ammonia as N	mg/L	0.730	0.750	97.3	90 - 110	W212254	26-Mar-12	
EPA 353.2	Nitrate/Nitrite as N	mg/L	1.98	2.00	98.9	90 - 110	W212178	23-Mar-12	
EPA 410.4	Chemical Oxygen Demand	mg/L	112	113	99.2	90 - 110	W211284	16-Mar-12	
SM 4500-CN-I	Cyanide (WAD)	mg/L	0.150	0.150	100	90 - 110	W211256	15-Mar-12	
SM 4500-P-E	Phosphorus	mg/L	0.892	0.877	102	90 - 110	W211351	19-Mar-12	
SM 5310B	Total Organic Carbon	mg/L	64.0	66.7	96.0	80 - 120	W211288	19-Mar-12	
SM 5310B	Total Organic Carbon	mg/L	63.1	66.7	94.6	80 - 120	W211336	19-Mar-12	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



Tetra Tech EM, Inc. (Boise)
 3380 Americana Terrace, Suite 201
 Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
 Work Order: **W2C0204**
 Reported: 28-Mar-12 11:59

Quality Control - LABORATORY CONTROL SAMPLE Data (Continued)

Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
Anions by Ion Chromatography									
EPA 300.0	Fluoride	mg/L	1.98	2.00	99.1	90 - 110	W212103	20-Mar-12	
EPA 300.0	Chloride	mg/L	3.04	3.00	101	90 - 110	W212103	20-Mar-12	
EPA 300.0	Sulfate as SO4	mg/L	10.7	10.0	107	90 - 110	W212103	20-Mar-12	

Quality Control - DUPLICATE Data

Method	Analyte	Units	Duplicate Result	Sample Result	RPD	RPD Limit	Batch ID	Analyzed	Notes
Metals (Total)									
EPA 245.1	Mercury	mg/L	<0.00020	<0.00020	UDL	20	W211262	19-Mar-12	
EPA 245.1	Mercury	mg/L	<0.00020	<0.00020	UDL	20	W211268	19-Mar-12	
Metals (Total Recoverable--reportable as Total per 40 CFR 136)									
EPA 200.7	Aluminum	mg/L	0.120	0.122	1.2	20	W211075	27-Mar-12	
EPA 200.7	Barium	mg/L	0.0052	0.0053	2.0	20	W211075	27-Mar-12	
EPA 200.7	Beryllium	mg/L	<0.0020	<0.0020	UDL	20	W211075	27-Mar-12	
EPA 200.7	Boron	mg/L	<0.040	<0.040	<RL	20	W211075	27-Mar-12	
EPA 200.7	Cadmium	mg/L	<0.0020	<0.0020	UDL	20	W211075	27-Mar-12	
EPA 200.7	Calcium	mg/L	0.169	0.173	2.3	20	W211075	27-Mar-12	
EPA 200.7	Chromium	mg/L	<0.0060	<0.0060	<RL	20	W211075	27-Mar-12	
EPA 200.7	Cobalt	mg/L	<0.0060	<0.0060	UDL	20	W211075	27-Mar-12	
EPA 200.7	Copper	mg/L	<0.010	<0.010	UDL	20	W211075	27-Mar-12	
EPA 200.7	Iron	mg/L	0.561	0.566	0.8	20	W211075	27-Mar-12	
EPA 200.7	Lead	mg/L	<0.0075	<0.0075	UDL	20	W211075	27-Mar-12	
EPA 200.7	Magnesium	mg/L	0.529	0.535	1.1	20	W211075	27-Mar-12	
EPA 200.7	Manganese	mg/L	0.0149	0.0149	0.1	20	W211075	27-Mar-12	
EPA 200.7	Molybdenum	mg/L	<0.008	<0.008	UDL	20	W211075	27-Mar-12	
EPA 200.7	Nickel	mg/L	<0.010	<0.010	UDL	20	W211075	27-Mar-12	
EPA 200.7	Potassium	mg/L	<0.50	<0.50	<RL	20	W211075	27-Mar-12	
EPA 200.7	Silicon	mg/L	3.77	3.82	1.3	20	W211075	27-Mar-12	
EPA 200.7	Silver	mg/L	<0.0050	<0.0050	UDL	20	W211075	27-Mar-12	
EPA 200.7	Sodium	mg/L	2.48	2.51	1.3	20	W211075	27-Mar-12	
EPA 200.7	Titanium	mg/L	<0.0050	<0.0050	<RL	20	W211075	27-Mar-12	
EPA 200.7	Vanadium	mg/L	<0.0050	<0.0050	UDL	20	W211075	27-Mar-12	
EPA 200.7	Zinc	mg/L	<0.0100	<0.0100	<RL	20	W211075	27-Mar-12	
EPA 200.8	Antimony	mg/L	<0.00300	<0.00300	UDL	20	W211129	21-Mar-12	
EPA 200.8	Arsenic	mg/L	<0.0030	<0.0030	<RL	20	W211129	21-Mar-12	
EPA 200.8	Selenium	mg/L	<0.00300	<0.00300	UDL	20	W211129	21-Mar-12	
EPA 200.8	Uranium	mg/L	<0.00100	<0.00100	<RL	20	W211129	21-Mar-12	
EPA 200.8	Thallium	mg/L	<0.00100	<0.00100	UDL	20	W211129	21-Mar-12	
Metals (Dissolved)									
EPA 200.7	Aluminum	mg/L	0.097	0.082	16.9	20	W211078	27-Mar-12	
EPA 200.7	Barium	mg/L	0.0047	0.0047	0.4	20	W211078	27-Mar-12	
EPA 200.7	Beryllium	mg/L	<0.0020	<0.0020	UDL	20	W211078	27-Mar-12	
EPA 200.7	Boron	mg/L	<0.040	<0.040	UDL	20	W211078	27-Mar-12	
EPA 200.7	Cadmium	mg/L	<0.0020	<0.0020	UDL	20	W211078	27-Mar-12	
EPA 200.7	Calcium	mg/L	0.199	0.201	0.6	20	W211078	27-Mar-12	
EPA 200.7	Chromium	mg/L	<0.0060	<0.0060	<RL	20	W211078	27-Mar-12	
EPA 200.7	Cobalt	mg/L	<0.0060	<0.0060	UDL	20	W211078	27-Mar-12	
EPA 200.7	Copper	mg/L	<0.010	<0.010	UDL	20	W211078	27-Mar-12	
EPA 200.7	Iron	mg/L	0.262	0.264	0.5	20	W211078	27-Mar-12	
EPA 200.7	Lead	mg/L	<0.0075	<0.0075	UDL	20	W211078	27-Mar-12	
EPA 200.7	Magnesium	mg/L	0.510	0.511	0.1	20	W211078	27-Mar-12	



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2C0204**
Reported: 28-Mar-12 11:59

Quality Control - DUPLICATE Data (Continued)

Method	Analyte	Units	Duplicate Result	Sample Result	RPD	RPD Limit	Batch ID	Analyzed	Notes
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Metals (Dissolved) (Continued)

EPA 200.7	Manganese	mg/L	0.0160	0.0159	0.9	20	W211078	27-Mar-12	
EPA 200.7	Molybdenum	mg/L	<0.008	<0.008	UDL	20	W211078	27-Mar-12	
EPA 200.7	Nickel	mg/L	<0.010	<0.010	UDL	20	W211078	27-Mar-12	
EPA 200.7	Potassium	mg/L	<0.50	<0.50	<RL	20	W211078	27-Mar-12	
EPA 200.7	Silicon	mg/L	3.84	3.85	0.3	20	W211078	27-Mar-12	
EPA 200.7	Silver	mg/L	<0.0050	<0.0050	UDL	20	W211078	27-Mar-12	
EPA 200.7	Sodium	mg/L	2.45	2.45	0.1	20	W211078	27-Mar-12	
EPA 200.7	Titanium	mg/L	<0.0050	<0.0050	UDL	20	W211078	27-Mar-12	
EPA 200.7	Vanadium	mg/L	<0.0050	<0.0050	UDL	20	W211078	27-Mar-12	
EPA 200.7	Zinc	mg/L	<0.0100	<0.0100	UDL	20	W211078	27-Mar-12	
EPA 200.8	Antimony	mg/L	<0.00300	<0.00300	UDL	20	W211131	21-Mar-12	
EPA 200.8	Arsenic	mg/L	<0.0030	<0.0030	<RL	20	W211131	21-Mar-12	
EPA 200.8	Selenium	mg/L	<0.00300	<0.00300	UDL	20	W211131	21-Mar-12	
EPA 200.8	Thallium	mg/L	<0.00100	<0.00100	UDL	20	W211131	21-Mar-12	
EPA 200.8	Uranium	mg/L	<0.00100	<0.00100	<RL	20	W211131	21-Mar-12	
EPA 245.1	Mercury	mg/L	<0.00020	<0.00020	UDL	20	W211167	15-Mar-12	

Classical Chemistry Parameters

EPA 120.1	Specific conductance	µmhos/cm	22.6	22.4	0.8	20	W211173	14-Mar-12	
EPA 120.1	Specific conductance	µmhos/cm	24.6	24.4	0.9	20	W211173	14-Mar-12	
EPA 180.1	Turbidity	NTU	54.0	52.0	3.8	20	W211135	13-Mar-12	D2
EPA 335.4	Cyanide (total)	mg/L	<0.0100	<0.0100	UDL	20	W211255	15-Mar-12	
EPA 350.1	Ammonia as N	mg/L	0.030	0.047	43.5	20	W212162	22-Mar-12	R2
EPA 350.1	Ammonia as N	mg/L	1.89	1.72	8.9	20	W212254	26-Mar-12	D2
EPA 353.2	Nitrate/Nitrite as N	mg/L	4.37	4.47	2.4	20	W212178	23-Mar-12	D2
EPA 410.4	Chemical Oxygen Demand	mg/L	17.0	18.9	10.5	20	W211284	16-Mar-12	
SM 2320B/2310B	Total Alkalinity	mg/L	1.4	<1.0	<RL	20	W211163	15-Mar-12	R2
SM 2320B/2310B	Total Alkalinity	mg/L	<1.0	<1.0	UDL	20	W211163	15-Mar-12	
SM 2320B/2310B	Bicarbonate	mg/L	1.4	<1.0	<RL	20	W211163	15-Mar-12	R2
SM 2320B/2310B	Bicarbonate	mg/L	<1.0	<1.0	UDL	20	W211163	15-Mar-12	
SM 2320B/2310B	Carbonate	mg/L	<1.0	<1.0	UDL	20	W211163	15-Mar-12	
SM 2320B/2310B	Carbonate	mg/L	<1.0	<1.0	UDL	20	W211163	15-Mar-12	
SM 2540 C	Total Diss. Solids	mg/L	44	62	34.0	10	W211172	14-Mar-12	R1
SM 2540 C	Total Diss. Solids	mg/L	56	47	17.5	10	W211172	14-Mar-12	R1
SM 2540 D	Total Susp. Solids	mg/L	17.0	16.0	6.1	10	W211170	14-Mar-12	
SM 2540 D	Total Susp. Solids	mg/L	18.0	22.0	20.0	10	W211170	14-Mar-12	R1
SM 4500 H B	pH	pH Units	4.86	4.90	0.8	20	W211163	15-Mar-12	
SM 4500 H B	pH	pH Units	5.64	5.37	4.9	20	W211163	15-Mar-12	R1
SM 4500-CN-I	Cyanide (WAD)	mg/L	<0.0100	<0.0100	UDL	20	W211256	15-Mar-12	
SM 4500-P-E	Phosphorus	mg/L	<0.010	<0.010	UDL	20	W211351	19-Mar-12	
SM 5310B	Total Organic Carbon	mg/L	6.33	6.10	3.7	20	W211288	19-Mar-12	
SM 5310B	Total Organic Carbon	mg/L	8.15	8.41	3.1	20	W211336	19-Mar-12	

Anions by Ion Chromatography

EPA 300.0	Fluoride	mg/L	<0.10	<0.10	<RL	20	W212103	20-Mar-12	
EPA 300.0	Chloride	mg/L	4.60	4.61	0.2	20	W212103	20-Mar-12	
EPA 300.0	Sulfate as SO4	mg/L	<0.30	<0.30	<RL	20	W212103	20-Mar-12	



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2C0204**
Reported: 28-Mar-12 11:59

Quality Control - MATRIX SPIKE Data

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	mg/L	0.00099	<0.00020	0.000990	100	70 - 130	W211262	19-Mar-12	
EPA 245.1	Mercury	mg/L	0.00115	<0.00020	0.000990	99.0	70 - 130	W211262	19-Mar-12	
EPA 245.1	Mercury	mg/L	0.00100	<0.00020	0.000990	101	70 - 130	W211268	19-Mar-12	
EPA 245.1	Mercury	mg/L	0.00175	0.00084	0.000990	91.9	70 - 130	W211268	19-Mar-12	

Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	mg/L	1.26	0.122	1.00	114	70 - 130	W211075	27-Mar-12	
EPA 200.7	Aluminum	mg/L	35.9	8.02	1.00	R > 4S	70 - 130	W211075	27-Mar-12	M3
EPA 200.7	Barium	mg/L	1.02	0.0053	1.00	101	70 - 130	W211075	27-Mar-12	
EPA 200.7	Barium	mg/L	1.08	0.0250	1.00	105	70 - 130	W211075	27-Mar-12	
EPA 200.7	Beryllium	mg/L	1.02	<0.0020	1.00	102	70 - 130	W211075	27-Mar-12	
EPA 200.7	Beryllium	mg/L	1.02	<0.0020	1.00	102	70 - 130	W211075	27-Mar-12	
EPA 200.7	Boron	mg/L	1.07	<0.040	1.00	106	70 - 130	W211075	27-Mar-12	
EPA 200.7	Boron	mg/L	1.06	<0.040	1.00	105	70 - 130	W211075	27-Mar-12	
EPA 200.7	Cadmium	mg/L	0.993	<0.0020	1.00	99.3	70 - 130	W211075	27-Mar-12	
EPA 200.7	Cadmium	mg/L	0.996	<0.0020	1.00	99.6	70 - 130	W211075	27-Mar-12	
EPA 200.7	Calcium	mg/L	19.7	0.173	20.0	97.7	70 - 130	W211075	27-Mar-12	
EPA 200.7	Calcium	mg/L	20.6	0.987	20.0	97.8	70 - 130	W211075	27-Mar-12	
EPA 200.7	Chromium	mg/L	1.04	<0.0060	1.00	104	70 - 130	W211075	27-Mar-12	
EPA 200.7	Chromium	mg/L	1.09	0.0276	1.00	106	70 - 130	W211075	27-Mar-12	
EPA 200.7	Cobalt	mg/L	0.992	<0.0060	1.00	99.2	70 - 130	W211075	27-Mar-12	
EPA 200.7	Cobalt	mg/L	1.00	<0.0060	1.00	99.9	70 - 130	W211075	27-Mar-12	
EPA 200.7	Copper	mg/L	1.06	<0.010	1.00	106	70 - 130	W211075	27-Mar-12	
EPA 200.7	Copper	mg/L	1.09	<0.010	1.00	108	70 - 130	W211075	27-Mar-12	
EPA 200.7	Iron	mg/L	10.3	0.566	10.0	97.7	70 - 130	W211075	27-Mar-12	
EPA 200.7	Iron	mg/L	24.7	14.3	10.0	104	70 - 130	W211075	27-Mar-12	
EPA 200.7	Lead	mg/L	0.986	<0.0075	1.00	98.6	70 - 130	W211075	27-Mar-12	
EPA 200.7	Lead	mg/L	0.990	<0.0075	1.00	98.4	70 - 130	W211075	27-Mar-12	
EPA 200.7	Magnesium	mg/L	19.9	0.535	20.0	96.9	70 - 130	W211075	27-Mar-12	
EPA 200.7	Magnesium	mg/L	21.7	1.83	20.0	99.4	70 - 130	W211075	27-Mar-12	
EPA 200.7	Manganese	mg/L	1.05	0.0149	1.00	103	70 - 130	W211075	27-Mar-12	
EPA 200.7	Manganese	mg/L	1.16	0.118	1.00	104	70 - 130	W211075	27-Mar-12	
EPA 200.7	Molybdenum	mg/L	1.02	<0.008	1.00	102	70 - 130	W211075	27-Mar-12	
EPA 200.7	Molybdenum	mg/L	0.948	<0.008	1.00	94.8	70 - 130	W211075	27-Mar-12	
EPA 200.7	Nickel	mg/L	0.988	<0.010	1.00	98.8	70 - 130	W211075	27-Mar-12	
EPA 200.7	Nickel	mg/L	1.03	0.011	1.00	102	70 - 130	W211075	27-Mar-12	
EPA 200.7	Potassium	mg/L	20.9	<0.50	20.0	104	70 - 130	W211075	27-Mar-12	
EPA 200.7	Potassium	mg/L	22.5	0.77	20.0	109	70 - 130	W211075	27-Mar-12	
EPA 200.7	Silicon	mg/L	9.03	3.82	5.00	104	70 - 130	W211075	27-Mar-12	
EPA 200.7	Silicon	mg/L	45.2	10.9	5.00	687	70 - 130	W211075	27-Mar-12	M1
EPA 200.7	Silver	mg/L	0.0520	<0.0050	0.0500	104	70 - 130	W211075	27-Mar-12	
EPA 200.7	Silver	mg/L	0.0521	<0.0050	0.0500	104	70 - 130	W211075	27-Mar-12	
EPA 200.7	Sodium	mg/L	21.9	2.51	19.0	102	70 - 130	W211075	27-Mar-12	
EPA 200.7	Sodium	mg/L	22.5	3.38	19.0	101	70 - 130	W211075	27-Mar-12	
EPA 200.7	Titanium	mg/L	1.04	<0.0050	1.00	104	70 - 130	W211075	27-Mar-12	
EPA 200.7	Titanium	mg/L	1.02	0.0241	1.00	99.8	70 - 130	W211075	27-Mar-12	
EPA 200.7	Vanadium	mg/L	1.06	<0.0050	1.00	106	70 - 130	W211075	27-Mar-12	
EPA 200.7	Vanadium	mg/L	1.08	0.0147	1.00	106	70 - 130	W211075	27-Mar-12	
EPA 200.7	Zinc	mg/L	0.974	<0.0100	1.00	97.2	70 - 130	W211075	27-Mar-12	
EPA 200.7	Zinc	mg/L	1.01	0.0160	1.00	99.4	70 - 130	W211075	27-Mar-12	
EPA 200.8	Antimony	mg/L	0.0291	<0.00300	0.0250	116	70 - 130	W211129	21-Mar-12	
EPA 200.8	Antimony	mg/L	0.0111	<0.00300	0.0250	44.3	70 - 130	W211129	21-Mar-12	M2
EPA 200.8	Arsenic	mg/L	0.0257	<0.0030	0.0250	101	70 - 130	W211129	21-Mar-12	
EPA 200.8	Arsenic	mg/L	0.0146	<0.0030	0.0250	51.3	70 - 130	W211129	21-Mar-12	M2
EPA 200.8	Selenium	mg/L	0.0258	<0.00300	0.0250	103	70 - 130	W211129	21-Mar-12	
EPA 200.8	Selenium	mg/L	0.00696	<0.00300	0.0250	26.6	70 - 130	W211129	21-Mar-12	M2
EPA 200.8	Uranium	mg/L	0.0260	<0.00100	0.0250	104	70 - 130	W211129	21-Mar-12	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



Tetra Tech EM, Inc. (Boise)
 3380 Americana Terrace, Suite 201
 Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
 Work Order: **W2C0204**
 Reported: 28-Mar-12 11:59

Quality Control - MATRIX SPIKE Data (Continued)

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Total Recoverable--reportable as Total per 40 CFR 136) (Continued)

EPA 200.8	Uranium	mg/L	0.0254	<0.00100	0.0250	100	70 - 130	W211129	21-Mar-12	
EPA 200.8	Thallium	mg/L	0.0265	<0.00100	0.0250	106	70 - 130	W211129	21-Mar-12	
EPA 200.8	Thallium	mg/L	0.0250	<0.00100	0.0250	99.8	70 - 130	W211129	21-Mar-12	

Metals (Dissolved)

EPA 200.7	Aluminum	mg/L	1.20	0.082	1.00	112	70 - 130	W211078	27-Mar-12	
EPA 200.7	Aluminum	mg/L	1.06	<0.080	1.00	98.9	70 - 130	W211078	27-Mar-12	
EPA 200.7	Barium	mg/L	1.09	0.0047	1.00	109	70 - 130	W211078	27-Mar-12	
EPA 200.7	Barium	mg/L	0.996	0.0044	1.00	99.2	70 - 130	W211078	27-Mar-12	
EPA 200.7	Beryllium	mg/L	1.06	<0.0020	1.00	106	70 - 130	W211078	27-Mar-12	
EPA 200.7	Beryllium	mg/L	0.989	<0.0020	1.00	98.9	70 - 130	W211078	27-Mar-12	
EPA 200.7	Boron	mg/L	1.15	<0.040	1.00	115	70 - 130	W211078	27-Mar-12	
EPA 200.7	Boron	mg/L	1.04	<0.040	1.00	104	70 - 130	W211078	27-Mar-12	
EPA 200.7	Cadmium	mg/L	1.06	<0.0020	1.00	106	70 - 130	W211078	27-Mar-12	
EPA 200.7	Cadmium	mg/L	0.982	<0.0020	1.00	98.2	70 - 130	W211078	27-Mar-12	
EPA 200.7	Calcium	mg/L	21.1	0.201	20.0	105	70 - 130	W211078	27-Mar-12	
EPA 200.7	Calcium	mg/L	19.9	0.749	20.0	95.6	70 - 130	W211078	27-Mar-12	
EPA 200.7	Chromium	mg/L	1.08	<0.0060	1.00	108	70 - 130	W211078	27-Mar-12	
EPA 200.7	Chromium	mg/L	0.997	<0.0060	1.00	99.6	70 - 130	W211078	27-Mar-12	
EPA 200.7	Cobalt	mg/L	1.06	<0.0060	1.00	106	70 - 130	W211078	27-Mar-12	
EPA 200.7	Cobalt	mg/L	0.973	<0.0060	1.00	97.3	70 - 130	W211078	27-Mar-12	
EPA 200.7	Copper	mg/L	1.12	<0.010	1.00	112	70 - 130	W211078	27-Mar-12	
EPA 200.7	Copper	mg/L	1.03	<0.010	1.00	103	70 - 130	W211078	27-Mar-12	
EPA 200.7	Iron	mg/L	10.9	0.264	10.0	106	70 - 130	W211078	27-Mar-12	
EPA 200.7	Iron	mg/L	10.3	0.768	10.0	95.7	70 - 130	W211078	27-Mar-12	
EPA 200.7	Lead	mg/L	1.06	<0.0075	1.00	106	70 - 130	W211078	27-Mar-12	
EPA 200.7	Lead	mg/L	0.967	<0.0075	1.00	96.7	70 - 130	W211078	27-Mar-12	
EPA 200.7	Magnesium	mg/L	21.6	0.511	20.0	105	70 - 130	W211078	27-Mar-12	
EPA 200.7	Magnesium	mg/L	20.2	1.05	20.0	95.8	70 - 130	W211078	27-Mar-12	
EPA 200.7	Manganese	mg/L	1.10	0.0159	1.00	108	70 - 130	W211078	27-Mar-12	
EPA 200.7	Manganese	mg/L	1.05	0.0599	1.00	99.0	70 - 130	W211078	27-Mar-12	
EPA 200.7	Molybdenum	mg/L	1.07	<0.008	1.00	107	70 - 130	W211078	27-Mar-12	
EPA 200.7	Molybdenum	mg/L	0.981	<0.008	1.00	98.1	70 - 130	W211078	27-Mar-12	
EPA 200.7	Nickel	mg/L	1.04	<0.010	1.00	104	70 - 130	W211078	27-Mar-12	
EPA 200.7	Nickel	mg/L	0.959	<0.010	1.00	95.9	70 - 130	W211078	27-Mar-12	
EPA 200.7	Potassium	mg/L	22.4	<0.50	20.0	111	70 - 130	W211078	27-Mar-12	
EPA 200.7	Potassium	mg/L	20.8	0.63	20.0	101	70 - 130	W211078	27-Mar-12	
EPA 200.7	Silicon	mg/L	9.22	3.85	5.00	108	70 - 130	W211078	27-Mar-12	
EPA 200.7	Silicon	mg/L	8.79	3.90	5.00	97.8	70 - 130	W211078	27-Mar-12	
EPA 200.7	Silver	mg/L	0.0548	<0.0050	0.0500	110	70 - 130	W211078	27-Mar-12	
EPA 200.7	Silver	mg/L	0.0455	<0.0050	0.0500	91.0	70 - 130	W211078	27-Mar-12	
EPA 200.7	Sodium	mg/L	23.5	2.45	19.0	111	70 - 130	W211078	27-Mar-12	
EPA 200.7	Sodium	mg/L	22.4	3.28	19.0	101	70 - 130	W211078	27-Mar-12	
EPA 200.7	Titanium	mg/L	1.08	<0.0050	1.00	108	70 - 130	W211078	27-Mar-12	
EPA 200.7	Titanium	mg/L	0.987	<0.0050	1.00	98.7	70 - 130	W211078	27-Mar-12	
EPA 200.7	Vanadium	mg/L	1.11	<0.0050	1.00	111	70 - 130	W211078	27-Mar-12	
EPA 200.7	Vanadium	mg/L	1.01	<0.0050	1.00	101	70 - 130	W211078	27-Mar-12	
EPA 200.7	Zinc	mg/L	1.05	<0.0100	1.00	105	70 - 130	W211078	27-Mar-12	
EPA 200.7	Zinc	mg/L	0.970	<0.0100	1.00	97.0	70 - 130	W211078	27-Mar-12	
EPA 200.8	Antimony	mg/L	0.0263	<0.00300	0.0250	105	70 - 130	W211131	21-Mar-12	
EPA 200.8	Antimony	mg/L	0.0268	<0.00300	0.0250	107	70 - 130	W211131	21-Mar-12	
EPA 200.8	Arsenic	mg/L	0.0267	<0.0030	0.0250	105	70 - 130	W211131	21-Mar-12	
EPA 200.8	Arsenic	mg/L	0.0266	<0.0030	0.0250	104	70 - 130	W211131	21-Mar-12	
EPA 200.8	Selenium	mg/L	0.0282	<0.00300	0.0250	113	70 - 130	W211131	21-Mar-12	
EPA 200.8	Selenium	mg/L	0.0282	<0.00300	0.0250	110	70 - 130	W211131	21-Mar-12	
EPA 200.8	Thallium	mg/L	0.0248	<0.00100	0.0250	99.1	70 - 130	W211131	21-Mar-12	
EPA 200.8	Thallium	mg/L	0.0241	<0.00100	0.0250	96.5	70 - 130	W211131	21-Mar-12	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2C0204**
Reported: 28-Mar-12 11:59

Quality Control - MATRIX SPIKE Data (Continued)

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Dissolved) (Continued)

EPA 200.8	Uranium	mg/L	0.0254	<0.00100	0.0250	101	70 - 130	W211131	21-Mar-12	
EPA 200.8	Uranium	mg/L	0.0249	<0.00100	0.0250	99.6	70 - 130	W211131	21-Mar-12	
EPA 245.1	Mercury	mg/L	0.00097	<0.00020	0.000990	98.0	70 - 130	W211167	15-Mar-12	
EPA 245.1	Mercury	mg/L	0.00100	<0.00020	0.000990	101	70 - 130	W211167	15-Mar-12	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	mg/L	0.133	0.046	0.100	87.3	85 - 115	W211292	15-Mar-12	
ASTM D7237	Cyanide (free)	mg/L	0.098	<0.005	0.100	96.1	85 - 115	W211292	15-Mar-12	
EPA 335.4	Cyanide (total)	mg/L	0.103	<0.0100	0.100	103	90 - 110	W211255	15-Mar-12	
EPA 335.4	Cyanide (total)	mg/L	0.104	<0.0100	0.100	104	90 - 110	W211255	15-Mar-12	
EPA 350.1	Ammonia as N	mg/L	0.554	0.047	0.500	101	90 - 110	W212162	22-Mar-12	
EPA 350.1	Ammonia as N	mg/L	2.47	1.72	0.500	150	90 - 110	W212254	26-Mar-12	D2,M3
EPA 350.1	Ammonia as N	mg/L	0.639	0.089	0.500	110	90 - 110	W212254	26-Mar-12	
EPA 353.2	Nitrate/Nitrite as N	mg/L	1.23	<0.050	1.00	121	90 - 110	W212178	23-Mar-12	M1
EPA 353.2	Nitrate/Nitrite as N	mg/L	5.51	4.47	1.00	104	90 - 110	W212178	23-Mar-12	D2
EPA 410.4	Chemical Oxygen Demand	mg/L	70.8	18.9	50.0	104	90 - 110	W211284	16-Mar-12	
EPA 410.4	Chemical Oxygen Demand	mg/L	71.8	26.0	50.0	91.7	90 - 110	W211284	16-Mar-12	
SM 4500-CN-I	Cyanide (WAD)	mg/L	0.102	<0.0100	0.100	102	75 - 125	W211256	15-Mar-12	
SM 4500-CN-I	Cyanide (WAD)	mg/L	0.101	<0.0100	0.100	101	75 - 125	W211256	15-Mar-12	
SM 4500-P-E	Phosphorus	mg/L	0.521	<0.010	0.500	104	75 - 125	W211351	19-Mar-12	
SM 5310B	Total Organic Carbon	mg/L	57.2	6.10	50.0	102	75 - 125	W211288	19-Mar-12	
SM 5310B	Total Organic Carbon	mg/L	58.2	8.41	50.0	99.5	75 - 125	W211336	19-Mar-12	

Anions by Ion Chromatography

EPA 300.0	Fluoride	mg/L	1.96	<0.10	2.00	96.3	90 - 110	W212103	20-Mar-12	
EPA 300.0	Fluoride	mg/L	1.93	<0.10	2.00	96.6	90 - 110	W212103	20-Mar-12	
EPA 300.0	Chloride	mg/L	7.81	4.61	3.00	107	90 - 110	W212103	20-Mar-12	
EPA 300.0	Chloride	mg/L	3.55	0.54	3.00	100	90 - 110	W212103	20-Mar-12	
EPA 300.0	Sulfate as SO4	mg/L	10.7	<0.30	10.0	106	90 - 110	W212103	20-Mar-12	
EPA 300.0	Sulfate as SO4	mg/L	11.4	0.75	10.0	106	90 - 110	W212103	20-Mar-12	

Quality Control - MATRIX SPIKE DUPLICATE Data

Method	Analyte	Units	MSD Result	Spike Result	Spike Level	RPD	RPD Limit	Batch ID	Analyzed	Notes
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Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	mg/L	0.136	0.133	0.100	2.5	20	W211292	15-Mar-12	
ASTM D7237	Cyanide (free)	mg/L	0.103	0.098	0.100	4.8	20	W211292	15-Mar-12	

Quality Control - POST DIGESTION SPIKE Data

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Silicon	mg/L	14.3	10.9	5.00	67.7	85 - 115	W211075	27-Mar-12	M2
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Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2C0204**
Reported: 28-Mar-12 11:59

Notes and Definitions

D2	Sample required dilution due to high concentration of target analyte.
D5	Sample required dilution to meet internal standard recovery limits.
H3	Sample was received and analyzed past holding time.
H5	This test is specified to be performed in the field within 15 minutes of sampling; sample was received and analyzed past the regulatory holding time.
M1	Matrix spike recovery was high, but the LCS recovery was acceptable.
M2	Matrix spike recovery was low, but the LCS recovery was acceptable.
M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to spike level. The LCS was acceptable.
N3	Sample contains high particulates.
R1	RPD exceeded the method acceptance limit.
R2	RPD exceeded the laboratory acceptance limit.
LCS	Laboratory Control Sample (Blank Spike)
RPD	Relative Percent Difference
UDL	A result is less than the detection limit
R > 4S	% recovery not applicable, sample concentration more than four times greater than spike level
<RL	A result is less than the reporting limit
MRL	Method Reporting Limit
MDL	Method Detection Limit
N/A	Not Applicable



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2C0178**
Reported: 26-Mar-12 13:05

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Sampled By	Date Received
02MAR2012SW002	W2C0178-01	Surface Water	02-Mar-12 11:30	JM/GM	09-Mar-2012
02MAR2012SW001	W2C0178-02	Surface Water	02-Mar-12 10:00	JM/GM	09-Mar-2012
02MAR2012SW003	W2C0178-03	Surface Water	02-Mar-12 14:45	JM/GM	09-Mar-2012
02MAR2012SW004	W2C0178-04	Surface Water	02-Mar-12 16:00	JM/GM	09-Mar-2012
03MAR2012SW006	W2C0178-05	Surface Water	03-Mar-12 15:45	JM/GM	09-Mar-2012
03MAR2012SW005	W2C0178-06	Surface Water	03-Mar-12 10:15	JM/GM	09-Mar-2012

Solid samples are analyzed on an as-received, wet-weight basis, unless otherwise requested. Non-Detects are reported at the MDL. Sample preparation is defined by the client as per their Data Quality Objectives.

This report supercedes any previous reports for this Work Order. The complete report includes pages for each sample, a full QC report, and a notes section.

The results presented in this report relate only to the samples, and meet all requirements of the NELAC Standards unless otherwise noted.

(Q6) SVL received the following containers outside of published EPA guidelines for preservation temperatures (0-6°C).

The guidelines do not pertain to nitric-preserved metals.

Default Cooler (Received Temperature: 17.6°C)

Labnumber	Container	Client ID	Labnumber	Container	Client ID
W2C0178-01 A	Raw HDPE	02MAR2012SW002	W2C0178-01 B	Sulfuric HDPE	02MAR2012SW002
W2C0178-01 C	Filtered nitric HDPE	02MAR2012SW002	W2C0178-01 D	Nitric HDPE	02MAR2012SW002
W2C0178-01 E	NaOH HDPE	02MAR2012SW002	W2C0178-01 F	Sulfuric VOA	02MAR2012SW002
W2C0178-01 G	Sulfuric VOA	02MAR2012SW002	W2C0178-01 H	Sulfuric Amber Glass	02MAR2012SW002
W2C0178-02 A	Raw HDPE	02MAR2012SW001	W2C0178-02 B	Sulfuric HDPE	02MAR2012SW001
W2C0178-02 C	Filtered nitric HDPE	02MAR2012SW001	W2C0178-02 D	Nitric HDPE	02MAR2012SW001
W2C0178-02 E	NaOH HDPE	02MAR2012SW001	W2C0178-02 F	Sulfuric VOA	02MAR2012SW001
W2C0178-02 G	Sulfuric VOA	02MAR2012SW001	W2C0178-02 H	Sulfuric Amber Glass	02MAR2012SW001
W2C0178-03 A	Raw HDPE	02MAR2012SW003	W2C0178-03 B	Sulfuric HDPE	02MAR2012SW003
W2C0178-03 C	Filtered nitric HDPE	02MAR2012SW003	W2C0178-03 D	Nitric HDPE	02MAR2012SW003
W2C0178-03 E	NaOH HDPE	02MAR2012SW003	W2C0178-03 F	Sulfuric VOA	02MAR2012SW003
W2C0178-03 G	Sulfuric VOA	02MAR2012SW003	W2C0178-03 H	Sulfuric Amber Glass	02MAR2012SW003
W2C0178-04 A	Raw HDPE	02MAR2012SW004	W2C0178-04 B	Sulfuric HDPE	02MAR2012SW004
W2C0178-04 C	Filtered nitric HDPE	02MAR2012SW004	W2C0178-04 D	Nitric HDPE	02MAR2012SW004
W2C0178-04 E	NaOH HDPE	02MAR2012SW004	W2C0178-04 F	Sulfuric VOA	02MAR2012SW004
W2C0178-04 G	Sulfuric VOA	02MAR2012SW004	W2C0178-04 H	Sulfuric Amber Glass	02MAR2012SW004
W2C0178-05 A	Raw HDPE	03MAR2012SW006	W2C0178-05 B	Sulfuric HDPE	03MAR2012SW006
W2C0178-05 C	Filtered nitric HDPE	03MAR2012SW006	W2C0178-05 D	Nitric HDPE	03MAR2012SW006
W2C0178-05 E	NaOH HDPE	03MAR2012SW006	W2C0178-05 F	Sulfuric VOA	03MAR2012SW006
W2C0178-05 G	Sulfuric VOA	03MAR2012SW006	W2C0178-05 H	Sulfuric Amber Glass	03MAR2012SW006
W2C0178-06 A	Raw HDPE	03MAR2012SW005	W2C0178-06 B	Sulfuric HDPE	03MAR2012SW005
W2C0178-06 C	Filtered nitric HDPE	03MAR2012SW005	W2C0178-06 D	Nitric HDPE	03MAR2012SW005
W2C0178-06 E	NaOH HDPE	03MAR2012SW005	W2C0178-06 F	Sulfuric VOA	03MAR2012SW005
W2C0178-06 G	Sulfuric VOA	03MAR2012SW005	W2C0178-06 H	Sulfuric Amber Glass	03MAR2012SW005



Tetra Tech EM, Inc. (Boise)
 3380 Americana Terrace, Suite 201
 Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
 Work Order: **W2C0178**
 Reported: 26-Mar-12 13:05

Client Sample ID: **02MAR2012SW002**

SVL Sample ID: **W2C0178-01 (Surface Water)**

Sample Report Page 1 of 3

Sampled: 02-Mar-12 11:30
 Received: 09-Mar-12
 Sampled By: JM/GM

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W211099	DJA	03/14/12 17:01	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	0.650	mg/L	0.080	0.008		W211002	DT	03/23/12 09:37	
EPA 200.7	Barium	0.0087	mg/L	0.0020	0.0002		W211002	DT	03/23/12 09:37	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0002		W211002	DT	03/23/12 09:37	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W211002	DT	03/23/12 09:37	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0002		W211002	DT	03/23/12 09:37	
EPA 200.7	Calcium	1.19	mg/L	0.040	0.006		W211002	DT	03/23/12 09:37	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0003		W211002	DT	03/23/12 09:37	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W211002	DT	03/23/12 09:37	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.002		W211002	DT	03/23/12 09:37	
EPA 200.7	Iron	6.29	mg/L	0.060	0.008		W211002	DT	03/23/12 09:37	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0017		W211002	DT	03/23/12 09:37	
EPA 200.7	Magnesium	0.968	mg/L	0.060	0.010		W211002	DT	03/23/12 09:37	
EPA 200.7	Manganese	0.0289	mg/L	0.0040	0.0006		W211002	DT	03/23/12 09:37	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.0006		W211002	DT	03/23/12 09:37	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W211002	DT	03/23/12 09:37	
EPA 200.7	Potassium	0.88	mg/L	0.50	0.03		W211002	DT	03/23/12 09:37	
EPA 200.7	Silicon	2.70	mg/L	0.08	0.01		W211002	DT	03/23/12 09:37	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0003		W211002	DT	03/23/12 09:37	
EPA 200.7	Sodium	2.51	mg/L	0.50	0.02		W211002	DT	03/23/12 09:37	
EPA 200.7	Titanium	0.0069	mg/L	0.0050	0.0002		W211002	DT	03/23/12 09:37	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0002		W211002	DT	03/23/12 09:37	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0010		W211002	DT	03/23/12 09:37	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W211005	KWH	03/15/12 13:33	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W211005	KWH	03/15/12 13:33	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W211005	KWH	03/15/12 13:33	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000004	2.5	W211005	KWH	03/15/12 13:33	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000006	2.5	W211005	KWH	03/15/12 13:33	
SM 2340B	Hardness(as CaCO3)	6.96	mg/L	0.347	0.058		N/A		03/23/12 09:37	



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2C0178**
Reported: 26-Mar-12 13:05

Client Sample ID: **02MAR2012SW002**

SVL Sample ID: **W2C0178-01 (Surface Water)**

Sample Report Page 2 of 3

Sampled: 02-Mar-12 11:30
Received: 09-Mar-12
Sampled By: JM/GM

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.016		W211004	AS	03/25/12 11:48	
EPA 200.7	Barium	0.0047	mg/L	0.0020	0.0004		W211004	AS	03/25/12 11:48	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0004		W211004	AS	03/25/12 11:48	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W211004	AS	03/25/12 11:48	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W211004	AS	03/25/12 11:48	
EPA 200.7	Calcium	1.13	mg/L	0.040	0.012		W211004	AS	03/25/12 11:48	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W211004	AS	03/25/12 11:48	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W211004	AS	03/25/12 11:48	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.003		W211004	AS	03/25/12 11:48	
EPA 200.7	Iron	0.944	mg/L	0.060	0.017		W211004	AS	03/25/12 11:48	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0034		W211004	AS	03/25/12 11:48	
EPA 200.7	Magnesium	0.848	mg/L	0.060	0.021		W211004	AS	03/25/12 11:48	
EPA 200.7	Manganese	0.0280	mg/L	0.0040	0.0011		W211004	AS	03/25/12 11:48	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W211004	AS	03/25/12 11:48	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W211004	AS	03/25/12 11:48	
EPA 200.7	Potassium	0.81	mg/L	0.50	0.07		W211004	AS	03/25/12 11:48	
EPA 200.7	Silicon	2.40	mg/L	0.08	0.03		W211004	AS	03/25/12 11:48	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0005		W211004	AS	03/25/12 11:48	
EPA 200.7	Sodium	2.46	mg/L	0.50	0.04		W211004	AS	03/25/12 11:48	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W211004	AS	03/25/12 11:48	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W211004	AS	03/25/12 11:48	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0021		W211004	AS	03/25/12 11:48	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W211010	KWH	03/20/12 06:11	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W211010	KWH	03/20/12 06:11	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W211010	KWH	03/20/12 06:11	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000033		W211010	KWH	03/20/12 06:11	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000049		W211010	KWH	03/20/12 06:11	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W211097	DJA	03/14/12 16:11	
Classical Chemistry Parameters										
ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0005		W210179	IIT	03/12/12 09:56	
EPA 120.1	Specific conductance	28.6	µmhos/cm	5.00			W211024	JMS	03/09/12 15:25	
EPA 180.1	Turbidity	57.6	NTU	0.200		2	W211056	SM	03/12/12 13:08	D2,H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W211255	IIT	03/15/12 12:16	
EPA 350.1	Ammonia as N	0.235	mg/L	0.030	0.006		W211301	RHW	03/19/12 12:53	
EPA 353.2	Nitrate/Nitrite as N	0.161	mg/L	0.050	0.009		W212176	RHW	03/23/12 09:02	
EPA 410.4	Chemical Oxygen Demand	30.7	mg/L	5.0	2.5		W211045	SM	03/13/12 10:05	
SM 2320B/2310B	Bicarbonate	5.6	mg/L	1.0	0.1		W211040	AGF	03/14/12 13:13	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.1		W211040	AGF	03/14/12 13:13	
SM 2320B/2310B	Total Alkalinity	5.6	mg/L	1.0	0.1		W211040	AGF	03/14/12 13:13	
SM 2540 C	Total Diss. Solids	51	mg/L	10			W210318	JMS	03/09/12 15:35	
SM 2540 D	Total Susp. Solids	19.0	mg/L	5.0			W210317	JMS	03/09/12 15:35	
SM 4500 H B	pH @22.0°C	6.44	pH Units				W211040	AGF	03/14/12 13:13	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W211256	IIT	03/15/12 13:18	
SM 4500-P-E	Phosphorus	< 0.010	mg/L	0.010	0.003		W211219	SM	03/15/12 15:36	
SM 5310B	Total Organic Carbon	5.67	mg/L	1.00	0.27		W211288	SM	03/19/12 17:00	



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

(208) 784-1258

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Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: **W2C0178**

Reported: 26-Mar-12 13:05

Client Sample ID: **02MAR2012SW002**

SVL Sample ID: **W2C0178-01 (Surface Water)**

Sample Report Page 3 of 3

Sampled: 02-Mar-12 11:30

Received: 09-Mar-12

Sampled By: JM/GM

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	3.42	mg/L	0.20	0.07		W211338	AEW	03/16/12 13:52	
EPA 300.0	Fluoride	< 0.10	mg/L	0.10	0.02		W211338	AEW	03/16/12 13:52	
EPA 300.0	Sulfate as SO4	0.81	mg/L	0.30	0.04		W211338	AEW	03/16/12 13:52	

Cation/Anion Balance and TDS Ratios

Cation Sum: 0.31 meq/L Anion Sum: 0.24 meq/L C/A Balance: 12.74 % Calculated TDS: 21 TDS/cTDS: 2.47 TDS/eC: 1.78

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2C0178**
Reported: 26-Mar-12 13:05

Client Sample ID: **02MAR2012SW001**

SVL Sample ID: **W2C0178-02 (Surface Water)**

Sample Report Page 1 of 3

Sampled: 02-Mar-12 10:00
Received: 09-Mar-12
Sampled By: JM/GM

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W211099	DJA	03/14/12 17:08	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	1.71	mg/L	0.080	0.008		W211002	DT	03/23/12 09:54	
EPA 200.7	Barium	0.0096	mg/L	0.0020	0.0002		W211002	DT	03/23/12 09:54	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0002		W211002	DT	03/23/12 09:54	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W211002	DT	03/23/12 09:54	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0002		W211002	DT	03/23/12 09:54	
EPA 200.7	Calcium	0.918	mg/L	0.040	0.006		W211002	DT	03/23/12 09:54	
EPA 200.7	Chromium	0.0066	mg/L	0.0060	0.0003		W211002	DT	03/23/12 09:54	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W211002	DT	03/23/12 09:54	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.002		W211002	DT	03/23/12 09:54	
EPA 200.7	Iron	8.01	mg/L	0.060	0.008		W211002	DT	03/23/12 09:54	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0017		W211002	DT	03/23/12 09:54	
EPA 200.7	Magnesium	0.804	mg/L	0.060	0.010		W211002	DT	03/23/12 09:54	
EPA 200.7	Manganese	0.0553	mg/L	0.0040	0.0006		W211002	DT	03/23/12 09:54	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.0006		W211002	DT	03/23/12 09:54	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W211002	DT	03/23/12 09:54	
EPA 200.7	Potassium	0.71	mg/L	0.50	0.03		W211002	DT	03/23/12 09:54	
EPA 200.7	Silicon	3.02	mg/L	0.08	0.01		W211002	DT	03/23/12 09:54	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0003		W211002	DT	03/23/12 09:54	
EPA 200.7	Sodium	2.34	mg/L	0.50	0.02		W211002	DT	03/23/12 09:54	
EPA 200.7	Titanium	0.0135	mg/L	0.0050	0.0002		W211002	DT	03/23/12 09:54	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0002		W211002	DT	03/23/12 09:54	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0010		W211002	DT	03/23/12 09:54	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W211005	KWH	03/15/12 13:20	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W211005	KWH	03/15/12 13:20	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W211005	KWH	03/15/12 13:20	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000004	2.5	W211005	KWH	03/15/12 13:20	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000006	2.5	W211005	KWH	03/15/12 13:20	
SM 2340B	Hardness(as CaCO3)	5.60	mg/L	0.347	0.058		N/A		03/23/12 09:54	



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2C0178**
Reported: 26-Mar-12 13:05

Client Sample ID: **02MAR2012SW001**

SVL Sample ID: **W2C0178-02 (Surface Water)**

Sample Report Page 2 of 3

Sampled: 02-Mar-12 10:00
Received: 09-Mar-12
Sampled By: JM/GM

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.016		W211004	AS	03/25/12 11:54	
EPA 200.7	Barium	0.0048	mg/L	0.0020	0.0004		W211004	AS	03/25/12 11:54	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0004		W211004	AS	03/25/12 11:54	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W211004	AS	03/25/12 11:54	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W211004	AS	03/25/12 11:54	
EPA 200.7	Calcium	0.857	mg/L	0.040	0.012		W211004	AS	03/25/12 11:54	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W211004	AS	03/25/12 11:54	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W211004	AS	03/25/12 11:54	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.003		W211004	AS	03/25/12 11:54	
EPA 200.7	Iron	0.583	mg/L	0.060	0.017		W211004	AS	03/25/12 11:54	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0034		W211004	AS	03/25/12 11:54	
EPA 200.7	Magnesium	0.676	mg/L	0.060	0.021		W211004	AS	03/25/12 11:54	
EPA 200.7	Manganese	0.0498	mg/L	0.0040	0.0011		W211004	AS	03/25/12 11:54	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W211004	AS	03/25/12 11:54	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W211004	AS	03/25/12 11:54	
EPA 200.7	Potassium	0.62	mg/L	0.50	0.07		W211004	AS	03/25/12 11:54	
EPA 200.7	Silicon	2.32	mg/L	0.08	0.03		W211004	AS	03/25/12 11:54	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0005		W211004	AS	03/25/12 11:54	
EPA 200.7	Sodium	2.29	mg/L	0.50	0.04		W211004	AS	03/25/12 11:54	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W211004	AS	03/25/12 11:54	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W211004	AS	03/25/12 11:54	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0021		W211004	AS	03/25/12 11:54	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W211010	KWH	03/20/12 06:13	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W211010	KWH	03/20/12 06:13	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W211010	KWH	03/20/12 06:13	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000033		W211010	KWH	03/20/12 06:13	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000049		W211010	KWH	03/20/12 06:13	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W211273	DJA	03/15/12 13:34	
Classical Chemistry Parameters										
ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0005		W210179	IIT	03/12/12 10:04	
EPA 120.1	Specific conductance	26.8	µmhos/cm	5.00			W211024	JMS	03/09/12 15:25	
EPA 180.1	Turbidity	158	NTU	0.400		4	W211056	SM	03/12/12 13:08	D2,H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W211255	IIT	03/15/12 12:18	
EPA 350.1	Ammonia as N	0.392	mg/L	0.030	0.006		W211301	RHW	03/19/12 13:16	
EPA 353.2	Nitrate/Nitrite as N	0.074	mg/L	0.050	0.009		W212176	RHW	03/23/12 09:06	
EPA 410.4	Chemical Oxygen Demand	24.1	mg/L	5.0	2.5		W211045	SM	03/13/12 10:05	
SM 2320B/2310B	Bicarbonate	5.1	mg/L	1.0	0.1		W211040	AGF	03/14/12 13:18	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.1		W211040	AGF	03/14/12 13:18	
SM 2320B/2310B	Total Alkalinity	5.1	mg/L	1.0	0.1		W211040	AGF	03/14/12 13:18	
SM 2540 C	Total Diss. Solids	34	mg/L	10			W210318	JMS	03/09/12 15:35	
SM 2540 D	Total Susp. Solids	89.0	mg/L	5.0			W210317	JMS	03/09/12 15:35	
SM 4500 H B	pH @21.0°C	6.44	pH Units				W211040	AGF	03/14/12 13:18	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W211256	IIT	03/15/12 13:20	
SM 4500-P-E	Phosphorus	0.014	mg/L	0.010	0.003		W211219	SM	03/15/12 15:36	
SM 5310B	Total Organic Carbon	6.10	mg/L	1.00	0.27		W211288	SM	03/19/12 17:12	



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Kellogg ID 83837-0929

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Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: **W2C0178**

Reported: 26-Mar-12 13:05

Client Sample ID: **02MAR2012SW001**

SVL Sample ID: **W2C0178-02 (Surface Water)**

Sample Report Page 3 of 3

Sampled: 02-Mar-12 10:00

Received: 09-Mar-12

Sampled By: JM/GM

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	3.53	mg/L	0.20	0.07		W211338	AEW	03/16/12 14:15	
EPA 300.0	Fluoride	< 0.10	mg/L	0.10	0.02		W211338	AEW	03/16/12 14:15	
EPA 300.0	Sulfate as SO4	0.89	mg/L	0.30	0.04		W211338	AEW	03/16/12 14:15	

Cation/Anion Balance and TDS Ratios

Cation Sum: 0.27 meq/L Anion Sum: 0.23 meq/L C/A Balance: 8.10 % Calculated TDS: 20 TDS/cTDS: 1.73 TDS/eC: 1.27

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2C0178**
Reported: 26-Mar-12 13:05

Client Sample ID: **02MAR2012SW003**

SVL Sample ID: **W2C0178-03 (Surface Water)**

Sample Report Page 1 of 3

Sampled: 02-Mar-12 14:45
Received: 09-Mar-12
Sampled By: JM/GM

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	0.00020	mg/L	0.00020	0.000072		W211099	DJA	03/14/12 17:09	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	3.64	mg/L	0.080	0.008		W211002	DT	03/23/12 09:59	
EPA 200.7	Barium	0.0185	mg/L	0.0020	0.0002		W211002	DT	03/23/12 09:59	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0002		W211002	DT	03/23/12 09:59	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W211002	DT	03/23/12 09:59	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0002		W211002	DT	03/23/12 09:59	
EPA 200.7	Calcium	0.997	mg/L	0.040	0.006		W211002	DT	03/23/12 09:59	
EPA 200.7	Chromium	0.0204	mg/L	0.0060	0.0003		W211002	DT	03/23/12 09:59	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W211002	DT	03/23/12 09:59	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.002		W211002	DT	03/23/12 09:59	
EPA 200.7	Iron	16.2	mg/L	0.060	0.008		W211002	DT	03/23/12 09:59	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0017		W211002	DT	03/23/12 09:59	
EPA 200.7	Magnesium	1.00	mg/L	0.060	0.010		W211002	DT	03/23/12 09:59	
EPA 200.7	Manganese	0.353	mg/L	0.0040	0.0006		W211002	DT	03/23/12 09:59	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.0006		W211002	DT	03/23/12 09:59	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W211002	DT	03/23/12 09:59	
EPA 200.7	Potassium	1.29	mg/L	0.50	0.03		W211002	DT	03/23/12 09:59	
EPA 200.7	Silicon	4.41	mg/L	0.08	0.01		W211002	DT	03/23/12 09:59	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0003		W211002	DT	03/23/12 09:59	
EPA 200.7	Sodium	3.15	mg/L	0.50	0.02		W211002	DT	03/23/12 09:59	
EPA 200.7	Titanium	0.0423	mg/L	0.0050	0.0002		W211002	DT	03/23/12 09:59	
EPA 200.7	Vanadium	0.0159	mg/L	0.0050	0.0002		W211002	DT	03/23/12 09:59	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0010		W211002	DT	03/23/12 09:59	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W211005	KWH	03/15/12 13:38	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W211005	KWH	03/15/12 13:38	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W211005	KWH	03/15/12 13:38	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000004	2.5	W211005	KWH	03/15/12 13:38	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000006	2.5	W211005	KWH	03/15/12 13:38	
SM 2340B	Hardness(as CaCO3)	6.61	mg/L	0.347	0.058		N/A		03/23/12 09:59	



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2C0178**
Reported: 26-Mar-12 13:05

Client Sample ID: **02MAR2012SW003**

SVL Sample ID: **W2C0178-03 (Surface Water)**

Sample Report Page 2 of 3

Sampled: 02-Mar-12 14:45
Received: 09-Mar-12
Sampled By: JM/GM

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.016		W211004	AS	03/25/12 11:59	
EPA 200.7	Barium	0.0072	mg/L	0.0020	0.0004		W211004	AS	03/25/12 11:59	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0004		W211004	AS	03/25/12 11:59	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W211004	AS	03/25/12 11:59	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W211004	AS	03/25/12 11:59	
EPA 200.7	Calcium	0.874	mg/L	0.040	0.012		W211004	AS	03/25/12 11:59	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W211004	AS	03/25/12 11:59	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W211004	AS	03/25/12 11:59	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.003		W211004	AS	03/25/12 11:59	
EPA 200.7	Iron	1.43	mg/L	0.060	0.017		W211004	AS	03/25/12 11:59	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0034		W211004	AS	03/25/12 11:59	
EPA 200.7	Magnesium	0.788	mg/L	0.060	0.021		W211004	AS	03/25/12 11:59	
EPA 200.7	Manganese	0.281	mg/L	0.0040	0.0011		W211004	AS	03/25/12 11:59	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W211004	AS	03/25/12 11:59	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W211004	AS	03/25/12 11:59	
EPA 200.7	Potassium	1.10	mg/L	0.50	0.07		W211004	AS	03/25/12 11:59	
EPA 200.7	Silicon	2.58	mg/L	0.08	0.03		W211004	AS	03/25/12 11:59	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0005		W211004	AS	03/25/12 11:59	
EPA 200.7	Sodium	3.07	mg/L	0.50	0.04		W211004	AS	03/25/12 11:59	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W211004	AS	03/25/12 11:59	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W211004	AS	03/25/12 11:59	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0021		W211004	AS	03/25/12 11:59	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W211010	KWH	03/20/12 06:18	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W211010	KWH	03/20/12 06:18	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W211010	KWH	03/20/12 06:18	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000033		W211010	KWH	03/20/12 06:18	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000049		W211010	KWH	03/20/12 06:18	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W211097	DJA	03/14/12 16:16	
Classical Chemistry Parameters										
ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0005		W210179	IIT	03/12/12 10:06	
EPA 120.1	Specific conductance	35.2	µmhos/cm	5.00			W211024	JMS	03/09/12 15:25	
EPA 180.1	Turbidity	840	NTU	5.00		50	W211056	SM	03/12/12 13:08	D2,H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W211255	IIT	03/15/12 12:20	
EPA 350.1	Ammonia as N	0.666	mg/L	0.030	0.006		W211301	RHW	03/19/12 13:23	
EPA 353.2	Nitrate/Nitrite as N	0.106	mg/L	0.050	0.009		W212176	RHW	03/23/12 09:10	
EPA 410.4	Chemical Oxygen Demand	24.7	mg/L	5.0	2.5		W211045	SM	03/13/12 10:05	
SM 2320B/2310B	Bicarbonate	5.1	mg/L	1.0	0.1		W211040	AGF	03/14/12 13:24	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.1		W211040	AGF	03/14/12 13:24	
SM 2320B/2310B	Total Alkalinity	5.1	mg/L	1.0	0.1		W211040	AGF	03/14/12 13:24	
SM 2540 C	Total Diss. Solids	39	mg/L	10			W210318	JMS	03/09/12 15:35	N3
SM 2540 D	Total Susp. Solids	896	mg/L	20.0			W210317	JMS	03/12/12 13:41	H6
SM 4500 H B	pH @22.0°C	6.48	pH Units				W211040	AGF	03/14/12 13:24	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W211256	IIT	03/15/12 13:28	
SM 4500-P-E	Phosphorus	0.040	mg/L	0.010	0.003		W211219	SM	03/15/12 15:36	
SM 5310B	Total Organic Carbon	9.12	mg/L	1.00	0.27		W211288	SM	03/19/12 17:54	



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Kellogg ID 83837-0929

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Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: **W2C0178**

Reported: 26-Mar-12 13:05

Client Sample ID: **02MAR2012SW003**

SVL Sample ID: **W2C0178-03 (Surface Water)**

Sample Report Page 3 of 3

Sampled: 02-Mar-12 14:45

Received: 09-Mar-12

Sampled By: JM/GM

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	4.45	mg/L	0.20	0.07		W211338	AEW	03/16/12 14:26	
EPA 300.0	Fluoride	< 0.10	mg/L	0.10	0.02		W211338	AEW	03/16/12 14:26	
EPA 300.0	Sulfate as SO4	2.05	mg/L	0.30	0.04		W211338	AEW	03/16/12 14:26	

Cation/Anion Balance and TDS Ratios

Cation Sum: 0.38 meq/L Anion Sum: 0.28 meq/L C/A Balance: 15.48 % Calculated TDS: 26 TDS/cTDS: 1.52 TDS/eC: 1.11

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Tetra Tech EM, Inc. (Boise)
 3380 Americana Terrace, Suite 201
 Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
 Work Order: **W2C0178**
 Reported: 26-Mar-12 13:05

Client Sample ID: **02MAR2012SW004**

SVL Sample ID: **W2C0178-04 (Surface Water)**

Sample Report Page 1 of 3

Sampled: 02-Mar-12 16:00
 Received: 09-Mar-12
 Sampled By: JM/GM

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W211099	DJA	03/14/12 17:11	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	4.63	mg/L	0.080	0.008		W211002	DT	03/23/12 10:05	
EPA 200.7	Barium	0.0201	mg/L	0.0020	0.0002		W211002	DT	03/23/12 10:05	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0002		W211002	DT	03/23/12 10:05	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W211002	DT	03/23/12 10:05	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0002		W211002	DT	03/23/12 10:05	
EPA 200.7	Calcium	0.976	mg/L	0.040	0.006		W211002	DT	03/23/12 10:05	
EPA 200.7	Chromium	0.0282	mg/L	0.0060	0.0003		W211002	DT	03/23/12 10:05	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W211002	DT	03/23/12 10:05	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.002		W211002	DT	03/23/12 10:05	
EPA 200.7	Iron	19.1	mg/L	0.060	0.008		W211002	DT	03/23/12 10:05	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0017		W211002	DT	03/23/12 10:05	
EPA 200.7	Magnesium	1.03	mg/L	0.060	0.010		W211002	DT	03/23/12 10:05	
EPA 200.7	Manganese	0.335	mg/L	0.0040	0.0006		W211002	DT	03/23/12 10:05	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.0006		W211002	DT	03/23/12 10:05	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W211002	DT	03/23/12 10:05	
EPA 200.7	Potassium	1.28	mg/L	0.50	0.03		W211002	DT	03/23/12 10:05	
EPA 200.7	Silicon	5.08	mg/L	0.08	0.01		W211002	DT	03/23/12 10:05	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0003		W211002	DT	03/23/12 10:05	
EPA 200.7	Sodium	3.10	mg/L	0.50	0.02		W211002	DT	03/23/12 10:05	
EPA 200.7	Titanium	0.0514	mg/L	0.0050	0.0002		W211002	DT	03/23/12 10:05	
EPA 200.7	Vanadium	0.0204	mg/L	0.0050	0.0002		W211002	DT	03/23/12 10:05	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0010		W211002	DT	03/23/12 10:05	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W211005	KWH	03/15/12 13:40	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W211005	KWH	03/15/12 13:40	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W211005	KWH	03/15/12 13:40	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000004	2.5	W211005	KWH	03/15/12 13:40	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000006	2.5	W211005	KWH	03/15/12 13:40	
SM 2340B	Hardness(as CaCO3)	6.67	mg/L	0.347	0.058		N/A		03/23/12 10:05	



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2C0178**
Reported: 26-Mar-12 13:05

Client Sample ID: **02MAR2012SW004**

SVL Sample ID: **W2C0178-04 (Surface Water)**

Sample Report Page 2 of 3

Sampled: 02-Mar-12 16:00
Received: 09-Mar-12
Sampled By: JM/GM

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.016		W211004	AS	03/25/12 12:05	
EPA 200.7	Barium	0.0067	mg/L	0.0020	0.0004		W211004	AS	03/25/12 12:05	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0004		W211004	AS	03/25/12 12:05	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W211004	AS	03/25/12 12:05	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W211004	AS	03/25/12 12:05	
EPA 200.7	Calcium	0.843	mg/L	0.040	0.012		W211004	AS	03/25/12 12:05	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W211004	AS	03/25/12 12:05	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W211004	AS	03/25/12 12:05	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.003		W211004	AS	03/25/12 12:05	
EPA 200.7	Iron	1.47	mg/L	0.060	0.017		W211004	AS	03/25/12 12:05	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0034		W211004	AS	03/25/12 12:05	
EPA 200.7	Magnesium	0.795	mg/L	0.060	0.021		W211004	AS	03/25/12 12:05	
EPA 200.7	Manganese	0.260	mg/L	0.0040	0.0011		W211004	AS	03/25/12 12:05	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W211004	AS	03/25/12 12:05	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W211004	AS	03/25/12 12:05	
EPA 200.7	Potassium	1.08	mg/L	0.50	0.07		W211004	AS	03/25/12 12:05	
EPA 200.7	Silicon	2.69	mg/L	0.08	0.03		W211004	AS	03/25/12 12:05	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0005		W211004	AS	03/25/12 12:05	
EPA 200.7	Sodium	3.04	mg/L	0.50	0.04		W211004	AS	03/25/12 12:05	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W211004	AS	03/25/12 12:05	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W211004	AS	03/25/12 12:05	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0021		W211004	AS	03/25/12 12:05	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W211010	KWH	03/20/12 06:19	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W211010	KWH	03/20/12 06:19	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W211010	KWH	03/20/12 06:19	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000033		W211010	KWH	03/20/12 06:19	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000049		W211010	KWH	03/20/12 06:19	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W211097	DJA	03/14/12 16:18	
Classical Chemistry Parameters										
ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0005		W210179	IIT	03/12/12 10:08	
EPA 120.1	Specific conductance	35.0	µmhos/cm	5.00			W211024	JMS	03/09/12 15:25	
EPA 180.1	Turbidity	745	NTU	5.00		50	W211056	SM	03/12/12 13:08	D2,H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W211255	IIT	03/15/12 12:22	
EPA 350.1	Ammonia as N	0.637	mg/L	0.030	0.006		W211301	RHW	03/19/12 13:24	
EPA 353.2	Nitrate/Nitrite as N	0.091	mg/L	0.050	0.009		W212176	RHW	03/23/12 09:12	
EPA 410.4	Chemical Oxygen Demand	22.9	mg/L	5.0	2.5		W211045	SM	03/13/12 10:05	
SM 2320B/2310B	Bicarbonate	5.1	mg/L	1.0	0.1		W211040	AGF	03/14/12 13:29	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.1		W211040	AGF	03/14/12 13:29	
SM 2320B/2310B	Total Alkalinity	5.1	mg/L	1.0	0.1		W211040	AGF	03/14/12 13:29	
SM 2540 C	Total Diss. Solids	62	mg/L	10			W210318	JMS	03/09/12 15:35	N3
SM 2540 D	Total Susp. Solids	71.0	mg/L	5.0			W210317	JMS	03/09/12 15:35	
SM 4500 H B	pH @21.0°C	6.42	pH Units				W211040	AGF	03/14/12 13:29	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W211256	IIT	03/15/12 13:30	
SM 4500-P-E	Phosphorus	0.042	mg/L	0.010	0.003		W211219	SM	03/15/12 15:36	
SM 5310B	Total Organic Carbon	9.02	mg/L	1.00	0.27		W211288	SM	03/19/12 18:10	



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Kellogg ID 83837-0929

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Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: **W2C0178**

Reported: 26-Mar-12 13:05

Client Sample ID: **02MAR2012SW004**

SVL Sample ID: **W2C0178-04 (Surface Water)**

Sample Report Page 3 of 3

Sampled: 02-Mar-12 16:00

Received: 09-Mar-12

Sampled By: JM/GM

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	4.49	mg/L	0.20	0.07		W211338	AEW	03/16/12 14:38	
EPA 300.0	Fluoride	< 0.10	mg/L	0.10	0.02		W211338	AEW	03/16/12 14:38	
EPA 300.0	Sulfate as SO4	1.84	mg/L	0.30	0.04		W211338	AEW	03/16/12 14:38	

Cation/Anion Balance and TDS Ratios

Cation Sum: 0.38 meq/L Anion Sum: 0.27 meq/L C/A Balance: 15.70 % Calculated TDS: 26 TDS/cTDS: 2.35 TDS/eC: 1.77

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2C0178**
Reported: 26-Mar-12 13:05

Client Sample ID: **03MAR2012SW006**

SVL Sample ID: **W2C0178-05 (Surface Water)**

Sample Report Page 1 of 3

Sampled: 03-Mar-12 15:45
Received: 09-Mar-12
Sampled By: JM/GM

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W211099	DJA	03/14/12 17:12	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	0.852	mg/L	0.080	0.008		W211002	DT	03/23/12 10:11	
EPA 200.7	Barium	0.0075	mg/L	0.0020	0.0002		W211002	DT	03/23/12 10:11	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0002		W211002	DT	03/23/12 10:11	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W211002	DT	03/23/12 10:11	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0002		W211002	DT	03/23/12 10:11	
EPA 200.7	Calcium	1.14	mg/L	0.040	0.006		W211002	DT	03/23/12 10:11	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0003		W211002	DT	03/23/12 10:11	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W211002	DT	03/23/12 10:11	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.002		W211002	DT	03/23/12 10:11	
EPA 200.7	Iron	6.96	mg/L	0.060	0.008		W211002	DT	03/23/12 10:11	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0017		W211002	DT	03/23/12 10:11	
EPA 200.7	Magnesium	1.15	mg/L	0.060	0.010		W211002	DT	03/23/12 10:11	
EPA 200.7	Manganese	0.0388	mg/L	0.0040	0.0006		W211002	DT	03/23/12 10:11	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.0006		W211002	DT	03/23/12 10:11	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W211002	DT	03/23/12 10:11	
EPA 200.7	Potassium	0.79	mg/L	0.50	0.03		W211002	DT	03/23/12 10:11	
EPA 200.7	Silicon	3.34	mg/L	0.08	0.01		W211002	DT	03/23/12 10:11	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0003		W211002	DT	03/23/12 10:11	
EPA 200.7	Sodium	2.81	mg/L	0.50	0.02		W211002	DT	03/23/12 10:11	
EPA 200.7	Titanium	0.0118	mg/L	0.0050	0.0002		W211002	DT	03/23/12 10:11	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0002		W211002	DT	03/23/12 10:11	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0010		W211002	DT	03/23/12 10:11	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W211005	KWH	03/15/12 13:42	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W211005	KWH	03/15/12 13:42	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W211005	KWH	03/15/12 13:42	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000004	2.5	W211005	KWH	03/15/12 13:42	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000006	2.5	W211005	KWH	03/15/12 13:42	
SM 2340B	Hardness(as CaCO3)	7.57	mg/L	0.347	0.058		N/A		03/23/12 10:11	



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2C0178**
Reported: 26-Mar-12 13:05

Client Sample ID: **03MAR2012SW006**

SVL Sample ID: **W2C0178-05 (Surface Water)**

Sample Report Page 2 of 3

Sampled: 03-Mar-12 15:45
Received: 09-Mar-12
Sampled By: JM/GM

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.016		W211004	AS	03/25/12 12:23	
EPA 200.7	Barium	0.0047	mg/L	0.0020	0.0004		W211004	AS	03/25/12 12:23	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0004		W211004	AS	03/25/12 12:23	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W211004	AS	03/25/12 12:23	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W211004	AS	03/25/12 12:23	
EPA 200.7	Calcium	1.08	mg/L	0.040	0.012		W211004	AS	03/25/12 12:23	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W211004	AS	03/25/12 12:23	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W211004	AS	03/25/12 12:23	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.003		W211004	AS	03/25/12 12:23	
EPA 200.7	Iron	1.16	mg/L	0.060	0.017		W211004	AS	03/25/12 12:23	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0034		W211004	AS	03/25/12 12:23	
EPA 200.7	Magnesium	1.01	mg/L	0.060	0.021		W211004	AS	03/25/12 12:23	
EPA 200.7	Manganese	0.0362	mg/L	0.0040	0.0011		W211004	AS	03/25/12 12:23	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W211004	AS	03/25/12 12:23	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W211004	AS	03/25/12 12:23	
EPA 200.7	Potassium	0.74	mg/L	0.50	0.07		W211004	AS	03/25/12 12:23	
EPA 200.7	Silicon	2.73	mg/L	0.08	0.03		W211004	AS	03/25/12 12:23	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0005		W211004	AS	03/25/12 12:23	
EPA 200.7	Sodium	2.74	mg/L	0.50	0.04		W211004	AS	03/25/12 12:23	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W211004	AS	03/25/12 12:23	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W211004	AS	03/25/12 12:23	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0021		W211004	AS	03/25/12 12:23	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W211010	KWH	03/20/12 06:21	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W211010	KWH	03/20/12 06:21	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W211010	KWH	03/20/12 06:21	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000033		W211010	KWH	03/20/12 06:21	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000049		W211010	KWH	03/20/12 06:21	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W211097	DJA	03/14/12 16:20	
Classical Chemistry Parameters										
ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0005		W210179	IIT	03/12/12 10:10	
EPA 120.1	Specific conductance	30.4	µmhos/cm	5.00			W211024	JMS	03/09/12 15:25	
EPA 180.1	Turbidity	50.2	NTU	0.200		2	W211056	SM	03/12/12 13:08	D2,H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W211255	IIT	03/15/12 12:24	
EPA 350.1	Ammonia as N	0.084	mg/L	0.030	0.006		W211301	RHW	03/19/12 13:29	
EPA 353.2	Nitrate/Nitrite as N	0.086	mg/L	0.050	0.009		W212176	RHW	03/23/12 09:13	
EPA 410.4	Chemical Oxygen Demand	27.1	mg/L	5.0	2.5		W211045	SM	03/13/12 10:05	
SM 2320B/2310B	Bicarbonate	5.1	mg/L	1.0	0.1		W211040	AGF	03/14/12 13:33	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.1		W211040	AGF	03/14/12 13:33	
SM 2320B/2310B	Total Alkalinity	5.1	mg/L	1.0	0.1		W211040	AGF	03/14/12 13:33	
SM 2540 C	Total Diss. Solids	39	mg/L	10			W210318	JMS	03/09/12 15:35	
SM 2540 D	Total Susp. Solids	15.0	mg/L	5.0			W210317	JMS	03/09/12 15:35	
SM 4500 H B	pH @21.0°C	6.36	pH Units				W211040	AGF	03/14/12 13:33	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W211256	IIT	03/15/12 13:32	
SM 4500-P-E	Phosphorus	0.010	mg/L	0.010	0.003		W211219	SM	03/15/12 15:36	
SM 5310B	Total Organic Carbon	9.31	mg/L	1.00	0.27		W211288	SM	03/19/12 18:24	



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Kellogg ID 83837-0929

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Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: **W2C0178**

Reported: 26-Mar-12 13:05

Client Sample ID: **03MAR2012SW006**

SVL Sample ID: **W2C0178-05 (Surface Water)**

Sample Report Page 3 of 3

Sampled: 03-Mar-12 15:45

Received: 09-Mar-12

Sampled By: JM/GM

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	3.85	mg/L	0.20	0.07		W211338	AEW	03/16/12 14:50	
EPA 300.0	Fluoride	< 0.10	mg/L	0.10	0.02		W211338	AEW	03/16/12 14:50	
EPA 300.0	Sulfate as SO4	0.74	mg/L	0.30	0.04		W211338	AEW	03/16/12 14:50	

Cation/Anion Balance and TDS Ratios

Cation Sum: 0.33 meq/L Anion Sum: 0.23 meq/L C/A Balance: 16.56 % Calculated TDS: 22 TDS/cTDS: 1.77 TDS/eC: 1.28

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2C0178**
Reported: 26-Mar-12 13:05

Client Sample ID: **03MAR2012SW005**

SVL Sample ID: **W2C0178-06 (Surface Water)**

Sample Report Page 1 of 3

Sampled: 03-Mar-12 10:15
Received: 09-Mar-12
Sampled By: JM/GM

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W211099	DJA	03/14/12 17:14	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	0.948	mg/L	0.080	0.008		W211002	DT	03/23/12 10:17	
EPA 200.7	Barium	0.0146	mg/L	0.0020	0.0002		W211002	DT	03/23/12 10:17	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0002		W211002	DT	03/23/12 10:17	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W211002	DT	03/23/12 10:17	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0002		W211002	DT	03/23/12 10:17	
EPA 200.7	Calcium	1.55	mg/L	0.040	0.006		W211002	DT	03/23/12 10:17	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0003		W211002	DT	03/23/12 10:17	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W211002	DT	03/23/12 10:17	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.002		W211002	DT	03/23/12 10:17	
EPA 200.7	Iron	11.3	mg/L	0.060	0.008		W211002	DT	03/23/12 10:17	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0017		W211002	DT	03/23/12 10:17	
EPA 200.7	Magnesium	1.32	mg/L	0.060	0.010		W211002	DT	03/23/12 10:17	
EPA 200.7	Manganese	0.182	mg/L	0.0040	0.0006		W211002	DT	03/23/12 10:17	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.0006		W211002	DT	03/23/12 10:17	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W211002	DT	03/23/12 10:17	
EPA 200.7	Potassium	1.34	mg/L	0.50	0.03		W211002	DT	03/23/12 10:17	
EPA 200.7	Silicon	3.55	mg/L	0.08	0.01		W211002	DT	03/23/12 10:17	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0003		W211002	DT	03/23/12 10:17	
EPA 200.7	Sodium	3.25	mg/L	0.50	0.02		W211002	DT	03/23/12 10:17	
EPA 200.7	Titanium	0.0147	mg/L	0.0050	0.0002		W211002	DT	03/23/12 10:17	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0002		W211002	DT	03/23/12 10:17	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0010		W211002	DT	03/23/12 10:17	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W211005	KWH	03/15/12 13:43	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W211005	KWH	03/15/12 13:43	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W211005	KWH	03/15/12 13:43	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000004	2.5	W211005	KWH	03/15/12 13:43	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000006	2.5	W211005	KWH	03/15/12 13:43	
SM 2340B	Hardness(as CaCO3)	9.29	mg/L	0.347	0.058		N/A		03/23/12 10:17	



Tetra Tech EM, Inc. (Boise)
 3380 Americana Terrace, Suite 201
 Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: **W2C0178**

Reported: 26-Mar-12 13:05

Client Sample ID: **03MAR2012SW005**

Sampled: 03-Mar-12 10:15

SVL Sample ID: **W2C0178-06 (Surface Water)**

Received: 09-Mar-12

Sample Report Page 2 of 3

Sampled By: JM/GM

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.016		W211004	AS	03/25/12 12:29	
EPA 200.7	Barium	0.0112	mg/L	0.0020	0.0004		W211004	AS	03/25/12 12:29	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0004		W211004	AS	03/25/12 12:29	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W211004	AS	03/25/12 12:29	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W211004	AS	03/25/12 12:29	
EPA 200.7	Calcium	1.50	mg/L	0.040	0.012		W211004	AS	03/25/12 12:29	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W211004	AS	03/25/12 12:29	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W211004	AS	03/25/12 12:29	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.003		W211004	AS	03/25/12 12:29	
EPA 200.7	Iron	2.99	mg/L	0.060	0.017		W211004	AS	03/25/12 12:29	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0034		W211004	AS	03/25/12 12:29	
EPA 200.7	Magnesium	1.17	mg/L	0.060	0.021		W211004	AS	03/25/12 12:29	
EPA 200.7	Manganese	0.172	mg/L	0.0040	0.0011		W211004	AS	03/25/12 12:29	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W211004	AS	03/25/12 12:29	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W211004	AS	03/25/12 12:29	
EPA 200.7	Potassium	1.23	mg/L	0.50	0.07		W211004	AS	03/25/12 12:29	
EPA 200.7	Silicon	2.89	mg/L	0.08	0.03		W211004	AS	03/25/12 12:29	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0005		W211004	AS	03/25/12 12:29	
EPA 200.7	Sodium	3.13	mg/L	0.50	0.04		W211004	AS	03/25/12 12:29	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W211004	AS	03/25/12 12:29	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W211004	AS	03/25/12 12:29	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0021		W211004	AS	03/25/12 12:29	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W211010	KWH	03/20/12 06:23	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W211010	KWH	03/20/12 06:23	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W211010	KWH	03/20/12 06:23	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000033		W211010	KWH	03/20/12 06:23	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000049		W211010	KWH	03/20/12 06:23	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W211097	DJA	03/14/12 16:21	
Classical Chemistry Parameters										
ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0005		W210179	IIT	03/12/12 10:12	
EPA 120.1	Specific conductance	49.4	µmhos/cm	5.00			W211024	JMS	03/09/12 15:25	
EPA 180.1	Turbidity	115	NTU	0.300		3	W211056	SM	03/12/12 13:08	D2,H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W211255	IIT	03/15/12 12:26	
EPA 350.1	Ammonia as N	1.16	mg/L	0.030	0.006		W211301	RHW	03/19/12 13:31	
EPA 353.2	Nitrate/Nitrite as N	0.076	mg/L	0.050	0.009		W212176	RHW	03/23/12 09:15	
EPA 410.4	Chemical Oxygen Demand	18.7	mg/L	5.0	2.5		W211045	SM	03/13/12 10:05	
SM 2320B/2310B	Bicarbonate	9.7	mg/L	1.0	0.1		W211040	AGF	03/14/12 13:38	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.1		W211040	AGF	03/14/12 13:38	
SM 2320B/2310B	Total Alkalinity	9.7	mg/L	1.0	0.1		W211040	AGF	03/14/12 13:38	
SM 2540 C	Total Diss. Solids	32	mg/L	10			W210318	JMS	03/09/12 15:35	
SM 2540 D	Total Susp. Solids	33.0	mg/L	5.0			W210317	JMS	03/09/12 15:35	
SM 4500 H B	pH @21.0°C	6.55	pH Units				W211040	AGF	03/14/12 13:38	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W211256	IIT	03/15/12 13:34	
SM 4500-P-E	Phosphorus	0.010	mg/L	0.010	0.003		W211219	SM	03/15/12 15:36	
SM 5310B	Total Organic Carbon	5.73	mg/L	1.00	0.27		W211288	SM	03/19/12 19:05	



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

(208) 784-1258

Fax (208) 783-0891

Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: **W2C0178**

Reported: 26-Mar-12 13:05

Client Sample ID: **03MAR2012SW005**

SVL Sample ID: **W2C0178-06 (Surface Water)**

Sample Report Page 3 of 3

Sampled: 03-Mar-12 10:15

Received: 09-Mar-12

Sampled By: JM/GM

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	5.25	mg/L	0.20	0.07		W211338	AEW	03/16/12 15:01	
EPA 300.0	Fluoride	< 0.10	mg/L	0.10	0.02		W211338	AEW	03/16/12 15:01	
EPA 300.0	Sulfate as SO4	2.90	mg/L	0.30	0.04		W211338	AEW	03/16/12 15:01	

Cation/Anion Balance and TDS Ratios

Cation Sum: 0.54 meq/L Anion Sum: 0.41 meq/L C/A Balance: 13.53 % Calculated TDS: 30 TDS/cTDS: 1.06 TDS/eC: 0.65

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2C0178**
Reported: 26-Mar-12 13:05

Quality Control - BLANK Data

Method	Analyte	Units	Result	MDL	MRL	Batch ID	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	mg/L	<0.00020	0.000072	0.00020	W211099	14-Mar-12	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	mg/L	<0.080	0.008	0.080	W211002	23-Mar-12	
EPA 200.7	Barium	mg/L	<0.0020	0.0002	0.0020	W211002	23-Mar-12	
EPA 200.7	Beryllium	mg/L	<0.0020	0.0002	0.0020	W211002	23-Mar-12	
EPA 200.7	Boron	mg/L	<0.040	0.005	0.040	W211002	23-Mar-12	
EPA 200.7	Cadmium	mg/L	<0.0020	0.0002	0.0020	W211002	23-Mar-12	
EPA 200.7	Calcium	mg/L	<0.040	0.006	0.040	W211002	23-Mar-12	
EPA 200.7	Chromium	mg/L	<0.0060	0.0003	0.0060	W211002	23-Mar-12	
EPA 200.7	Cobalt	mg/L	<0.0060	0.0005	0.0060	W211002	23-Mar-12	
EPA 200.7	Copper	mg/L	<0.010	0.002	0.010	W211002	23-Mar-12	
EPA 200.7	Iron	mg/L	<0.060	0.008	0.060	W211002	23-Mar-12	
EPA 200.7	Lead	mg/L	<0.0075	0.0017	0.0075	W211002	23-Mar-12	
EPA 200.7	Magnesium	mg/L	<0.060	0.010	0.060	W211002	23-Mar-12	
EPA 200.7	Manganese	mg/L	<0.0040	0.0006	0.0040	W211002	23-Mar-12	
EPA 200.7	Molybdenum	mg/L	<0.008	0.0006	0.008	W211002	23-Mar-12	
EPA 200.7	Nickel	mg/L	<0.010	0.002	0.010	W211002	23-Mar-12	
EPA 200.7	Potassium	mg/L	<0.50	0.03	0.50	W211002	23-Mar-12	
EPA 200.7	Silicon	mg/L	<0.08	0.01	0.08	W211002	23-Mar-12	
EPA 200.7	Silver	mg/L	<0.0050	0.0003	0.0050	W211002	23-Mar-12	
EPA 200.7	Sodium	mg/L	<0.50	0.02	0.50	W211002	23-Mar-12	
EPA 200.7	Titanium	mg/L	<0.0050	0.0002	0.0050	W211002	23-Mar-12	
EPA 200.7	Vanadium	mg/L	<0.0050	0.0002	0.0050	W211002	23-Mar-12	
EPA 200.7	Zinc	mg/L	<0.0100	0.0010	0.0100	W211002	23-Mar-12	
EPA 200.8	Antimony	mg/L	<0.00300	0.00015	0.00300	W211005	15-Mar-12	
EPA 200.8	Arsenic	mg/L	<0.0030	0.0003	0.0030	W211005	15-Mar-12	
EPA 200.8	Selenium	mg/L	<0.00300	0.00028	0.00300	W211005	15-Mar-12	
EPA 200.8	Uranium	mg/L	<0.00100	0.000006	0.00100	W211005	15-Mar-12	
EPA 200.8	Thallium	mg/L	<0.00100	0.000004	0.00100	W211005	15-Mar-12	

Metals (Dissolved)

EPA 200.7	Aluminum	mg/L	<0.080	0.016	0.080	W211004	25-Mar-12	
EPA 200.7	Barium	mg/L	<0.0020	0.0004	0.0020	W211004	25-Mar-12	
EPA 200.7	Beryllium	mg/L	<0.0020	0.0004	0.0020	W211004	25-Mar-12	
EPA 200.7	Boron	mg/L	<0.040	0.010	0.040	W211004	25-Mar-12	
EPA 200.7	Cadmium	mg/L	<0.0020	0.0005	0.0020	W211004	25-Mar-12	
EPA 200.7	Calcium	mg/L	<0.040	0.012	0.040	W211004	25-Mar-12	
EPA 200.7	Chromium	mg/L	<0.0060	0.0006	0.0060	W211004	25-Mar-12	
EPA 200.7	Cobalt	mg/L	<0.0060	0.0009	0.0060	W211004	25-Mar-12	
EPA 200.7	Copper	mg/L	<0.010	0.003	0.010	W211004	25-Mar-12	
EPA 200.7	Iron	mg/L	<0.060	0.017	0.060	W211004	25-Mar-12	
EPA 200.7	Lead	mg/L	<0.0075	0.0034	0.0075	W211004	25-Mar-12	
EPA 200.7	Magnesium	mg/L	<0.060	0.021	0.060	W211004	25-Mar-12	
EPA 200.7	Manganese	mg/L	<0.0040	0.0011	0.0040	W211004	25-Mar-12	
EPA 200.7	Molybdenum	mg/L	<0.008	0.001	0.008	W211004	25-Mar-12	
EPA 200.7	Nickel	mg/L	<0.010	0.003	0.010	W211004	25-Mar-12	
EPA 200.7	Potassium	mg/L	<0.50	0.07	0.50	W211004	25-Mar-12	
EPA 200.7	Silicon	mg/L	<0.08	0.03	0.08	W211004	25-Mar-12	
EPA 200.7	Silver	mg/L	<0.0050	0.0005	0.0050	W211004	25-Mar-12	
EPA 200.7	Sodium	mg/L	<0.50	0.04	0.50	W211004	25-Mar-12	
EPA 200.7	Titanium	mg/L	<0.0050	0.0003	0.0050	W211004	25-Mar-12	
EPA 200.7	Vanadium	mg/L	<0.0050	0.0005	0.0050	W211004	25-Mar-12	
EPA 200.7	Zinc	mg/L	<0.0100	0.0021	0.0100	W211004	25-Mar-12	
EPA 200.8	Antimony	mg/L	<0.00300	0.00012	0.00300	W211010	20-Mar-12	
EPA 200.8	Arsenic	mg/L	<0.0030	0.0002	0.0030	W211010	20-Mar-12	
EPA 200.8	Selenium	mg/L	<0.00300	0.00022	0.00300	W211010	20-Mar-12	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



Tetra Tech EM, Inc. (Boise)
 3380 Americana Terrace, Suite 201
 Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
 Work Order: **W2C0178**
 Reported: 26-Mar-12 13:05

Quality Control - BLANK Data (Continued)

Method	Analyte	Units	Result	MDL	MRL	Batch ID	Analyzed	Notes
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Metals (Dissolved) (Continued)

EPA 200.8	Thallium	mg/L	<0.00100	0.0000033	0.00100	W211010	20-Mar-12	
EPA 200.8	Uranium	mg/L	<0.00100	0.0000049	0.00100	W211010	20-Mar-12	
EPA 245.1	Mercury	mg/L	<0.00020	0.000072	0.00020	W211097	14-Mar-12	
EPA 245.1	Mercury	mg/L	<0.00020	0.000072	0.00020	W211273	15-Mar-12	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	mg/L	<0.005	0.0005	0.005	W210179	12-Mar-12	
EPA 120.1	Specific conductance	µmhos/cm	<5.00		5.00	W211024	09-Mar-12	
EPA 180.1	Turbidity	NTU	<0.100		0.100	W211056	12-Mar-12	
EPA 335.4	Cyanide (total)	mg/L	<0.0100	0.0021	0.0100	W211255	15-Mar-12	
EPA 350.1	Ammonia as N	mg/L	<0.030	0.006	0.030	W211301	19-Mar-12	
EPA 353.2	Nitrate/Nitrite as N	mg/L	<0.050	0.009	0.050	W212176	23-Mar-12	
EPA 410.4	Chemical Oxygen Demand	mg/L	<5.0	2.5	5.0	W211045	13-Mar-12	
SM 2540 C	Total Diss. Solids	mg/L	<10		10	W210318	09-Mar-12	
SM 2540 D	Total Susp. Solids	mg/L	<5.0		5.0	W210317	09-Mar-12	
SM 2540 D	Total Susp. Solids	mg/L	<5.0		5.0	W210317	12-Mar-12	
SM 4500-CN-I	Cyanide (WAD)	mg/L	<0.0100	0.0006	0.0100	W211256	15-Mar-12	
SM 4500-P-E	Phosphorus	mg/L	<0.010	0.003	0.010	W211219	15-Mar-12	
SM 5310B	Total Organic Carbon	mg/L	<1.00	0.27	1.00	W211288	19-Mar-12	

Anions by Ion Chromatography

EPA 300.0	Fluoride	mg/L	<0.10	0.02	0.10	W211338	16-Mar-12	
EPA 300.0	Chloride	mg/L	<0.20	0.07	0.20	W211338	16-Mar-12	
EPA 300.0	Sulfate as SO4	mg/L	<0.30	0.04	0.30	W211338	16-Mar-12	

Quality Control - LABORATORY CONTROL SAMPLE Data

Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	mg/L	0.00502	0.00500	100	85 - 115	W211099	14-Mar-12	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	mg/L	1.04	1.00	104	85 - 115	W211002	23-Mar-12	
EPA 200.7	Barium	mg/L	1.05	1.00	105	85 - 115	W211002	23-Mar-12	
EPA 200.7	Beryllium	mg/L	0.991	1.00	99.1	85 - 115	W211002	23-Mar-12	
EPA 200.7	Boron	mg/L	1.04	1.00	104	85 - 115	W211002	23-Mar-12	
EPA 200.7	Cadmium	mg/L	1.05	1.00	105	85 - 115	W211002	23-Mar-12	
EPA 200.7	Calcium	mg/L	20.5	20.0	102	85 - 115	W211002	23-Mar-12	
EPA 200.7	Chromium	mg/L	1.06	1.00	106	85 - 115	W211002	23-Mar-12	
EPA 200.7	Cobalt	mg/L	1.08	1.00	108	85 - 115	W211002	23-Mar-12	
EPA 200.7	Copper	mg/L	1.07	1.00	107	85 - 115	W211002	23-Mar-12	
EPA 200.7	Iron	mg/L	10.1	10.0	101	85 - 115	W211002	23-Mar-12	
EPA 200.7	Lead	mg/L	1.06	1.00	106	85 - 115	W211002	23-Mar-12	
EPA 200.7	Magnesium	mg/L	20.7	20.0	104	85 - 115	W211002	23-Mar-12	
EPA 200.7	Manganese	mg/L	1.02	1.00	102	85 - 115	W211002	23-Mar-12	
EPA 200.7	Molybdenum	mg/L	1.05	1.00	105	85 - 115	W211002	23-Mar-12	
EPA 200.7	Nickel	mg/L	1.08	1.00	108	85 - 115	W211002	23-Mar-12	
EPA 200.7	Potassium	mg/L	20.7	20.0	104	85 - 115	W211002	23-Mar-12	
EPA 200.7	Silicon	mg/L	4.99	5.00	99.7	85 - 115	W211002	23-Mar-12	
EPA 200.7	Silver	mg/L	0.0543	0.0500	109	85 - 115	W211002	23-Mar-12	
EPA 200.7	Sodium	mg/L	19.1	19.0	101	85 - 115	W211002	23-Mar-12	
EPA 200.7	Titanium	mg/L	1.06	1.00	106	85 - 115	W211002	23-Mar-12	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245Work Order: **W2C0178**

Reported: 26-Mar-12 13:05

Quality Control - LABORATORY CONTROL SAMPLE Data (Continued)									
Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes

Metals (Total Recoverable--reportable as Total per 40 CFR 136) (Continued)

EPA 200.7	Vanadium	mg/L	1.04	1.00	104	85 - 115	W211002	23-Mar-12	
EPA 200.7	Zinc	mg/L	1.03	1.00	103	85 - 115	W211002	23-Mar-12	
EPA 200.8	Antimony	mg/L	0.0288	0.0250	115	85 - 115	W211005	15-Mar-12	
EPA 200.8	Arsenic	mg/L	0.0258	0.0250	103	85 - 115	W211005	15-Mar-12	
EPA 200.8	Selenium	mg/L	0.0250	0.0250	100	85 - 115	W211005	15-Mar-12	
EPA 200.8	Uranium	mg/L	0.0271	0.0250	109	85 - 115	W211005	15-Mar-12	
EPA 200.8	Thallium	mg/L	0.0263	0.0250	105	85 - 115	W211005	15-Mar-12	

Metals (Dissolved)

EPA 200.7	Aluminum	mg/L	1.02	1.00	102	85 - 115	W211004	25-Mar-12	
EPA 200.7	Barium	mg/L	1.04	1.00	104	85 - 115	W211004	25-Mar-12	
EPA 200.7	Beryllium	mg/L	0.980	1.00	98.0	85 - 115	W211004	25-Mar-12	
EPA 200.7	Boron	mg/L	1.03	1.00	103	85 - 115	W211004	25-Mar-12	
EPA 200.7	Cadmium	mg/L	1.02	1.00	102	85 - 115	W211004	25-Mar-12	
EPA 200.7	Calcium	mg/L	20.3	20.0	101	85 - 115	W211004	25-Mar-12	
EPA 200.7	Chromium	mg/L	1.02	1.00	102	85 - 115	W211004	25-Mar-12	
EPA 200.7	Cobalt	mg/L	1.01	1.00	101	85 - 115	W211004	25-Mar-12	
EPA 200.7	Copper	mg/L	0.991	1.00	99.1	85 - 115	W211004	25-Mar-12	
EPA 200.7	Iron	mg/L	10.0	10.0	100	85 - 115	W211004	25-Mar-12	
EPA 200.7	Lead	mg/L	1.01	1.00	101	85 - 115	W211004	25-Mar-12	
EPA 200.7	Magnesium	mg/L	19.9	20.0	99.3	85 - 115	W211004	25-Mar-12	
EPA 200.7	Manganese	mg/L	0.996	1.00	99.6	85 - 115	W211004	25-Mar-12	
EPA 200.7	Molybdenum	mg/L	1.02	1.00	102	85 - 115	W211004	25-Mar-12	
EPA 200.7	Nickel	mg/L	0.982	1.00	98.2	85 - 115	W211004	25-Mar-12	
EPA 200.7	Potassium	mg/L	20.2	20.0	101	85 - 115	W211004	25-Mar-12	
EPA 200.7	Silicon	mg/L	4.85	5.00	97.0	85 - 115	W211004	25-Mar-12	
EPA 200.7	Silver	mg/L	0.0515	0.0500	103	85 - 115	W211004	25-Mar-12	
EPA 200.7	Sodium	mg/L	19.0	19.0	99.8	85 - 115	W211004	25-Mar-12	
EPA 200.7	Titanium	mg/L	1.00	1.00	100	85 - 115	W211004	25-Mar-12	
EPA 200.7	Vanadium	mg/L	1.01	1.00	101	85 - 115	W211004	25-Mar-12	
EPA 200.7	Zinc	mg/L	1.01	1.00	101	85 - 115	W211004	25-Mar-12	
EPA 200.8	Antimony	mg/L	0.0258	0.0250	103	85 - 115	W211010	20-Mar-12	
EPA 200.8	Arsenic	mg/L	0.0251	0.0250	101	85 - 115	W211010	20-Mar-12	
EPA 200.8	Selenium	mg/L	0.0262	0.0250	105	85 - 115	W211010	20-Mar-12	
EPA 200.8	Thallium	mg/L	0.0248	0.0250	99.1	85 - 115	W211010	20-Mar-12	
EPA 200.8	Uranium	mg/L	0.0259	0.0250	104	85 - 115	W211010	20-Mar-12	
EPA 245.1	Mercury	mg/L	0.00488	0.00500	97.6	85 - 115	W211097	14-Mar-12	
EPA 245.1	Mercury	mg/L	0.00482	0.00500	96.4	85 - 115	W211273	15-Mar-12	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	mg/L	0.149	0.150	99.3	85 - 115	W210179	12-Mar-12	
EPA 120.1	Specific conductance	µmhos/cm	421	421	100	90 - 110	W211024	09-Mar-12	
EPA 180.1	Turbidity	NTU	4.29	4.39	97.7	90 - 110	W211056	12-Mar-12	
EPA 335.4	Cyanide (total)	mg/L	0.152	0.150	101	90 - 110	W211255	15-Mar-12	
EPA 350.1	Ammonia as N	mg/L	0.728	0.750	97.0	90 - 110	W211301	19-Mar-12	
EPA 353.2	Nitrate/Nitrite as N	mg/L	1.98	2.00	99.0	90 - 110	W212176	23-Mar-12	
EPA 410.4	Chemical Oxygen Demand	mg/L	111	113	97.8	90 - 110	W211045	13-Mar-12	
SM 4500-CN-I	Cyanide (WAD)	mg/L	0.150	0.150	100	90 - 110	W211256	15-Mar-12	
SM 4500-P-E	Phosphorus	mg/L	0.919	0.877	105	90 - 110	W211219	15-Mar-12	
SM 5310B	Total Organic Carbon	mg/L	64.0	66.7	96.0	80 - 120	W211288	19-Mar-12	

Anions by Ion Chromatography

EPA 300.0	Fluoride	mg/L	1.96	2.00	98.2	90 - 110	W211338	16-Mar-12	
EPA 300.0	Chloride	mg/L	3.01	3.00	100	90 - 110	W211338	16-Mar-12	
EPA 300.0	Sulfate as SO4	mg/L	10.7	10.0	107	90 - 110	W211338	16-Mar-12	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268

Work order Report Page 22 of 28



Tetra Tech EM, Inc. (Boise)
 3380 Americana Terrace, Suite 201
 Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
 Work Order: **W2C0178**
 Reported: 26-Mar-12 13:05

Quality Control - DUPLICATE Data

Method	Analyte	Units	Duplicate Result	Sample Result	RPD	RPD Limit	Batch ID	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	mg/L	<0.00020	<0.00020	UDL	20	W211099	14-Mar-12	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	mg/L	0.638	0.650	1.9	20	W211002	23-Mar-12	
EPA 200.7	Barium	mg/L	0.0086	0.0087	1.2	20	W211002	23-Mar-12	
EPA 200.7	Beryllium	mg/L	<0.0020	<0.0020	UDL	20	W211002	23-Mar-12	
EPA 200.7	Boron	mg/L	<0.040	<0.040	<RL	20	W211002	23-Mar-12	
EPA 200.7	Cadmium	mg/L	<0.0020	<0.0020	UDL	20	W211002	23-Mar-12	
EPA 200.7	Calcium	mg/L	1.17	1.19	1.6	20	W211002	23-Mar-12	
EPA 200.7	Chromium	mg/L	<0.0060	<0.0060	<RL	20	W211002	23-Mar-12	
EPA 200.7	Cobalt	mg/L	<0.0060	<0.0060	UDL	20	W211002	23-Mar-12	
EPA 200.7	Copper	mg/L	<0.010	<0.010	<RL	20	W211002	23-Mar-12	
EPA 200.7	Iron	mg/L	6.23	6.29	1.0	20	W211002	23-Mar-12	
EPA 200.7	Lead	mg/L	<0.0075	<0.0075	UDL	20	W211002	23-Mar-12	
EPA 200.7	Magnesium	mg/L	0.954	0.968	1.4	20	W211002	23-Mar-12	
EPA 200.7	Manganese	mg/L	0.0283	0.0289	2.0	20	W211002	23-Mar-12	
EPA 200.7	Molybdenum	mg/L	<0.008	<0.008	UDL	20	W211002	23-Mar-12	
EPA 200.7	Nickel	mg/L	<0.010	<0.010	UDL	20	W211002	23-Mar-12	
EPA 200.7	Potassium	mg/L	0.86	0.88	1.8	20	W211002	23-Mar-12	
EPA 200.7	Silicon	mg/L	2.66	2.70	1.4	20	W211002	23-Mar-12	
EPA 200.7	Silver	mg/L	<0.0050	<0.0050	UDL	20	W211002	23-Mar-12	
EPA 200.7	Sodium	mg/L	2.49	2.51	0.9	20	W211002	23-Mar-12	
EPA 200.7	Titanium	mg/L	0.0070	0.0069	2.6	20	W211002	23-Mar-12	
EPA 200.7	Vanadium	mg/L	<0.0050	<0.0050	<RL	20	W211002	23-Mar-12	
EPA 200.7	Zinc	mg/L	<0.0100	<0.0100	<RL	20	W211002	23-Mar-12	
EPA 200.8	Antimony	mg/L	<0.00300	<0.00300	UDL	20	W211005	15-Mar-12	
EPA 200.8	Arsenic	mg/L	<0.0030	<0.0030	<RL	20	W211005	15-Mar-12	
EPA 200.8	Selenium	mg/L	<0.00300	<0.00300	UDL	20	W211005	15-Mar-12	
EPA 200.8	Uranium	mg/L	<0.00100	<0.00100	<RL	20	W211005	15-Mar-12	
EPA 200.8	Thallium	mg/L	<0.00100	<0.00100	<RL	20	W211005	15-Mar-12	

Metals (Dissolved)

EPA 200.7	Aluminum	mg/L	0.081	0.086	5.5	20	W211004	25-Mar-12	
EPA 200.7	Barium	mg/L	0.0127	0.0131	3.5	20	W211004	25-Mar-12	
EPA 200.7	Beryllium	mg/L	<0.0020	<0.0020	UDL	20	W211004	25-Mar-12	
EPA 200.7	Boron	mg/L	<0.040	<0.040	UDL	20	W211004	25-Mar-12	
EPA 200.7	Cadmium	mg/L	<0.0020	<0.0020	UDL	20	W211004	25-Mar-12	
EPA 200.7	Calcium	mg/L	370	377	2.0	20	W211004	25-Mar-12	
EPA 200.7	Chromium	mg/L	<0.0060	<0.0060	<RL	20	W211004	25-Mar-12	
EPA 200.7	Cobalt	mg/L	<0.0060	<0.0060	UDL	20	W211004	25-Mar-12	
EPA 200.7	Copper	mg/L	<0.010	<0.010	UDL	20	W211004	25-Mar-12	
EPA 200.7	Iron	mg/L	<0.060	<0.060	UDL	20	W211004	25-Mar-12	
EPA 200.7	Lead	mg/L	<0.0075	<0.0075	<RL	20	W211004	25-Mar-12	
EPA 200.7	Magnesium	mg/L	0.068	0.064	6.2	20	W211004	25-Mar-12	
EPA 200.7	Manganese	mg/L	<0.0040	<0.0040	UDL	20	W211004	25-Mar-12	
EPA 200.7	Molybdenum	mg/L	0.340	0.351	3.1	20	W211004	25-Mar-12	
EPA 200.7	Nickel	mg/L	<0.010	<0.010	UDL	20	W211004	25-Mar-12	
EPA 200.7	Potassium	mg/L	9.13	9.30	1.9	20	W211004	25-Mar-12	
EPA 200.7	Silicon	mg/L	1.41	1.45	2.6	20	W211004	25-Mar-12	
EPA 200.7	Silver	mg/L	<0.0050	<0.0050	UDL	20	W211004	25-Mar-12	
EPA 200.7	Sodium	mg/L	12.5	12.8	2.4	20	W211004	25-Mar-12	
EPA 200.7	Titanium	mg/L	<0.0050	<0.0050	UDL	20	W211004	25-Mar-12	
EPA 200.7	Vanadium	mg/L	<0.0050	<0.0050	<RL	20	W211004	25-Mar-12	
EPA 200.7	Zinc	mg/L	<0.0100	<0.0100	UDL	20	W211004	25-Mar-12	
EPA 200.8	Antimony	mg/L	<0.00300	<0.00300	<RL	20	W211010	20-Mar-12	
EPA 200.8	Arsenic	mg/L	<0.0030	0.0034	<RL	20	W211010	20-Mar-12	
EPA 200.8	Selenium	mg/L	0.0293	0.0296	1.1	20	W211010	20-Mar-12	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: **Suriname Merian 2012 / 113-93245**

Work Order: **W2C0178**

Reported: 26-Mar-12 13:05

Quality Control - DUPLICATE Data (Continued)

Method	Analyte	Units	Duplicate Result	Sample Result	RPD	RPD Limit	Batch ID	Analyzed	Notes
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Metals (Dissolved) (Continued)

EPA 200.8	Thallium	mg/L	<0.00100	<0.00100	<RL	20	W211010	20-Mar-12	
EPA 200.8	Uranium	mg/L	<0.00100	<0.00100	UDL	20	W211010	20-Mar-12	
EPA 245.1	Mercury	mg/L	<0.00020	<0.00020	UDL	20	W211097	14-Mar-12	

Classical Chemistry Parameters

EPA 120.1	Specific conductance	µmhos/cm	29.4	28.6	2.7	20	W211024	09-Mar-12	
EPA 180.1	Turbidity	NTU	815	745	9.0	20	W211056	12-Mar-12	D2
EPA 335.4	Cyanide (total)	mg/L	<0.0100	<0.0100	UDL	20	W211255	15-Mar-12	
EPA 350.1	Ammonia as N	mg/L	0.239	0.235	1.7	20	W211301	19-Mar-12	
EPA 353.2	Nitrate/Nitrite as N	mg/L	2.50	2.50	0.1	20	W212176	23-Mar-12	
EPA 410.4	Chemical Oxygen Demand	mg/L	10.0	10.1	1.2	20	W211045	13-Mar-12	
SM 2320B/2310B	Total Alkalinity	mg/L	142	140	1.8	20	W211040	13-Mar-12	
SM 2320B/2310B	Total Alkalinity	mg/L	155	154	0.5	20	W211040	13-Mar-12	
SM 2320B/2310B	Bicarbonate	mg/L	142	140	1.8	20	W211040	13-Mar-12	
SM 2320B/2310B	Bicarbonate	mg/L	155	154	0.5	20	W211040	13-Mar-12	
SM 2320B/2310B	Carbonate	mg/L	<1.0	<1.0	UDL	20	W211040	13-Mar-12	
SM 2320B/2310B	Carbonate	mg/L	<1.0	<1.0	UDL	20	W211040	13-Mar-12	
SM 2540 C	Total Diss. Solids	mg/L	69	39	55.6	10	W210318	09-Mar-12	R1
SM 2540 D	Total Susp. Solids	mg/L	908	896	1.3	10	W210317	12-Mar-12	
SM 4500 H B	pH	pH Units	7.89	7.93	0.5	20	W211040	13-Mar-12	
SM 4500 H B	pH	pH Units	8.30	8.24	0.7	20	W211040	13-Mar-12	
SM 4500-CN-I	Cyanide (WAD)	mg/L	<0.0100	<0.0100	UDL	20	W211256	15-Mar-12	
SM 4500-P-E	Phosphorus	mg/L	0.016	0.014	16.5	20	W211219	15-Mar-12	
SM 5310B	Total Organic Carbon	mg/L	6.33	6.10	3.7	20	W211288	19-Mar-12	

Anions by Ion Chromatography

EPA 300.0	Fluoride	mg/L	0.34	0.31	6.6	20	W211338	16-Mar-12	
EPA 300.0	Chloride	mg/L	0.81	0.80	0.8	20	W211338	16-Mar-12	
EPA 300.0	Sulfate as SO4	mg/L	1.41	1.44	1.9	20	W211338	16-Mar-12	

Quality Control - MATRIX SPIKE Data

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	mg/L	0.00104	<0.00020	0.000990	105	70 - 130	W211099	14-Mar-12	
EPA 245.1	Mercury	mg/L	0.00103	<0.00020	0.000990	104	70 - 130	W211099	14-Mar-12	

Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	mg/L	5.01	0.650	1.00	436	70 - 130	W211002	23-Mar-12	M1
EPA 200.7	Aluminum	mg/L	1.50	0.250	1.00	125	70 - 130	W211002	23-Mar-12	
EPA 200.7	Barium	mg/L	1.09	0.0087	1.00	109	70 - 130	W211002	23-Mar-12	
EPA 200.7	Barium	mg/L	1.18	0.114	1.00	106	70 - 130	W211002	23-Mar-12	
EPA 200.7	Beryllium	mg/L	1.02	<0.0020	1.00	102	70 - 130	W211002	23-Mar-12	
EPA 200.7	Beryllium	mg/L	1.01	<0.0020	1.00	101	70 - 130	W211002	23-Mar-12	
EPA 200.7	Boron	mg/L	1.09	<0.040	1.00	108	70 - 130	W211002	23-Mar-12	
EPA 200.7	Boron	mg/L	1.17	0.085	1.00	109	70 - 130	W211002	23-Mar-12	
EPA 200.7	Cadmium	mg/L	1.06	<0.0020	1.00	106	70 - 130	W211002	23-Mar-12	
EPA 200.7	Cadmium	mg/L	1.05	<0.0020	1.00	105	70 - 130	W211002	23-Mar-12	
EPA 200.7	Calcium	mg/L	21.9	1.19	20.0	104	70 - 130	W211002	23-Mar-12	
EPA 200.7	Calcium	mg/L	87.9	66.5	20.0	107	70 - 130	W211002	23-Mar-12	
EPA 200.7	Chromium	mg/L	1.09	<0.0060	1.00	108	70 - 130	W211002	23-Mar-12	
EPA 200.7	Chromium	mg/L	1.07	<0.0060	1.00	107	70 - 130	W211002	23-Mar-12	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



Tetra Tech EM, Inc. (Boise)
 3380 Americana Terrace, Suite 201
 Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
 Work Order: **W2C0178**
 Reported: 26-Mar-12 13:05

Quality Control - MATRIX SPIKE Data (Continued)

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Total Recoverable--reportable as Total per 40 CFR 136) (Continued)

EPA 200.7	Cobalt	mg/L	1.11	<0.0060	1.00	111	70 - 130	W211002	23-Mar-12	
EPA 200.7	Cobalt	mg/L	1.11	<0.0060	1.00	111	70 - 130	W211002	23-Mar-12	
EPA 200.7	Copper	mg/L	1.12	<0.010	1.00	111	70 - 130	W211002	23-Mar-12	
EPA 200.7	Copper	mg/L	1.14	<0.010	1.00	114	70 - 130	W211002	23-Mar-12	
EPA 200.7	Iron	mg/L	18.1	6.29	10.0	118	70 - 130	W211002	23-Mar-12	
EPA 200.7	Iron	mg/L	10.7	0.201	10.0	105	70 - 130	W211002	23-Mar-12	
EPA 200.7	Lead	mg/L	1.08	<0.0075	1.00	108	70 - 130	W211002	23-Mar-12	
EPA 200.7	Lead	mg/L	1.10	<0.0075	1.00	109	70 - 130	W211002	23-Mar-12	
EPA 200.7	Magnesium	mg/L	21.9	0.968	20.0	105	70 - 130	W211002	23-Mar-12	
EPA 200.7	Magnesium	mg/L	42.5	21.0	20.0	108	70 - 130	W211002	23-Mar-12	
EPA 200.7	Manganese	mg/L	1.08	0.0289	1.00	105	70 - 130	W211002	23-Mar-12	
EPA 200.7	Manganese	mg/L	1.05	0.0048	1.00	104	70 - 130	W211002	23-Mar-12	
EPA 200.7	Molybdenum	mg/L	1.08	<0.008	1.00	108	70 - 130	W211002	23-Mar-12	
EPA 200.7	Molybdenum	mg/L	1.09	<0.008	1.00	108	70 - 130	W211002	23-Mar-12	
EPA 200.7	Nickel	mg/L	1.11	<0.010	1.00	111	70 - 130	W211002	23-Mar-12	
EPA 200.7	Nickel	mg/L	1.13	<0.010	1.00	113	70 - 130	W211002	23-Mar-12	
EPA 200.7	Potassium	mg/L	22.2	0.88	20.0	106	70 - 130	W211002	23-Mar-12	
EPA 200.7	Potassium	mg/L	24.4	2.81	20.0	108	70 - 130	W211002	23-Mar-12	
EPA 200.7	Silicon	mg/L	11.3	2.70	5.00	171	70 - 130	W211002	23-Mar-12	M1
EPA 200.7	Silicon	mg/L	13.2	7.64	5.00	111	70 - 130	W211002	23-Mar-12	
EPA 200.7	Silver	mg/L	0.0556	<0.0050	0.0500	111	70 - 130	W211002	23-Mar-12	
EPA 200.7	Silver	mg/L	0.0567	<0.0050	0.0500	113	70 - 130	W211002	23-Mar-12	
EPA 200.7	Sodium	mg/L	22.0	2.51	19.0	102	70 - 130	W211002	23-Mar-12	
EPA 200.7	Sodium	mg/L	40.7	20.8	19.0	105	70 - 130	W211002	23-Mar-12	
EPA 200.7	Titanium	mg/L	1.11	0.0069	1.00	110	70 - 130	W211002	23-Mar-12	
EPA 200.7	Titanium	mg/L	1.09	<0.0050	1.00	109	70 - 130	W211002	23-Mar-12	
EPA 200.7	Vanadium	mg/L	1.06	<0.0050	1.00	106	70 - 130	W211002	23-Mar-12	
EPA 200.7	Vanadium	mg/L	1.04	<0.0050	1.00	104	70 - 130	W211002	23-Mar-12	
EPA 200.7	Zinc	mg/L	1.04	<0.0100	1.00	104	70 - 130	W211002	23-Mar-12	
EPA 200.7	Zinc	mg/L	1.00	<0.0100	1.00	100	70 - 130	W211002	23-Mar-12	
EPA 200.8	Antimony	mg/L	0.0203	<0.00300	0.0250	81.2	70 - 130	W211005	15-Mar-12	
EPA 200.8	Antimony	mg/L	0.0246	<0.00300	0.0250	98.3	70 - 130	W211005	15-Mar-12	
EPA 200.8	Arsenic	mg/L	0.0217	<0.0030	0.0250	83.2	70 - 130	W211005	15-Mar-12	
EPA 200.8	Arsenic	mg/L	0.0224	<0.0030	0.0250	89.5	70 - 130	W211005	15-Mar-12	
EPA 200.8	Selenium	mg/L	0.0141	<0.00300	0.0250	56.4	70 - 130	W211005	15-Mar-12	M2
EPA 200.8	Selenium	mg/L	0.0198	<0.00300	0.0250	79.1	70 - 130	W211005	15-Mar-12	
EPA 200.8	Uranium	mg/L	0.0260	<0.00100	0.0250	104	70 - 130	W211005	15-Mar-12	
EPA 200.8	Uranium	mg/L	0.0254	<0.00100	0.0250	101	70 - 130	W211005	15-Mar-12	
EPA 200.8	Thallium	mg/L	0.0253	<0.00100	0.0250	101	70 - 130	W211005	15-Mar-12	
EPA 200.8	Thallium	mg/L	0.0247	<0.00100	0.0250	98.7	70 - 130	W211005	15-Mar-12	

Metals (Dissolved)

EPA 200.7	Aluminum	mg/L	1.16	0.086	1.00	107	70 - 130	W211004	25-Mar-12	
EPA 200.7	Aluminum	mg/L	0.983	<0.080	1.00	98.3	70 - 130	W211004	25-Mar-12	
EPA 200.7	Barium	mg/L	1.05	0.0131	1.00	104	70 - 130	W211004	25-Mar-12	
EPA 200.7	Barium	mg/L	0.980	0.0086	1.00	97.2	70 - 130	W211004	25-Mar-12	
EPA 200.7	Beryllium	mg/L	0.970	<0.0020	1.00	97.0	70 - 130	W211004	25-Mar-12	
EPA 200.7	Beryllium	mg/L	0.915	<0.0020	1.00	91.5	70 - 130	W211004	25-Mar-12	
EPA 200.7	Boron	mg/L	1.08	<0.040	1.00	108	70 - 130	W211004	25-Mar-12	
EPA 200.7	Boron	mg/L	1.07	0.087	1.00	98.8	70 - 130	W211004	25-Mar-12	
EPA 200.7	Cadmium	mg/L	1.00	<0.0020	1.00	100	70 - 130	W211004	25-Mar-12	
EPA 200.7	Cadmium	mg/L	0.957	<0.0020	1.00	95.7	70 - 130	W211004	25-Mar-12	
EPA 200.7	Calcium	mg/L	391	377	20.0	70.3	70 - 130	W211004	25-Mar-12	M3
EPA 200.7	Calcium	mg/L	123	100	20.0	111	70 - 130	W211004	25-Mar-12	M3
EPA 200.7	Chromium	mg/L	1.01	<0.0060	1.00	101	70 - 130	W211004	25-Mar-12	
EPA 200.7	Chromium	mg/L	0.959	<0.0060	1.00	95.9	70 - 130	W211004	25-Mar-12	
EPA 200.7	Cobalt	mg/L	1.03	<0.0060	1.00	103	70 - 130	W211004	25-Mar-12	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2C0178**
Reported: 26-Mar-12 13:05

Quality Control - MATRIX SPIKE Data (Continued)

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Dissolved) (Continued)

EPA 200.7	Cobalt	mg/L	0.957	<0.0060	1.00	95.7	70 - 130	W211004	25-Mar-12	
EPA 200.7	Copper	mg/L	1.10	<0.010	1.00	110	70 - 130	W211004	25-Mar-12	
EPA 200.7	Copper	mg/L	0.965	<0.010	1.00	96.5	70 - 130	W211004	25-Mar-12	
EPA 200.7	Iron	mg/L	10.0	<0.060	10.0	100	70 - 130	W211004	25-Mar-12	
EPA 200.7	Iron	mg/L	9.33	<0.060	10.0	93.3	70 - 130	W211004	25-Mar-12	
EPA 200.7	Lead	mg/L	1.07	<0.0075	1.00	106	70 - 130	W211004	25-Mar-12	
EPA 200.7	Lead	mg/L	0.984	<0.0075	1.00	98.0	70 - 130	W211004	25-Mar-12	
EPA 200.7	Magnesium	mg/L	20.7	0.064	20.0	103	70 - 130	W211004	25-Mar-12	
EPA 200.7	Magnesium	mg/L	46.8	27.2	20.0	98.3	70 - 130	W211004	25-Mar-12	
EPA 200.7	Manganese	mg/L	1.01	<0.0040	1.00	101	70 - 130	W211004	25-Mar-12	
EPA 200.7	Manganese	mg/L	0.958	<0.0040	1.00	95.8	70 - 130	W211004	25-Mar-12	
EPA 200.7	Molybdenum	mg/L	1.36	0.351	1.00	101	70 - 130	W211004	25-Mar-12	
EPA 200.7	Molybdenum	mg/L	0.967	0.012	1.00	95.5	70 - 130	W211004	25-Mar-12	
EPA 200.7	Nickel	mg/L	1.05	<0.010	1.00	105	70 - 130	W211004	25-Mar-12	
EPA 200.7	Nickel	mg/L	0.954	<0.010	1.00	95.4	70 - 130	W211004	25-Mar-12	
EPA 200.7	Potassium	mg/L	31.1	9.30	20.0	109	70 - 130	W211004	25-Mar-12	
EPA 200.7	Potassium	mg/L	20.4	0.75	20.0	98.2	70 - 130	W211004	25-Mar-12	
EPA 200.7	Silicon	mg/L	6.47	1.45	5.00	101	70 - 130	W211004	25-Mar-12	
EPA 200.7	Silicon	mg/L	13.9	9.27	5.00	93.1	70 - 130	W211004	25-Mar-12	
EPA 200.7	Silver	mg/L	0.0467	<0.0050	0.0500	93.4	70 - 130	W211004	25-Mar-12	
EPA 200.7	Silver	mg/L	0.0487	<0.0050	0.0500	97.5	70 - 130	W211004	25-Mar-12	
EPA 200.7	Sodium	mg/L	33.0	12.8	19.0	106	70 - 130	W211004	25-Mar-12	
EPA 200.7	Sodium	mg/L	52.1	32.9	19.0	101	70 - 130	W211004	25-Mar-12	
EPA 200.7	Titanium	mg/L	1.03	<0.0050	1.00	103	70 - 130	W211004	25-Mar-12	
EPA 200.7	Titanium	mg/L	0.959	<0.0050	1.00	95.9	70 - 130	W211004	25-Mar-12	
EPA 200.7	Vanadium	mg/L	1.03	<0.0050	1.00	103	70 - 130	W211004	25-Mar-12	
EPA 200.7	Vanadium	mg/L	0.971	<0.0050	1.00	96.9	70 - 130	W211004	25-Mar-12	
EPA 200.7	Zinc	mg/L	0.973	<0.0100	1.00	97.3	70 - 130	W211004	25-Mar-12	
EPA 200.7	Zinc	mg/L	0.967	0.0150	1.00	95.2	70 - 130	W211004	25-Mar-12	
EPA 200.8	Antimony	mg/L	0.0260	<0.00300	0.0250	103	70 - 130	W211010	20-Mar-12	
EPA 200.8	Arsenic	mg/L	0.0323	0.0034	0.0250	115	70 - 130	W211010	20-Mar-12	
EPA 200.8	Selenium	mg/L	0.0611	0.0296	0.0250	126	70 - 130	W211010	20-Mar-12	
EPA 200.8	Thallium	mg/L	0.0235	<0.00100	0.0250	92.0	70 - 130	W211010	20-Mar-12	
EPA 200.8	Uranium	mg/L	0.0260	<0.00100	0.0250	104	70 - 130	W211010	20-Mar-12	
EPA 245.1	Mercury	mg/L	0.00101	<0.00020	0.000990	102	70 - 130	W211097	14-Mar-12	
EPA 245.1	Mercury	mg/L	0.00095	<0.00020	0.000990	96.0	70 - 130	W211273	15-Mar-12	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	mg/L	0.100	<0.005	0.100	98.8	85 - 115	W210179	12-Mar-12	
ASTM D7237	Cyanide (free)	mg/L	0.101	<0.005	0.100	100	85 - 115	W210179	12-Mar-12	
EPA 335.4	Cyanide (total)	mg/L	0.103	<0.0100	0.100	103	90 - 110	W211255	15-Mar-12	
EPA 335.4	Cyanide (total)	mg/L	0.104	<0.0100	0.100	104	90 - 110	W211255	15-Mar-12	
EPA 350.1	Ammonia as N	mg/L	0.568	0.062	0.500	101	90 - 110	W211301	19-Mar-12	
EPA 353.2	Nitrate/Nitrite as N	mg/L	3.59	2.50	1.00	109	90 - 110	W212176	23-Mar-12	
EPA 353.2	Nitrate/Nitrite as N	mg/L	1.17	<0.050	1.00	116	90 - 110	W212176	23-Mar-12	M1
EPA 410.4	Chemical Oxygen Demand	mg/L	60.3	10.1	50.0	100	90 - 110	W211045	13-Mar-12	
EPA 410.4	Chemical Oxygen Demand	mg/L	69.7	24.1	50.0	91.2	90 - 110	W211045	13-Mar-12	
SM 4500-CN-I	Cyanide (WAD)	mg/L	0.102	<0.0100	0.100	102	75 - 125	W211256	15-Mar-12	
SM 4500-CN-I	Cyanide (WAD)	mg/L	0.101	<0.0100	0.100	101	75 - 125	W211256	15-Mar-12	
SM 4500-P-E	Phosphorus	mg/L	0.537	0.014	0.500	105	75 - 125	W211219	15-Mar-12	
SM 5310B	Total Organic Carbon	mg/L	57.2	6.10	50.0	102	75 - 125	W211288	19-Mar-12	

Anions by Ion Chromatography

EPA 300.0	Fluoride	mg/L	2.32	0.31	2.00	101	90 - 110	W211338	16-Mar-12	
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SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



Tetra Tech EM, Inc. (Boise)
 3380 Americana Terrace, Suite 201
 Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
 Work Order: **W2C0178**
 Reported: 26-Mar-12 13:05

Quality Control - MATRIX SPIKE Data (Continued)

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
Anions by Ion Chromatography (Continued)										
EPA 300.0	Fluoride	mg/L	1.96	<0.10	2.00	95.4	90 - 110	W211338	16-Mar-12	
EPA 300.0	Chloride	mg/L	3.89	0.80	3.00	103	90 - 110	W211338	16-Mar-12	
EPA 300.0	Chloride	mg/L	6.52	3.42	3.00	104	90 - 110	W211338	16-Mar-12	
EPA 300.0	Sulfate as SO4	mg/L	12.1	1.44	10.0	107	90 - 110	W211338	16-Mar-12	
EPA 300.0	Sulfate as SO4	mg/L	11.3	0.81	10.0	105	90 - 110	W211338	16-Mar-12	

Quality Control - MATRIX SPIKE DUPLICATE Data

Method	Analyte	Units	MSD Result	Spike Result	Spike Level	RPD	RPD Limit	Batch ID	Analyzed	Notes
Classical Chemistry Parameters										
ASTM D7237	Cyanide (free)	mg/L	0.101	0.100	0.100	1.1	20	W210179	12-Mar-12	
ASTM D7237	Cyanide (free)	mg/L	0.129	0.101	0.100	24.9	20	W210179	12-Mar-12	M1,R5
EPA 350.1	Ammonia as N	mg/L	0.559	0.568	0.500	1.6	20	W211301	19-Mar-12	

Quality Control - POST DIGESTION SPIKE Data

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
Metals (Total Recoverable--reportable as Total per 40 CFR 136)										
EPA 200.7	Aluminum	mg/L	1.60	0.650	1.00	94.5	85 - 115	W211002	23-Mar-12	
EPA 200.7	Silicon	mg/L	7.06	2.70	5.00	87.2	85 - 115	W211002	23-Mar-12	



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2C0178**
Reported: 26-Mar-12 13:05

Notes and Definitions

D2	Sample required dilution due to high concentration of target analyte.
H3	Sample was received and analyzed past holding time.
H5	This test is specified to be performed in the field within 15 minutes of sampling; sample was received and analyzed past the regulatory holding time.
H6	Initial analysis was within holding time. Reanalysis was run past holding time.
M1	Matrix spike recovery was high, but the LCS recovery was acceptable.
M2	Matrix spike recovery was low, but the LCS recovery was acceptable.
M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to spike level. The LCS was acceptable.
N3	heavy particulates, slow to filter
R1	RPD exceeded the method acceptance limit.
R5	MS/MSD RPD exceeded the laboratory acceptance limit.
LCS	Laboratory Control Sample (Blank Spike)
RPD	Relative Percent Difference
UDL	A result is less than the detection limit
R > 4S	% recovery not applicable, sample concentration more than four times greater than spike level
<RL	A result is less than the reporting limit
MRL	Method Reporting Limit
MDL	Method Detection Limit
N/A	Not Applicable



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245
Work Order: **W1L0423**
Reported: 09-Jan-12 17:08

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Sampled By	Date Received
12162011SW025	W1L0423-01	Sediment	16-Dec-11 10:35	BT	21-Dec-2011
12162011SW025	W1L0423-02	Surface Water	16-Dec-11 10:35	BT	21-Dec-2011
12172011SW026	W1L0423-03	Surface Water	17-Dec-11 12:00	BT	21-Dec-2011
12172011SW027	W1L0423-04	Surface Water	17-Dec-11 12:45	BT	21-Dec-2011
12172011SW028	W1L0423-05	Surface Water	17-Dec-11 12:50	BT	21-Dec-2011

Solid samples are analyzed on an as-received, wet-weight basis, unless otherwise requested. Non-Detects are reported at the MDL.

Sample preparation is defined by the client as per their Data Quality Objectives.

This report supercedes any previous reports for this Work Order. The complete report includes pages for each sample, a full QC report, and a notes section.

The results presented in this report relate only to the samples, and meet all requirements of the NELAC Standards unless otherwise noted.

(Q6) SVL received the following containers outside of published EPA guidelines for preservation temperatures (0-6°C).

The guidelines do not pertain to nitric-preserved metals.

Default Cooler (Received Temperature: 9.8°C)

Labnumber	Container	Client ID	Labnumber	Container	Client ID
W1L0423-01 A	Bag, Ziploc	12162011SW025	W1L0423-01 B	Bag, Ziploc	12162011SW025
W1L0423-02 A	Raw HDPE	12162011SW025	W1L0423-02 B	Raw HDPE	12162011SW025
W1L0423-02 C	Sulfuric HDPE	12162011SW025	W1L0423-02 D	Filtered sulfuric HDPE	12162011SW025
W1L0423-02 E	Filtered sulfuric HDPE	12162011SW025	W1L0423-02 F	Sulfuric HDPE	12162011SW025
W1L0423-02 G	Sulfuric HDPE	12162011SW025	W1L0423-02 H	Filtered nitric HDPE	12162011SW025
W1L0423-02 I	Filtered nitric HDPE	12162011SW025	W1L0423-02 J	Nitric HDPE	12162011SW025
W1L0423-02 K	Nitric HDPE	12162011SW025	W1L0423-02 L	NaOH HDPE	12162011SW025
W1L0423-03 A	Raw HDPE	12172011SW026	W1L0423-03 B	Raw HDPE	12172011SW026
W1L0423-04 A	Raw HDPE	12172011SW027	W1L0423-04 B	Raw HDPE	12172011SW027
W1L0423-05 A	Raw HDPE	12172011SW028	W1L0423-05 B	Raw HDPE	12172011SW028

Case Narrative

The sediment sample on this work order has been sieved with a #10 mesh sieve.



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: **Suriname - Merian Gold 2011 / 113-93245**

Work Order: **W1L0423**

Reported: 09-Jan-12 17:08

Client Sample ID: **12162011SW025**

SVL Sample ID: **W1L0423-01 (Sediment)**

Sample Report Page 1 of 3

Sampled: 16-Dec-11 10:35

Received: 21-Dec-11

Sampled By: BT

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 6020	Arsenic	< 0.300	mg/kg	0.300	0.060	5	W152259	KWH	01/05/12 10:49	
EPA 6020	Cadmium	< 0.100	mg/kg	0.100	0.018	5	W152259	KWH	01/05/12 10:49	
EPA 6020	Lead	< 0.100	mg/kg	0.100	0.0125	5	W152259	KWH	01/05/12 10:49	
EPA 6020	Selenium	< 0.300	mg/kg	0.300	0.175	5	W152259	KWH	01/05/12 10:49	
EPA 6020	Silver	< 0.0500	mg/kg	0.0500	0.0085	5	W152259	KWH	01/05/12 10:49	
EPA 6020	Thallium	< 0.100	mg/kg	0.100	0.0033	5	W152259	KWH	01/05/12 10:49	

Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Aluminum	167	mg/kg	8.0	1.6		W152260	AS	01/05/12 11:06	
EPA 6010B	Chromium	0.75	mg/kg	0.60	0.05		W152260	AS	01/05/12 11:07	
EPA 6010B	Copper	< 1.00	mg/kg	1.00	0.21		W152260	AS	01/05/12 11:07	
EPA 6010B	Iron	276	mg/kg	6.0	1.1		W152260	AS	01/05/12 11:06	
EPA 6010B	Manganese	0.42	mg/kg	0.40	0.04		W152260	AS	01/05/12 11:06	
EPA 6010B	Nickel	< 1.00	mg/kg	1.00	0.22		W152260	AS	01/05/12 11:07	
EPA 6010B	Vanadium	0.98	mg/kg	0.50	0.04		W152260	AS	01/05/12 11:07	
EPA 6010B	Zinc	< 1.00	mg/kg	1.00	0.09		W152260	AS	01/05/12 11:07	
EPA 7471A	Mercury	< 0.033	mg/kg	0.033	0.007		W201054	DJA	01/06/12 15:49	

Classical Chemistry Parameters

SM 4500-CN-I	Cyanide (WAD)	< 0.500	mg/kg	0.500	0.065		W153036	CFE	12/28/11 14:32	
SW846 9012B	Cyanide (total)	< 0.50	mg/kg	0.50	0.10		W153035	CFE	12/28/11 12:50	
SW-846 9213	Cyanide (free)	< 1.00	mg/kg	1.00	0.09		W153078	CFE	12/30/11 08:30	
USDA HB60(24)	Total Organic Carbon	0.311	%	0.0900	0.0180		W201046	SM	01/05/12 10:20	
USDA HB60(24)	Total Organic Matter	0.536	%	0.150	0.0310		W201046	SM	01/05/12 10:20	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: W1L0423

Reported: 09-Jan-12 17:08

Client Sample ID: 12162011SW025

SVL Sample ID: W1L0423-02 (Surface Water)

Sample Report Page 1 of 3

Sampled: 16-Dec-11 10:35

Received: 21-Dec-11

Sampled By: BT

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W201063	JAA	01/04/12 19:30	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	0.103	mg/L	0.080	0.008		W153060	TJK	01/05/12 14:10	
EPA 200.7	Barium	0.0050	mg/L	0.0020	0.0002		W153060	AS	01/05/12 12:31	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0002		W153060	AS	01/05/12 12:30	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W153060	AS	01/05/12 12:30	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0002		W153060	AS	01/05/12 12:31	
EPA 200.7	Calcium	0.195	mg/L	0.040	0.006		W153060	AS	01/05/12 12:30	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0003		W153060	AS	01/05/12 12:31	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W153060	AS	01/05/12 12:31	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.002		W153060	AS	01/05/12 12:31	
EPA 200.7	Iron	0.904	mg/L	0.060	0.008		W153060	AS	01/05/12 12:30	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0017		W153060	AS	01/05/12 12:31	
EPA 200.7	Magnesium	0.613	mg/L	0.060	0.010		W153060	AS	01/05/12 12:30	
EPA 200.7	Manganese	0.0144	mg/L	0.0040	0.0006		W153060	AS	01/05/12 12:30	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.0006		W153060	AS	01/05/12 12:31	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W153060	AS	01/05/12 12:31	
EPA 200.7	Potassium	< 0.50	mg/L	0.50	0.03		W153060	AS	01/05/12 12:29	
EPA 200.7	Silicon	4.50	mg/L	0.08	0.01		W153060	AS	01/05/12 12:30	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0003		W153060	AS	01/05/12 12:31	
EPA 200.7	Sodium	2.55	mg/L	0.50	0.02		W153060	AS	01/05/12 12:29	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0002		W153060	AS	01/05/12 12:31	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0002		W153060	AS	01/05/12 12:31	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0010		W153060	AS	01/05/12 12:31	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00009	2.5	W153006	KWH	01/09/12 07:52	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0006	2.5	W153006	KWH	01/09/12 07:52	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00070	2.5	W153006	KWH	01/09/12 07:52	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000015	2.5	W153006	KWH	01/09/12 07:52	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000011	2.5	W153006	KWH	01/09/12 07:52	
SM 2340B	Hardness (as CaCO3)	3.01	mg/L	0.347	0.058		N/A		01/05/12 12:30	



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0423**

Reported: 09-Jan-12 17:08

Client Sample ID: **12162011SW025**

Sampled: 16-Dec-11 10:35

SVL Sample ID: **W1L0423-02 (Surface Water)**

Received: 21-Dec-11

Sample Report Page 2 of 3

Sampled By: BT

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.016		W153069	TJK	01/05/12 15:06	
EPA 200.7	Barium	0.0037	mg/L	0.0020	0.0004		W153069	AS	01/05/12 13:31	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0004		W153069	AS	01/05/12 13:30	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W153069	AS	01/05/12 13:30	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W153069	AS	01/05/12 13:31	
EPA 200.7	Calcium	0.230	mg/L	0.040	0.012		W153069	AS	01/05/12 13:30	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W153069	AS	01/05/12 13:31	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W153069	AS	01/05/12 13:31	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.003		W153069	AS	01/05/12 13:31	
EPA 200.7	Iron	0.171	mg/L	0.060	0.017		W153069	AS	01/05/12 13:30	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0034		W153069	AS	01/05/12 13:31	
EPA 200.7	Magnesium	0.547	mg/L	0.060	0.021		W153069	AS	01/05/12 13:30	
EPA 200.7	Manganese	0.0172	mg/L	0.0040	0.0011		W153069	AS	01/05/12 13:30	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W153069	AS	01/05/12 13:31	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W153069	AS	01/05/12 13:31	
EPA 200.7	Potassium	< 0.50	mg/L	0.50	0.07		W153069	AS	01/05/12 13:30	
EPA 200.7	Silicon	4.31	mg/L	0.08	0.03		W153069	AS	01/05/12 13:30	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0005		W153069	AS	01/05/12 13:31	
EPA 200.7	Sodium	2.63	mg/L	0.50	0.04		W153069	AS	01/05/12 13:30	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W153069	AS	01/05/12 13:31	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W153069	AS	01/05/12 13:31	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0021		W153069	AS	01/05/12 13:31	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00007		W153010	KWH	12/28/11 09:29	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0005		W153010	KWH	12/28/11 09:29	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00056		W153010	KWH	12/28/11 09:29	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000012		W153010	KWH	12/28/11 09:29	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000009		W153010	KWH	12/28/11 09:29	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W201064	DJA	01/04/12 18:17	
Classical Chemistry Parameters										
ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0009		W153094	CFF	12/28/11 12:41	
EPA 120.1	Specific conductance	23.4	µmhos/cm	5.00			W152265	RS	12/22/11 13:15	
EPA 180.1	Turbidity	0.507	NTU	0.100			W152254	SM	12/22/11 12:03	H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0024		W153027	CFF	12/27/11 14:17	
EPA 350.1	Ammonia as N	< 0.030	mg/L	0.030	0.009		W201175	RHW	01/05/12 18:23	
EPA 353.2	Nitrate/Nitrite as N	0.099	mg/L	0.050	0.015		W201188	SM	01/05/12 16:39	
EPA 410.4	Chemical Oxygen Demand	< 5.0	mg/L	5.0	2.1		W153123	SM	12/30/11 09:36	
SM 2320B/2310B	Bicarbonate	< 1.0	mg/L	1.0	0.5		W152282	DKS	12/27/11 11:45	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.5		W152282	DKS	12/27/11 11:45	
SM 2320B/2310B	Total Alkalinity	< 1.0	mg/L	1.0	0.5		W152282	DKS	12/27/11 11:45	
SM 2540 C	Total Diss. Solids	< 10	mg/L	10			W152236	RS	12/22/11 15:40	
SM 2540 D	Total Susp. Solids	< 5.0	mg/L	5.0			W152264	RS	12/22/11 15:45	
SM 4500 H B	pH @20.0°C	5.24	pH Units				W152282	DKS	12/27/11 11:45	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0013		W153083	CFF	12/28/11 12:03	
SM 4500-P-E	Phosphorus	< 0.010	mg/L	0.010	0.004		W201099	SM	01/04/12 14:58	



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

(208) 784-1258

Fax (208) 783-0891

Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0423**

Reported: 09-Jan-12 17:08

Client Sample ID: **12162011SW025**

SVL Sample ID: **W1L0423-02 (Surface Water)**

Sample Report Page 3 of 3

Sampled: 16-Dec-11 10:35

Received: 21-Dec-11

Sampled By: BT

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	5.19	mg/L	0.20	0.07		W153040	DT	12/28/11 21:18	
EPA 300.0	Fluoride	< 0.10	mg/L	0.10	0.02		W153040	DT	12/28/11 21:18	
EPA 300.0	Sulfate as SO4	0.41	mg/L	0.30	0.04		W153040	AEW	12/27/11 19:08	

Cation/Anion Balance and TDS Ratios

Cation Sum: 0.18 meq/L Anion Sum: 0.17 meq/L C/A Balance: 0.72 % Calculated TDS: 21 TDS/cTDS: 0.00 TDS/eC: 0.00

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



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Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0423**

Reported: 09-Jan-12 17:08

Client Sample ID: **12172011SW026**

SVL Sample ID: **W1L0423-03 (Surface Water)**

Sample Report Page 1 of 1

Sampled: 17-Dec-11 12:00

Received: 21-Dec-11

Sampled By: BT

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Classical Chemistry Parameters

EPA 180.1	Turbidity	628	NTU	2.00		20	W152254	SM	12/22/11 12:03	D2,H3
SM 2540 D	Total Susp. Solids	1220	mg/L	10.0			W152264	RS	12/22/11 15:45	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



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Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0423**

Reported: 09-Jan-12 17:08

Client Sample ID: **12172011SW027**

SVL Sample ID: **W1L0423-04 (Surface Water)**

Sample Report Page 1 of 1

Sampled: 17-Dec-11 12:45

Received: 21-Dec-11

Sampled By: BT

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Classical Chemistry Parameters

EPA 180.1	Turbidity	15.9	NTU	0.100			W152254	SM	12/22/11 12:03	H3
SM 2540 D	Total Susp. Solids	8.0	mg/L	5.0			W152264	RS	12/22/11 15:45	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



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Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0423**

Reported: 09-Jan-12 17:08

Client Sample ID: **12172011SW028**

SVL Sample ID: **W1L0423-05 (Surface Water)**

Sample Report Page 1 of 1

Sampled: 17-Dec-11 12:50

Received: 21-Dec-11

Sampled By: BT

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Classical Chemistry Parameters

EPA 180.1	Turbidity	10.8	NTU	0.100			W152254	SM	12/22/11 12:03	H3
SM 2540 D	Total Susp. Solids	< 5.0	mg/L	5.0			W152264	RS	12/22/11 15:45	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: W1L0423

Reported: 09-Jan-12 17:08

Quality Control - BLANK Data

Method	Analyte	Units	Result	MDL	MRL	Batch ID	Analyzed	Notes
Metals (Total)								
EPA 245.1	Mercury	mg/L	<0.00020	0.000072	0.00020	W201063	04-Jan-12	
EPA 6020	Arsenic	mg/kg	<0.300	0.060	0.300	W152259	05-Jan-12	
EPA 6020	Cadmium	mg/kg	<0.100	0.018	0.100	W152259	05-Jan-12	
EPA 6020	Lead	mg/kg	<0.100	0.0125	0.100	W152259	05-Jan-12	
EPA 6020	Selenium	mg/kg	<0.300	0.175	0.300	W152259	05-Jan-12	
EPA 6020	Silver	mg/kg	<0.0500	0.0085	0.0500	W152259	05-Jan-12	
EPA 6020	Thallium	mg/kg	<0.100	0.0033	0.100	W152259	05-Jan-12	
Metals (Total) by EPA 6000/7000 Methods								
EPA 6010B	Aluminum	mg/kg	<8.0	1.6	8.0	W152260	05-Jan-12	
EPA 6010B	Chromium	mg/kg	<0.60	0.05	0.60	W152260	05-Jan-12	
EPA 6010B	Copper	mg/kg	<1.00	0.21	1.00	W152260	05-Jan-12	
EPA 6010B	Iron	mg/kg	<6.0	1.1	6.0	W152260	05-Jan-12	
EPA 6010B	Manganese	mg/kg	<0.40	0.04	0.40	W152260	05-Jan-12	
EPA 6010B	Nickel	mg/kg	<1.00	0.22	1.00	W152260	05-Jan-12	
EPA 6010B	Vanadium	mg/kg	<0.50	0.04	0.50	W152260	05-Jan-12	
EPA 6010B	Zinc	mg/kg	<1.00	0.09	1.00	W152260	05-Jan-12	
EPA 7471A	Mercury	mg/kg	<0.033	0.007	0.033	W201054	06-Jan-12	
Metals (Total Recoverable--reportable as Total per 40 CFR 136)								
EPA 200.7	Aluminum	mg/L	<0.080	0.008	0.080	W153060	05-Jan-12	
EPA 200.7	Barium	mg/L	<0.0020	0.0002	0.0020	W153060	05-Jan-12	
EPA 200.7	Beryllium	mg/L	<0.0020	0.0002	0.0020	W153060	05-Jan-12	
EPA 200.7	Boron	mg/L	<0.040	0.005	0.040	W153060	05-Jan-12	
EPA 200.7	Cadmium	mg/L	<0.0020	0.0002	0.0020	W153060	05-Jan-12	
EPA 200.7	Calcium	mg/L	<0.040	0.006	0.040	W153060	05-Jan-12	
EPA 200.7	Chromium	mg/L	<0.0060	0.0003	0.0060	W153060	05-Jan-12	
EPA 200.7	Cobalt	mg/L	<0.0060	0.0005	0.0060	W153060	05-Jan-12	
EPA 200.7	Copper	mg/L	<0.010	0.002	0.010	W153060	05-Jan-12	
EPA 200.7	Iron	mg/L	<0.060	0.008	0.060	W153060	05-Jan-12	
EPA 200.7	Lead	mg/L	<0.0075	0.0017	0.0075	W153060	05-Jan-12	
EPA 200.7	Magnesium	mg/L	<0.060	0.010	0.060	W153060	05-Jan-12	
EPA 200.7	Manganese	mg/L	<0.0040	0.0006	0.0040	W153060	05-Jan-12	
EPA 200.7	Molybdenum	mg/L	<0.008	0.0006	0.008	W153060	05-Jan-12	
EPA 200.7	Nickel	mg/L	<0.010	0.002	0.010	W153060	05-Jan-12	
EPA 200.7	Potassium	mg/L	<0.50	0.03	0.50	W153060	05-Jan-12	
EPA 200.7	Silicon	mg/L	<0.08	0.01	0.08	W153060	05-Jan-12	
EPA 200.7	Silver	mg/L	<0.0050	0.0003	0.0050	W153060	05-Jan-12	
EPA 200.7	Sodium	mg/L	<0.50	0.02	0.50	W153060	05-Jan-12	
EPA 200.7	Titanium	mg/L	<0.0050	0.0002	0.0050	W153060	05-Jan-12	
EPA 200.7	Vanadium	mg/L	<0.0050	0.0002	0.0050	W153060	05-Jan-12	
EPA 200.7	Zinc	mg/L	<0.0100	0.0010	0.0100	W153060	05-Jan-12	
EPA 200.8	Antimony	mg/L	<0.00300	0.00009	0.00300	W153006	09-Jan-12	
EPA 200.8	Arsenic	mg/L	<0.0030	0.0006	0.0030	W153006	09-Jan-12	
EPA 200.8	Selenium	mg/L	<0.00300	0.00070	0.00300	W153006	09-Jan-12	
EPA 200.8	Uranium	mg/L	<0.00100	0.000011	0.00100	W153006	09-Jan-12	
EPA 200.8	Thallium	mg/L	<0.00100	0.000015	0.00100	W153006	09-Jan-12	
Metals (Dissolved)								
EPA 200.7	Aluminum	mg/L	<0.080	0.016	0.080	W153069	05-Jan-12	
EPA 200.7	Barium	mg/L	<0.0020	0.0004	0.0020	W153069	05-Jan-12	
EPA 200.7	Beryllium	mg/L	<0.0020	0.0004	0.0020	W153069	05-Jan-12	
EPA 200.7	Boron	mg/L	<0.040	0.010	0.040	W153069	05-Jan-12	
EPA 200.7	Cadmium	mg/L	<0.0020	0.0005	0.0020	W153069	05-Jan-12	
EPA 200.7	Calcium	mg/L	<0.040	0.012	0.040	W153069	05-Jan-12	
EPA 200.7	Chromium	mg/L	<0.0060	0.0006	0.0060	W153069	05-Jan-12	
EPA 200.7	Cobalt	mg/L	<0.0060	0.0009	0.0060	W153069	05-Jan-12	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268

Work order Report Page 9 of 17



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245
Work Order: **W1L0423**
Reported: 09-Jan-12 17:08

Quality Control - BLANK Data (Continued)

Method	Analyte	Units	Result	MDL	MRL	Batch ID	Analyzed	Notes
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Metals (Dissolved) (Continued)

EPA 200.7	Copper	mg/L	<0.010	0.003	0.010	W153069	05-Jan-12	
EPA 200.7	Iron	mg/L	<0.060	0.017	0.060	W153069	05-Jan-12	
EPA 200.7	Lead	mg/L	<0.0075	0.0034	0.0075	W153069	05-Jan-12	
EPA 200.7	Magnesium	mg/L	<0.060	0.021	0.060	W153069	05-Jan-12	
EPA 200.7	Manganese	mg/L	<0.0040	0.0011	0.0040	W153069	05-Jan-12	
EPA 200.7	Molybdenum	mg/L	<0.008	0.001	0.008	W153069	05-Jan-12	
EPA 200.7	Nickel	mg/L	<0.010	0.003	0.010	W153069	05-Jan-12	
EPA 200.7	Potassium	mg/L	<0.50	0.07	0.50	W153069	05-Jan-12	
EPA 200.7	Silicon	mg/L	<0.08	0.03	0.08	W153069	05-Jan-12	
EPA 200.7	Silver	mg/L	<0.0050	0.0005	0.0050	W153069	05-Jan-12	
EPA 200.7	Sodium	mg/L	<0.50	0.04	0.50	W153069	05-Jan-12	
EPA 200.7	Titanium	mg/L	<0.0050	0.0003	0.0050	W153069	05-Jan-12	
EPA 200.7	Vanadium	mg/L	<0.0050	0.0005	0.0050	W153069	05-Jan-12	
EPA 200.7	Zinc	mg/L	<0.0100	0.0021	0.0100	W153069	05-Jan-12	
EPA 200.8	Antimony	mg/L	<0.00300	0.00007	0.00300	W153010	28-Dec-11	
EPA 200.8	Arsenic	mg/L	<0.0030	0.0005	0.0030	W153010	28-Dec-11	
EPA 200.8	Selenium	mg/L	<0.00300	0.00056	0.00300	W153010	28-Dec-11	
EPA 200.8	Thallium	mg/L	<0.00100	0.000012	0.00100	W153010	28-Dec-11	
EPA 200.8	Uranium	mg/L	<0.0100	0.000009	0.0100	W153010	28-Dec-11	
EPA 245.1	Mercury	mg/L	<0.00020	0.000072	0.00020	W201064	04-Jan-12	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	mg/L	<0.005	0.0009	0.005	W153094	28-Dec-11	
EPA 120.1	Specific conductance	µmhos/cm	<5.00		5.00	W152265	22-Dec-11	
EPA 180.1	Turbidity	NTU	<0.100		0.100	W152254	22-Dec-11	
EPA 335.4	Cyanide (total)	mg/L	<0.0100	0.0024	0.0100	W153027	27-Dec-11	
EPA 350.1	Ammonia as N	mg/L	<0.030	0.009	0.030	W201175	05-Jan-12	
EPA 353.2	Nitrate/Nitrite as N	mg/L	<0.050	0.015	0.050	W201188	05-Jan-12	
EPA 410.4	Chemical Oxygen Demand	mg/L	<5.0	2.1	5.0	W153123	30-Dec-11	
SM 2540 C	Total Diss. Solids	mg/L	<10		10	W152236	22-Dec-11	
SM 2540 D	Total Susp. Solids	mg/L	<5.0		5.0	W152264	22-Dec-11	
SM 4500-CN-I	Cyanide (WAD)	mg/kg	<0.500	0.065	0.500	W153036	28-Dec-11	
SM 4500-CN-I	Cyanide (WAD)	mg/L	<0.0100	0.0013	0.0100	W153083	28-Dec-11	
SM 4500-P-E	Phosphorus	mg/L	<0.010	0.004	0.010	W201099	04-Jan-12	
SW846 9012B	Cyanide (total)	mg/kg	<0.50	0.10	0.50	W153035	28-Dec-11	
SW-846 9213	Cyanide (free)	mg/kg	<1.00	0.09	1.00	W153078	30-Dec-11	
USDA HB60(24)	Total Organic Matter	%	<0.150	0.0310	0.150	W201046	05-Jan-12	
USDA HB60(24)	Total Organic Carbon	%	<0.0900	0.0180	0.0900	W201046	05-Jan-12	

Anions by Ion Chromatography

EPA 300.0	Fluoride	mg/L	<0.10	0.02	0.10	W153040	27-Dec-11	
EPA 300.0	Chloride	mg/L	<0.20	0.07	0.20	W153040	27-Dec-11	
EPA 300.0	Sulfate as SO4	mg/L	<0.30	0.04	0.30	W153040	27-Dec-11	

Quality Control - LABORATORY CONTROL SAMPLE Data

Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	mg/L	0.00468	0.00500	93.6	85 - 115	W201063	04-Jan-12	
EPA 6020	Arsenic	mg/kg	2.68	2.50	107	80 - 120	W152259	05-Jan-12	
EPA 6020	Cadmium	mg/kg	2.59	2.50	103	80 - 120	W152259	05-Jan-12	
EPA 6020	Lead	mg/kg	2.42	2.50	96.8	80 - 120	W152259	05-Jan-12	
EPA 6020	Selenium	mg/kg	2.83	2.50	113	80 - 120	W152259	05-Jan-12	
EPA 6020	Silver	mg/kg	2.53	2.50	101	80 - 120	W152259	05-Jan-12	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



Golder Associates (WA)
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Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0423**

Reported: 09-Jan-12 17:08

Quality Control - LABORATORY CONTROL SAMPLE Data (Continued)

Metals (Total) (Continued)

Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
EPA 6020	Thallium	mg/kg	2.42	2.50	96.9	80 - 120	W152259	05-Jan-12	

Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Aluminum	mg/kg	101	100	101	80 - 120	W152260	05-Jan-12	
EPA 6010B	Chromium	mg/kg	100	100	100	80 - 120	W152260	05-Jan-12	
EPA 6010B	Copper	mg/kg	99.0	100	99.0	80 - 120	W152260	05-Jan-12	
EPA 6010B	Iron	mg/kg	959	1000	95.9	80 - 120	W152260	05-Jan-12	
EPA 6010B	Manganese	mg/kg	97.5	100	97.5	80 - 120	W152260	05-Jan-12	
EPA 6010B	Nickel	mg/kg	95.4	100	95.4	80 - 120	W152260	05-Jan-12	
EPA 6010B	Vanadium	mg/kg	102	100	102	80 - 120	W152260	05-Jan-12	
EPA 6010B	Zinc	mg/kg	94.4	100	94.4	80 - 120	W152260	05-Jan-12	
EPA 7471A	Mercury	mg/kg	0.813	0.833	97.6	80 - 120	W201054	06-Jan-12	

Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	mg/L	1.01	1.00	101	85 - 115	W153060	05-Jan-12	
EPA 200.7	Barium	mg/L	1.01	1.00	101	85 - 115	W153060	05-Jan-12	
EPA 200.7	Beryllium	mg/L	0.993	1.00	99.3	85 - 115	W153060	05-Jan-12	
EPA 200.7	Boron	mg/L	1.04	1.00	104	85 - 115	W153060	05-Jan-12	
EPA 200.7	Cadmium	mg/L	1.01	1.00	101	85 - 115	W153060	05-Jan-12	
EPA 200.7	Calcium	mg/L	18.3	20.0	91.6	85 - 115	W153060	05-Jan-12	
EPA 200.7	Chromium	mg/L	1.02	1.00	102	85 - 115	W153060	05-Jan-12	
EPA 200.7	Cobalt	mg/L	0.991	1.00	99.1	85 - 115	W153060	05-Jan-12	
EPA 200.7	Copper	mg/L	1.00	1.00	100	85 - 115	W153060	05-Jan-12	
EPA 200.7	Iron	mg/L	9.40	10.0	94.0	85 - 115	W153060	05-Jan-12	
EPA 200.7	Lead	mg/L	1.01	1.00	101	85 - 115	W153060	05-Jan-12	
EPA 200.7	Magnesium	mg/L	18.7	20.0	93.6	85 - 115	W153060	05-Jan-12	
EPA 200.7	Manganese	mg/L	0.996	1.00	99.6	85 - 115	W153060	05-Jan-12	
EPA 200.7	Molybdenum	mg/L	1.00	1.00	100	85 - 115	W153060	05-Jan-12	
EPA 200.7	Nickel	mg/L	0.952	1.00	95.2	85 - 115	W153060	05-Jan-12	
EPA 200.7	Potassium	mg/L	19.8	20.0	99.1	85 - 115	W153060	05-Jan-12	
EPA 200.7	Silicon	mg/L	4.96	5.00	99.1	85 - 115	W153060	05-Jan-12	
EPA 200.7	Silver	mg/L	0.0508	0.0500	102	85 - 115	W153060	05-Jan-12	
EPA 200.7	Sodium	mg/L	17.7	19.0	93.4	85 - 115	W153060	05-Jan-12	
EPA 200.7	Titanium	mg/L	1.02	1.00	102	85 - 115	W153060	05-Jan-12	
EPA 200.7	Vanadium	mg/L	1.03	1.00	103	85 - 115	W153060	05-Jan-12	
EPA 200.7	Zinc	mg/L	1.01	1.00	101	85 - 115	W153060	05-Jan-12	
EPA 200.8	Antimony	mg/L	0.0278	0.0250	111	85 - 115	W153006	09-Jan-12	
EPA 200.8	Arsenic	mg/L	0.0252	0.0250	101	85 - 115	W153006	09-Jan-12	
EPA 200.8	Selenium	mg/L	0.0254	0.0250	102	85 - 115	W153006	09-Jan-12	
EPA 200.8	Uranium	mg/L	0.0268	0.0250	107	85 - 115	W153006	09-Jan-12	
EPA 200.8	Thallium	mg/L	0.0269	0.0250	108	85 - 115	W153006	09-Jan-12	

Metals (Dissolved)

EPA 200.7	Aluminum	mg/L	1.08	1.00	108	85 - 115	W153069	05-Jan-12	
EPA 200.7	Barium	mg/L	1.02	1.00	102	85 - 115	W153069	05-Jan-12	
EPA 200.7	Beryllium	mg/L	0.979	1.00	97.9	85 - 115	W153069	05-Jan-12	
EPA 200.7	Boron	mg/L	1.03	1.00	103	85 - 115	W153069	05-Jan-12	
EPA 200.7	Cadmium	mg/L	1.01	1.00	101	85 - 115	W153069	05-Jan-12	
EPA 200.7	Calcium	mg/L	18.5	20.0	92.5	85 - 115	W153069	05-Jan-12	
EPA 200.7	Chromium	mg/L	1.01	1.00	101	85 - 115	W153069	05-Jan-12	
EPA 200.7	Cobalt	mg/L	0.991	1.00	99.1	85 - 115	W153069	05-Jan-12	
EPA 200.7	Copper	mg/L	0.988	1.00	98.8	85 - 115	W153069	05-Jan-12	
EPA 200.7	Iron	mg/L	9.37	10.0	93.7	85 - 115	W153069	05-Jan-12	
EPA 200.7	Lead	mg/L	1.00	1.00	100	85 - 115	W153069	05-Jan-12	
EPA 200.7	Magnesium	mg/L	18.9	20.0	94.3	85 - 115	W153069	05-Jan-12	
EPA 200.7	Manganese	mg/L	0.993	1.00	99.3	85 - 115	W153069	05-Jan-12	
EPA 200.7	Molybdenum	mg/L	0.983	1.00	98.3	85 - 115	W153069	05-Jan-12	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0423**

Reported: 09-Jan-12 17:08

Quality Control - LABORATORY CONTROL SAMPLE Data (Continued)

Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Dissolved) (Continued)

EPA 200.7	Nickel	mg/L	0.932	1.00	93.2	85 - 115	W153069	05-Jan-12	
EPA 200.7	Potassium	mg/L	19.7	20.0	98.4	85 - 115	W153069	05-Jan-12	
EPA 200.7	Silicon	mg/L	4.88	5.00	97.5	85 - 115	W153069	05-Jan-12	
EPA 200.7	Silver	mg/L	0.0503	0.0500	101	85 - 115	W153069	05-Jan-12	
EPA 200.7	Sodium	mg/L	17.8	19.0	93.5	85 - 115	W153069	05-Jan-12	
EPA 200.7	Titanium	mg/L	1.01	1.00	101	85 - 115	W153069	05-Jan-12	
EPA 200.7	Vanadium	mg/L	1.02	1.00	102	85 - 115	W153069	05-Jan-12	
EPA 200.7	Zinc	mg/L	1.01	1.00	101	85 - 115	W153069	05-Jan-12	
EPA 200.8	Antimony	mg/L	0.0250	0.0250	100	85 - 115	W153010	28-Dec-11	
EPA 200.8	Arsenic	mg/L	0.0251	0.0250	101	85 - 115	W153010	28-Dec-11	
EPA 200.8	Selenium	mg/L	0.0249	0.0250	99.7	85 - 115	W153010	28-Dec-11	
EPA 200.8	Thallium	mg/L	0.0249	0.0250	99.7	85 - 115	W153010	28-Dec-11	
EPA 200.8	Uranium	mg/L	0.0245	0.0250	98.0	85 - 115	W153010	28-Dec-11	
EPA 245.1	Mercury	mg/L	0.00436	0.00500	87.2	85 - 115	W201064	04-Jan-12	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	mg/L	0.158	0.150	105	85 - 115	W153094	28-Dec-11	
EPA 120.1	Specific conductance	µmhos/cm	471	479	98.3	90 - 110	W152265	22-Dec-11	
EPA 180.1	Turbidity	NTU	4.37	4.39	99.5	90 - 110	W152254	22-Dec-11	
EPA 335.4	Cyanide (total)	mg/L	0.153	0.150	102	90 - 110	W153027	27-Dec-11	
EPA 350.1	Ammonia as N	mg/L	0.686	0.750	91.4	90 - 110	W201175	05-Jan-12	
EPA 353.2	Nitrate/Nitrite as N	mg/L	1.95	2.00	97.6	90 - 110	W201188	05-Jan-12	
EPA 410.4	Chemical Oxygen Demand	mg/L	111	113	98.4	90 - 110	W153123	30-Dec-11	
SM 4500-CN-I	Cyanide (WAD)	mg/kg	1.55	1.50	103	80 - 120	W153036	28-Dec-11	
SM 4500-CN-I	Cyanide (WAD)	mg/L	0.157	0.150	105	90 - 110	W153083	28-Dec-11	
SM 4500-P-E	Phosphorus	mg/L	0.888	0.877	101	90 - 110	W201099	04-Jan-12	
SW846 9012B	Cyanide (total)	mg/kg	9.60	9.60	100	80 - 120	W153035	28-Dec-11	
SW-846 9213	Cyanide (free)	mg/kg	10.4	10.0	104	85 - 115	W153078	30-Dec-11	
USDA HB60(24)	Total Organic Matter	%	0.518	0.464	112	80 - 120	W201046	05-Jan-12	
USDA HB60(24)	Total Organic Carbon	%	0.301	0.269	112	80 - 120	W201046	05-Jan-12	

Anions by Ion Chromatography

EPA 300.0	Fluoride	mg/L	1.82	2.00	91.2	90 - 110	W153040	27-Dec-11	
EPA 300.0	Chloride	mg/L	2.72	3.00	90.8	90 - 110	W153040	27-Dec-11	
EPA 300.0	Sulfate as SO4	mg/L	9.65	10.0	96.5	90 - 110	W153040	27-Dec-11	

Quality Control - DUPLICATE Data

Method	Analyte	Units	Duplicate Result	Sample Result	RPD	RPD Limit	Batch ID	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	mg/L	0.00124	0.00122	1.6	20	W201063	04-Jan-12	
EPA 6020	Arsenic	mg/kg	<0.300	<0.300	UDL	20	W152259	05-Jan-12	
EPA 6020	Cadmium	mg/kg	<0.100	<0.100	UDL	20	W152259	05-Jan-12	
EPA 6020	Lead	mg/kg	0.183	<0.100	<RL	20	W152259	05-Jan-12	
EPA 6020	Selenium	mg/kg	<0.300	<0.300	UDL	20	W152259	05-Jan-12	
EPA 6020	Silver	mg/kg	<0.0500	<0.0500	UDL	20	W152259	05-Jan-12	
EPA 6020	Thallium	mg/kg	<0.100	<0.100	UDL	20	W152259	05-Jan-12	

Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	mg/L	0.104	0.103	1.0	20	W153060	05-Jan-12	
EPA 200.7	Barium	mg/L	0.0051	0.0050	1.1	20	W153060	05-Jan-12	
EPA 200.7	Beryllium	mg/L	<0.0020	<0.0020	UDL	20	W153060	05-Jan-12	

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AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



Golder Associates (WA)
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Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: W1L0423

Reported: 09-Jan-12 17:08

Quality Control - DUPLICATE Data (Continued)

Method	Analyte	Units	Duplicate Result	Sample Result	RPD	RPD Limit	Batch ID	Analyzed	Notes
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Metals (Total Recoverable--reportable as Total per 40 CFR 136) (Continued)

EPA 200.7	Boron	mg/L	<0.040	<0.040	UDL	20	W153060	05-Jan-12	
EPA 200.7	Cadmium	mg/L	<0.0020	<0.0020	UDL	20	W153060	05-Jan-12	
EPA 200.7	Calcium	mg/L	0.196	0.195	0.5	20	W153060	05-Jan-12	
EPA 200.7	Chromium	mg/L	<0.0060	<0.0060	<RL	20	W153060	05-Jan-12	
EPA 200.7	Cobalt	mg/L	<0.0060	<0.0060	UDL	20	W153060	05-Jan-12	
EPA 200.7	Copper	mg/L	<0.010	<0.010	UDL	20	W153060	05-Jan-12	
EPA 200.7	Iron	mg/L	0.908	0.904	0.4	20	W153060	05-Jan-12	
EPA 200.7	Lead	mg/L	<0.0075	<0.0075	UDL	20	W153060	05-Jan-12	
EPA 200.7	Magnesium	mg/L	0.615	0.613	0.4	20	W153060	05-Jan-12	
EPA 200.7	Manganese	mg/L	0.0148	0.0144	2.8	20	W153060	05-Jan-12	
EPA 200.7	Molybdenum	mg/L	<0.008	<0.008	UDL	20	W153060	05-Jan-12	
EPA 200.7	Nickel	mg/L	<0.010	<0.010	<RL	20	W153060	05-Jan-12	
EPA 200.7	Potassium	mg/L	<0.50	<0.50	<RL	20	W153060	05-Jan-12	
EPA 200.7	Silicon	mg/L	4.54	4.50	1.0	20	W153060	05-Jan-12	
EPA 200.7	Silver	mg/L	<0.0050	<0.0050	UDL	20	W153060	05-Jan-12	
EPA 200.7	Sodium	mg/L	2.59	2.55	1.5	20	W153060	05-Jan-12	
EPA 200.7	Titanium	mg/L	<0.0050	<0.0050	<RL	20	W153060	05-Jan-12	
EPA 200.7	Vanadium	mg/L	<0.0050	<0.0050	<RL	20	W153060	05-Jan-12	
EPA 200.7	Zinc	mg/L	<0.0100	<0.0100	<RL	20	W153060	05-Jan-12	
EPA 200.8	Antimony	mg/L	<0.00300	<0.00300	<RL	20	W153006	09-Jan-12	
EPA 200.8	Arsenic	mg/L	0.0096	0.0096	0.2	20	W153006	09-Jan-12	
EPA 200.8	Selenium	mg/L	0.0209	0.0208	0.2	20	W153006	09-Jan-12	
EPA 200.8	Uranium	mg/L	0.0359	0.0349	2.9	20	W153006	09-Jan-12	
EPA 200.8	Thallium	mg/L	<0.00100	<0.00100	<RL	20	W153006	09-Jan-12	

Metals (Dissolved)

EPA 200.7	Aluminum	mg/L	<0.080	<0.080	<RL	20	W153069	05-Jan-12	
EPA 200.7	Barium	mg/L	0.0036	0.0037	2.0	20	W153069	05-Jan-12	
EPA 200.7	Beryllium	mg/L	<0.0020	<0.0020	UDL	20	W153069	05-Jan-12	
EPA 200.7	Boron	mg/L	<0.040	<0.040	UDL	20	W153069	05-Jan-12	
EPA 200.7	Cadmium	mg/L	<0.0020	<0.0020	UDL	20	W153069	05-Jan-12	
EPA 200.7	Calcium	mg/L	0.232	0.230	0.9	20	W153069	05-Jan-12	
EPA 200.7	Chromium	mg/L	<0.0060	<0.0060	UDL	20	W153069	05-Jan-12	
EPA 200.7	Cobalt	mg/L	<0.0060	<0.0060	<RL	20	W153069	05-Jan-12	
EPA 200.7	Copper	mg/L	<0.010	<0.010	UDL	20	W153069	05-Jan-12	
EPA 200.7	Iron	mg/L	0.171	0.171	0.1	20	W153069	05-Jan-12	
EPA 200.7	Lead	mg/L	<0.0075	<0.0075	UDL	20	W153069	05-Jan-12	
EPA 200.7	Magnesium	mg/L	0.541	0.547	1.0	20	W153069	05-Jan-12	
EPA 200.7	Manganese	mg/L	0.0173	0.0172	0.8	20	W153069	05-Jan-12	
EPA 200.7	Molybdenum	mg/L	<0.008	<0.008	UDL	20	W153069	05-Jan-12	
EPA 200.7	Nickel	mg/L	<0.010	<0.010	UDL	20	W153069	05-Jan-12	
EPA 200.7	Potassium	mg/L	<0.50	<0.50	<RL	20	W153069	05-Jan-12	
EPA 200.7	Silicon	mg/L	4.36	4.31	1.0	20	W153069	05-Jan-12	
EPA 200.7	Silver	mg/L	<0.0050	<0.0050	UDL	20	W153069	05-Jan-12	
EPA 200.7	Sodium	mg/L	2.62	2.63	0.0	20	W153069	05-Jan-12	
EPA 200.7	Titanium	mg/L	<0.0050	<0.0050	UDL	20	W153069	05-Jan-12	
EPA 200.7	Vanadium	mg/L	<0.0050	<0.0050	UDL	20	W153069	05-Jan-12	
EPA 200.7	Zinc	mg/L	<0.0100	<0.0100	<RL	20	W153069	05-Jan-12	
EPA 200.8	Antimony	mg/L	<0.00300	<0.00300	<RL	20	W153010	28-Dec-11	
EPA 200.8	Arsenic	mg/L	<0.0030	<0.0030	UDL	20	W153010	28-Dec-11	
EPA 200.8	Selenium	mg/L	<0.00300	<0.00300	UDL	20	W153010	28-Dec-11	
EPA 200.8	Thallium	mg/L	<0.00100	<0.00100	UDL	20	W153010	28-Dec-11	
EPA 200.8	Uranium	mg/L	<0.0100	<0.0100	UDL	20	W153010	28-Dec-11	

Classical Chemistry Parameters

EPA 120.1	Specific conductance	µmhos/cm	23.5	23.4	0.2	20	W152265	22-Dec-11	
EPA 180.1	Turbidity	NTU	0.998	1.04	4.1	20	W152254	22-Dec-11	

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AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



Golder Associates (WA)
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Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: W1L0423

Reported: 09-Jan-12 17:08

Quality Control - DUPLICATE Data (Continued)

Method	Analyte	Units	Duplicate Result	Sample Result	RPD	RPD Limit	Batch ID	Analyzed	Notes
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Classical Chemistry Parameters (Continued)

EPA 335.4	Cyanide (total)	mg/L	2.26	2.27	0.3	20	W153027	27-Dec-11	D2
EPA 350.1	Ammonia as N	mg/L	<0.030	<0.030	UDL	20	W201175	05-Jan-12	
EPA 353.2	Nitrate/Nitrite as N	mg/L	<0.050	<0.050	UDL	20	W201188	05-Jan-12	
EPA 410.4	Chemical Oxygen Demand	mg/L	<5.0	<5.0	UDL	20	W153123	30-Dec-11	
SM 2320B/2310B	Total Alkalinity	mg/L	89.2	89.8	0.6	20	W152282	27-Dec-11	
SM 2320B/2310B	Bicarbonate	mg/L	89.2	89.8	0.6	20	W152282	27-Dec-11	
SM 2320B/2310B	Carbonate	mg/L	<1.0	<1.0	UDL	20	W152282	27-Dec-11	
SM 2540 C	Total Diss. Solids	mg/L	210	201	4.4	10	W152236	22-Dec-11	
SM 2540 C	Total Diss. Solids	mg/L	247	248	0.4	10	W152236	22-Dec-11	
SM 2540 D	Total Susp. Solids	mg/L	2940	2860	2.8	10	W152264	22-Dec-11	
SM 2540 D	Total Susp. Solids	mg/L	8.0	8.0	0.0	10	W152264	22-Dec-11	
SM 4500 H B	pH	pH Units	7.05	7.24	2.7	20	W152282	27-Dec-11	R1
SM 4500-CN-I	Cyanide (WAD)	mg/kg	<0.500	<0.500	UDL	20	W153036	28-Dec-11	
SM 4500-CN-I	Cyanide (WAD)	mg/L	0.0110	0.0110	0.0	20	W153083	28-Dec-11	
SM 4500-P-E	Phosphorus	mg/L	<0.010	<0.010	<RL	20	W201099	04-Jan-12	
SW846 9012B	Cyanide (total)	mg/kg	<0.50	<0.50	UDL	20	W153035	28-Dec-11	
SW-846 9213	Cyanide (free)	mg/kg	<1.00	<1.00	<RL	20	W153078	30-Dec-11	
USDA HB60(24)	Total Organic Matter	%	0.252	0.272	7.4	20	W201046	05-Jan-12	
USDA HB60(24)	Total Organic Carbon	%	0.146	0.158	7.4	20	W201046	05-Jan-12	

Anions by Ion Chromatography

EPA 300.0	Fluoride	mg/L	0.41	0.42	1.6	20	W153040	27-Dec-11	
EPA 300.0	Chloride	mg/L	78.4	81.2	3.6	20	W153040	27-Dec-11	D2
EPA 300.0	Sulfate as SO4	mg/L	67.5	70.0	3.6	20	W153040	27-Dec-11	D2

Quality Control - MATRIX SPIKE Data

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	mg/L	0.00207	0.00122	0.00100	85.0	70 - 130	W201063	04-Jan-12	
EPA 6020	Arsenic	mg/kg	2.23	<0.300	2.50	89.2	75 - 125	W152259	05-Jan-12	
EPA 6020	Cadmium	mg/kg	2.17	<0.100	2.50	86.9	75 - 125	W152259	05-Jan-12	
EPA 6020	Lead	mg/kg	2.15	<0.100	2.50	83.8	75 - 125	W152259	05-Jan-12	
EPA 6020	Selenium	mg/kg	2.40	<0.300	2.50	96.1	75 - 125	W152259	05-Jan-12	
EPA 6020	Silver	mg/kg	2.14	<0.0500	2.50	85.5	75 - 125	W152259	05-Jan-12	
EPA 6020	Thallium	mg/kg	2.04	<0.100	2.50	81.5	75 - 125	W152259	05-Jan-12	

Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Aluminum	mg/kg	969	167	100	802	75 - 125	W152260	05-Jan-12	M1
EPA 6010B	Chromium	mg/kg	101	0.75	100	100	75 - 125	W152260	05-Jan-12	
EPA 6010B	Copper	mg/kg	99.4	<1.00	100	99.0	75 - 125	W152260	05-Jan-12	
EPA 6010B	Iron	mg/kg	1310	276	1000	104	75 - 125	W152260	05-Jan-12	
EPA 6010B	Manganese	mg/kg	98.9	0.42	100	98.5	75 - 125	W152260	05-Jan-12	
EPA 6010B	Nickel	mg/kg	95.4	<1.00	100	95.4	75 - 125	W152260	05-Jan-12	
EPA 6010B	Vanadium	mg/kg	103	0.98	100	102	75 - 125	W152260	05-Jan-12	
EPA 6010B	Zinc	mg/kg	94.0	<1.00	100	93.6	75 - 125	W152260	05-Jan-12	
EPA 7471A	Mercury	mg/kg	3630	2370	0.167	R > 4S	75 - 125	W201054	06-Jan-12	D2,M3

Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	mg/L	1.13	0.103	1.00	102	70 - 130	W153060	05-Jan-12	
EPA 200.7	Barium	mg/L	1.03	0.0050	1.00	103	70 - 130	W153060	05-Jan-12	
EPA 200.7	Beryllium	mg/L	0.987	<0.0020	1.00	98.7	70 - 130	W153060	05-Jan-12	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245
Work Order: **W1L0423**
Reported: 09-Jan-12 17:08

Quality Control - MATRIX SPIKE Data (Continued)

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Total Recoverable--reportable as Total per 40 CFR 136) (Continued)

EPA 200.7	Boron	mg/L	1.03	<0.040	1.00	103	70 - 130	W153060	05-Jan-12	
EPA 200.7	Cadmium	mg/L	1.02	<0.0020	1.00	102	70 - 130	W153060	05-Jan-12	
EPA 200.7	Calcium	mg/L	18.5	0.195	20.0	91.4	70 - 130	W153060	05-Jan-12	
EPA 200.7	Chromium	mg/L	1.03	<0.0060	1.00	103	70 - 130	W153060	05-Jan-12	
EPA 200.7	Cobalt	mg/L	1.00	<0.0060	1.00	100	70 - 130	W153060	05-Jan-12	
EPA 200.7	Copper	mg/L	1.01	<0.010	1.00	101	70 - 130	W153060	05-Jan-12	
EPA 200.7	Iron	mg/L	10.2	0.904	10.0	92.9	70 - 130	W153060	05-Jan-12	
EPA 200.7	Lead	mg/L	1.01	<0.0075	1.00	101	70 - 130	W153060	05-Jan-12	
EPA 200.7	Magnesium	mg/L	19.1	0.613	20.0	92.6	70 - 130	W153060	05-Jan-12	
EPA 200.7	Manganese	mg/L	0.999	0.0144	1.00	98.5	70 - 130	W153060	05-Jan-12	
EPA 200.7	Molybdenum	mg/L	0.999	<0.008	1.00	99.9	70 - 130	W153060	05-Jan-12	
EPA 200.7	Nickel	mg/L	0.952	<0.010	1.00	95.0	70 - 130	W153060	05-Jan-12	
EPA 200.7	Potassium	mg/L	19.7	<0.50	20.0	98.3	70 - 130	W153060	05-Jan-12	
EPA 200.7	Silicon	mg/L	9.46	4.50	5.00	99.3	70 - 130	W153060	05-Jan-12	
EPA 200.7	Silver	mg/L	0.0510	<0.0050	0.0500	102	70 - 130	W153060	05-Jan-12	
EPA 200.7	Sodium	mg/L	20.2	2.55	19.0	92.7	70 - 130	W153060	05-Jan-12	
EPA 200.7	Titanium	mg/L	1.03	<0.0050	1.00	103	70 - 130	W153060	05-Jan-12	
EPA 200.7	Vanadium	mg/L	1.04	<0.0050	1.00	104	70 - 130	W153060	05-Jan-12	
EPA 200.7	Zinc	mg/L	1.02	<0.0100	1.00	102	70 - 130	W153060	05-Jan-12	
EPA 200.8	Antimony	mg/L	0.0278	<0.00300	0.0250	110	70 - 130	W153006	09-Jan-12	
EPA 200.8	Arsenic	mg/L	0.0382	0.0096	0.0250	114	70 - 130	W153006	09-Jan-12	
EPA 200.8	Selenium	mg/L	0.0532	0.0208	0.0250	129	70 - 130	W153006	09-Jan-12	
EPA 200.8	Uranium	mg/L	0.0594	0.0349	0.0250	98.1	70 - 130	W153006	09-Jan-12	
EPA 200.8	Thallium	mg/L	0.0241	<0.00100	0.0250	96.0	70 - 130	W153006	09-Jan-12	

Metals (Dissolved)

EPA 200.7	Aluminum	mg/L	1.14	<0.080	1.00	109	70 - 130	W153069	05-Jan-12	
EPA 200.7	Barium	mg/L	1.06	0.0037	1.00	105	70 - 130	W153069	05-Jan-12	
EPA 200.7	Beryllium	mg/L	1.01	<0.0020	1.00	101	70 - 130	W153069	05-Jan-12	
EPA 200.7	Boron	mg/L	1.06	<0.040	1.00	106	70 - 130	W153069	05-Jan-12	
EPA 200.7	Cadmium	mg/L	1.04	<0.0020	1.00	104	70 - 130	W153069	05-Jan-12	
EPA 200.7	Calcium	mg/L	19.3	0.230	20.0	95.5	70 - 130	W153069	05-Jan-12	
EPA 200.7	Chromium	mg/L	1.04	<0.0060	1.00	104	70 - 130	W153069	05-Jan-12	
EPA 200.7	Cobalt	mg/L	1.03	<0.0060	1.00	102	70 - 130	W153069	05-Jan-12	
EPA 200.7	Copper	mg/L	1.02	<0.010	1.00	102	70 - 130	W153069	05-Jan-12	
EPA 200.7	Iron	mg/L	9.83	0.171	10.0	96.6	70 - 130	W153069	05-Jan-12	
EPA 200.7	Lead	mg/L	1.04	<0.0075	1.00	104	70 - 130	W153069	05-Jan-12	
EPA 200.7	Magnesium	mg/L	20.1	0.547	20.0	97.5	70 - 130	W153069	05-Jan-12	
EPA 200.7	Manganese	mg/L	1.04	0.0172	1.00	102	70 - 130	W153069	05-Jan-12	
EPA 200.7	Molybdenum	mg/L	1.01	<0.008	1.00	101	70 - 130	W153069	05-Jan-12	
EPA 200.7	Nickel	mg/L	0.975	<0.010	1.00	97.5	70 - 130	W153069	05-Jan-12	
EPA 200.7	Potassium	mg/L	20.3	<0.50	20.0	101	70 - 130	W153069	05-Jan-12	
EPA 200.7	Silicon	mg/L	9.33	4.31	5.00	100	70 - 130	W153069	05-Jan-12	
EPA 200.7	Silver	mg/L	0.0511	<0.0050	0.0500	102	70 - 130	W153069	05-Jan-12	
EPA 200.7	Sodium	mg/L	20.7	2.63	19.0	95.3	70 - 130	W153069	05-Jan-12	
EPA 200.7	Titanium	mg/L	1.03	<0.0050	1.00	103	70 - 130	W153069	05-Jan-12	
EPA 200.7	Vanadium	mg/L	1.04	<0.0050	1.00	104	70 - 130	W153069	05-Jan-12	
EPA 200.7	Zinc	mg/L	1.05	<0.0100	1.00	105	70 - 130	W153069	05-Jan-12	
EPA 200.8	Antimony	mg/L	0.0233	<0.00300	0.0250	92.8	70 - 130	W153010	28-Dec-11	
EPA 200.8	Arsenic	mg/L	0.0259	<0.0030	0.0250	103	70 - 130	W153010	28-Dec-11	
EPA 200.8	Selenium	mg/L	0.0272	<0.00300	0.0250	109	70 - 130	W153010	28-Dec-11	
EPA 200.8	Thallium	mg/L	0.0243	<0.00100	0.0250	97.3	70 - 130	W153010	28-Dec-11	
EPA 200.8	Uranium	mg/L	0.0226	<0.0100	0.0250	90.5	70 - 130	W153010	28-Dec-11	
EPA 245.1	Mercury	mg/L	0.00083	<0.00020	0.00100	83.0	70 - 130	W201064	04-Jan-12	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	mg/L	0.105	<0.005	0.100	105	85 - 115	W153094	28-Dec-11	
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SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0423**

Reported: 09-Jan-12 17:08

Quality Control - MATRIX SPIKE Data (Continued)

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
Classical Chemistry Parameters (Continued)										
EPA 335.4	Cyanide (total)	mg/L	2.43	2.27	0.100	R > 4S	90 - 110	W153027	27-Dec-11	D2,M3
EPA 335.4	Cyanide (total)	mg/L	0.102	<0.0100	0.100	102	90 - 110	W153027	27-Dec-11	
EPA 350.1	Ammonia as N	mg/L	0.455	<0.030	0.500	88.3	90 - 110	W201175	05-Jan-12	M2
EPA 350.1	Ammonia as N	mg/L	0.458	0.206	0.500	50.4	90 - 110	W201175	05-Jan-12	M2
EPA 353.2	Nitrate/Nitrite as N	mg/L	1.12	<0.050	1.00	108	90 - 110	W201188	05-Jan-12	
EPA 353.2	Nitrate/Nitrite as N	mg/L	1.82	0.653	1.00	116	90 - 110	W201188	05-Jan-12	M1
EPA 410.4	Chemical Oxygen Demand	mg/L	71.2	25.1	50.0	92.1	90 - 110	W153123	30-Dec-11	
EPA 410.4	Chemical Oxygen Demand	mg/L	50.0	<5.0	50.0	99.9	90 - 110	W153123	30-Dec-11	
SM 4500-CN-I	Cyanide (WAD)	mg/kg	4.15	<0.500	4.00	104	75 - 125	W153036	28-Dec-11	
SM 4500-CN-I	Cyanide (WAD)	mg/kg	3.90	<0.500	4.00	97.5	75 - 125	W153036	28-Dec-11	
SM 4500-CN-I	Cyanide (WAD)	mg/L	0.114	0.0110	0.100	103	75 - 125	W153083	28-Dec-11	
SM 4500-CN-I	Cyanide (WAD)	mg/L	0.110	<0.0100	0.100	101	75 - 125	W153083	28-Dec-11	
SM 4500-P-E	Phosphorus	mg/L	0.509	<0.010	0.500	100	75 - 125	W201099	04-Jan-12	
SW846 9012B	Cyanide (total)	mg/kg	4.01	<0.50	4.00	100	90 - 110	W153035	28-Dec-11	
SW846 9012B	Cyanide (total)	mg/kg	3.94	<0.50	4.00	95.0	90 - 110	W153035	28-Dec-11	
SW-846 9213	Cyanide (free)	mg/kg	9.42	<1.00	10.0	92.9	85 - 115	W153078	30-Dec-11	
SW-846 9213	Cyanide (free)	mg/kg	10.5	<1.00	10.0	103	85 - 115	W153078	30-Dec-11	
USDA HB60(24)	Total Organic Matter	%	3.34	0.272	2.92	105	75 - 125	W201046	05-Jan-12	
USDA HB60(24)	Total Organic Carbon	%	1.94	0.158	1.69	105	75 - 125	W201046	05-Jan-12	

Anions by Ion Chromatography

EPA 300.0	Fluoride	mg/L	2.34	0.42	2.00	96.1	90 - 110	W153040	27-Dec-11	
EPA 300.0	Fluoride	mg/L	2.28	0.13	2.00	108	90 - 110	W153040	28-Dec-11	
EPA 300.0	Chloride	mg/L	80.2	81.2	3.00	R > 4S	90 - 110	W153040	27-Dec-11	D2,M3
EPA 300.0	Chloride	mg/L	7.82	4.84	3.00	99.5	90 - 110	W153040	27-Dec-11	
EPA 300.0	Sulfate as SO4	mg/L	78.2	70.0	10.0	R > 4S	90 - 110	W153040	27-Dec-11	D2,M3
EPA 300.0	Sulfate as SO4	mg/L	30.9	20.7	10.0	102	90 - 110	W153040	27-Dec-11	

Quality Control - MATRIX SPIKE DUPLICATE Data

Method	Analyte	Units	MSD Result	Spike Result	Spike Level	RPD	RPD Limit	Batch ID	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	Aluminum	mg/kg	836	969	100	14.7	20	W152260	05-Jan-12	
EPA 6010B	Chromium	mg/kg	88.6	101	100	13.1	20	W152260	05-Jan-12	
EPA 6010B	Copper	mg/kg	90.6	99.4	100	9.3	20	W152260	05-Jan-12	
EPA 6010B	Iron	mg/kg	1200	1310	1000	9.0	20	W152260	05-Jan-12	
EPA 6010B	Manganese	mg/kg	87.9	98.9	100	11.8	20	W152260	05-Jan-12	
EPA 6010B	Nickel	mg/kg	85.4	95.4	100	11.1	20	W152260	05-Jan-12	
EPA 6010B	Vanadium	mg/kg	91.0	103	100	11.9	20	W152260	05-Jan-12	
EPA 6010B	Zinc	mg/kg	89.4	94.0	100	5.0	20	W152260	05-Jan-12	
EPA 7471A	Mercury	mg/kg	3480	3630	0.167	4.2	20	W201054	06-Jan-12	D2,M3

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	mg/L	0.107	0.105	0.100	2.2	20	W153094	28-Dec-11	
EPA 335.4	Cyanide (total)	mg/L	2.41	2.43	0.100	0.8	20	W153027	27-Dec-11	D2,M3
SM 4500-CN-I	Cyanide (WAD)	mg/L	0.112	0.114	0.100	1.8	20	W153083	28-Dec-11	
SM 4500-P-E	Phosphorus	mg/L	0.513	0.509	0.500	0.7	20	W201099	04-Jan-12	
SW846 9012B	Cyanide (total)	mg/kg	3.94	4.01	4.00	1.8	20	W153035	28-Dec-11	



Golder Associates (WA)
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Project Name: Suriname - Merian Gold 2011 / 113-93245
Work Order: **W1L0423**
Reported: 09-Jan-12 17:08

Quality Control - POST DIGESTION SPIKE Data

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
Metals (Total)										
EPA 6020	Arsenic	mg/kg	2.73	<0.300	2.50	109	75 - 125	W152259	05-Jan-12	
EPA 6020	Cadmium	mg/kg	2.61	<0.100	2.50	105	75 - 125	W152259	05-Jan-12	
EPA 6020	Lead	mg/kg	2.51	<0.1000	2.50	98.1	75 - 125	W152259	05-Jan-12	
EPA 6020	Selenium	mg/kg	2.93	<0.300	2.50	117	75 - 125	W152259	05-Jan-12	
EPA 6020	Silver	mg/kg	2.58	<0.0500	2.50	103	75 - 125	W152259	05-Jan-12	
EPA 6020	Thallium	mg/kg	2.45	<0.1000	2.50	97.9	75 - 125	W152259	05-Jan-12	

Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Aluminum	mg/kg	256	167	100	89.3	75 - 125	W152260	05-Jan-12	
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Notes and Definitions

- D2 Sample required dilution due to high concentration of target analyte.
- H3 Sample was received and analyzed past holding time.
- H5 This test is specified to be performed in the field within 15 minutes of sampling; sample was received and analyzed past the regulatory holding time.
- M1 Matrix spike recovery was high, but the LCS recovery was acceptable.
- M2 Matrix spike recovery was low, but the LCS recovery was acceptable.
- M3 The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to spike level. The LCS was acceptable.
- R1 RPD exceeded the method acceptance limit.
- LCS Laboratory Control Sample (Blank Spike)
- RPD Relative Percent Difference
- UDL A result is less than the detection limit
- R > 4S % recovery not applicable, sample concentration more than four times greater than spike level
- <RL A result is less than the reporting limit
- MRL Method Reporting Limit
- MDL Method Detection Limit
- N/A Not Applicable

GROUND WATER



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

(208) 784-1258

Fax (208) 783-0891

Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname 2011
Work Order: **W1K0270**
Reported: 28-Nov-11 16:02

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Sampled By	Date Received
11012011-GW-001	W1K0270-01	Ground Water	01-Nov-11 16:45	MPK	10-Nov-2011

Solid samples are analyzed on an as-received, wet-weight basis, unless otherwise requested. Non-Detects are reported at the MDL.

Sample preparation is defined by the client as per their Data Quality Objectives.

This report supercedes any previous reports for this Work Order. The complete report includes pages for each sample, a full QC report, and a notes section.

The results presented in this report relate only to the samples, and meet all requirements of the NELAC Standards unless otherwise noted.



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname 2011
Work Order: **W1K0270**
Reported: 28-Nov-11 16:02

Client Sample ID: **11012011-GW-001**SVL Sample ID: **W1K0270-01 (Ground Water)**

Sample Report Page 1 of 2

Sampled: 01-Nov-11 16:45
Received: 10-Nov-11
Sampled By: MPK

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W147199	JAA	11/22/11 12:47	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000011	2.5	W147033	KWH	11/22/11 09:29	
SM 2340B	Hardness (as CaCO3)	9.69	mg/L	0.347	0.116		N/A		11/28/11 09:38	

Metals (Dissolved)

EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.016		W147015	DT	11/28/11 09:38	
EPA 200.7	Barium	0.0051	mg/L	0.0020	0.0004		W147015	DT	11/28/11 09:39	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0004		W147015	DT	11/28/11 09:38	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W147015	DT	11/28/11 09:38	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W147015	DT	11/28/11 09:39	
EPA 200.7	Calcium	0.943	mg/L	0.040	0.012		W147015	DT	11/28/11 09:38	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W147015	DT	11/28/11 09:39	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W147015	DT	11/28/11 09:39	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.003		W147015	DT	11/28/11 09:39	
EPA 200.7	Iron	< 0.060	mg/L	0.060	0.017		W147015	DT	11/28/11 09:38	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0034		W147015	DT	11/28/11 09:39	
EPA 200.7	Magnesium	1.78	mg/L	0.060	0.021		W147015	DT	11/28/11 09:38	
EPA 200.7	Manganese	0.0160	mg/L	0.0040	0.0011		W147015	DT	11/28/11 09:38	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W147015	DT	11/28/11 09:39	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W147015	DT	11/28/11 09:39	
EPA 200.7	Potassium	< 0.50	mg/L	0.50	0.07		W147015	DT	11/28/11 09:37	
EPA 200.7	Silicon	7.34	mg/L	0.08	0.03		W147015	DT	11/28/11 09:37	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0005		W147015	DT	11/28/11 09:39	
EPA 200.7	Sodium	4.44	mg/L	0.50	0.04		W147015	DT	11/28/11 09:37	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W147015	DT	11/28/11 09:39	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W147015	DT	11/28/11 09:39	
EPA 200.7	Zinc	0.0148	mg/L	0.0100	0.0021		W147015	DT	11/28/11 09:39	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00007		W147035	KWH	11/17/11 08:20	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0005		W147035	KWH	11/17/11 08:20	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00056		W147035	KWH	11/17/11 08:20	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000012		W147035	KWH	11/17/11 08:20	
SM 2340B	Hardness (as CaCO3)	9.69	mg/L	0.347	0.116		N/A		11/28/11 09:38	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0009		W147060	CFF	11/15/11 10:58	
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0024		W147063	CFF	11/15/11 13:24	
EPA 350.1	Ammonia as N	0.035	mg/L	0.030	0.009		W147265	CFF	11/17/11 12:06	Q5
EPA 353.2	Nitrate/Nitrite as N	0.131	mg/L	0.050	0.015		W147220	RHW	11/17/11 15:50	
SM 2320B/2310B	Bicarbonate	10.8	mg/L	1.0	0.5		W147054	HJG	11/14/11 11:02	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.5		W147054	HJG	11/14/11 11:02	
SM 2320B/2310B	Total Alkalinity	10.8	mg/L	1.0	0.5		W147054	HJG	11/14/11 11:02	
SM 2540 C	Total Diss. Solids	36	mg/L	10			W147117	rs	11/15/11 13:00	H3
SM 2540 D	Total Susp. Solids	< 5.0	mg/L	5.0			W147146	RS	11/15/11 13:00	H3
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0013		W147067	CFF	11/15/11 17:37	
SM 4500-P-E	Phosphorus	0.022	mg/L	0.010	0.004		W147404	SM	11/18/11 15:53	



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

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Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname 2011
Work Order: **W1K0270**
Reported: 28-Nov-11 16:02

Client Sample ID: **11012011-GW-001**

SVL Sample ID: **W1K0270-01 (Ground Water)**

Sample Report Page 2 of 2

Sampled: 01-Nov-11 16:45
Received: 10-Nov-11
Sampled By: MPK

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	4.88	mg/L	0.20	0.07		W148035	AEW	11/21/11 14:27	
EPA 300.0	Fluoride	< 0.10	mg/L	0.10	0.02		W148035	AEW	11/21/11 14:27	
EPA 300.0	Sulfate as SO4	1.08	mg/L	0.30	0.04		W148035	AEW	11/21/11 14:27	

Cation/Anion Balance and TDS Ratios

Cation Sum: 0.39 meq/L Anion Sum: 0.39 meq/L C/A Balance: 1.01 % Calculated TDS: 40 TDS/cTDS: 0.90

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname 2011
Work Order: **W1K0270**
Reported: 28-Nov-11 16:02

Quality Control - BLANK Data

Method	Analyte	Units	Result	MDL	MRL	Batch ID	Analyzed	Notes
Metals (Total)								
EPA 245.1	Mercury	mg/L	<0.00020	0.000072	0.00020	W147199	22-Nov-11	
Metals (Total Recoverable--reportable as Total per 40 CFR 136)								
EPA 200.8	Uranium	mg/L	<0.00100	0.000011	0.00100	W147033	22-Nov-11	
Metals (Dissolved)								
EPA 200.7	Aluminum	mg/L	<0.080	0.016	0.080	W147015	28-Nov-11	
EPA 200.7	Barium	mg/L	<0.0020	0.0004	0.0020	W147015	28-Nov-11	
EPA 200.7	Beryllium	mg/L	<0.0020	0.0004	0.0020	W147015	28-Nov-11	
EPA 200.7	Boron	mg/L	<0.040	0.010	0.040	W147015	28-Nov-11	
EPA 200.7	Cadmium	mg/L	<0.0020	0.0005	0.0020	W147015	28-Nov-11	
EPA 200.7	Calcium	mg/L	<0.040	0.012	0.040	W147015	28-Nov-11	
EPA 200.7	Chromium	mg/L	<0.0060	0.0006	0.0060	W147015	28-Nov-11	
EPA 200.7	Cobalt	mg/L	<0.0060	0.0009	0.0060	W147015	28-Nov-11	
EPA 200.7	Copper	mg/L	<0.010	0.003	0.010	W147015	28-Nov-11	
EPA 200.7	Iron	mg/L	<0.060	0.017	0.060	W147015	28-Nov-11	
EPA 200.7	Lead	mg/L	<0.0075	0.0034	0.0075	W147015	28-Nov-11	
EPA 200.7	Magnesium	mg/L	<0.060	0.021	0.060	W147015	28-Nov-11	
EPA 200.7	Manganese	mg/L	<0.0040	0.0011	0.0040	W147015	28-Nov-11	
EPA 200.7	Molybdenum	mg/L	<0.008	0.001	0.008	W147015	28-Nov-11	
EPA 200.7	Nickel	mg/L	<0.010	0.003	0.010	W147015	28-Nov-11	
EPA 200.7	Potassium	mg/L	<0.50	0.07	0.50	W147015	28-Nov-11	
EPA 200.7	Silicon	mg/L	<0.08	0.03	0.08	W147015	28-Nov-11	
EPA 200.7	Silver	mg/L	<0.0050	0.0005	0.0050	W147015	28-Nov-11	
EPA 200.7	Sodium	mg/L	<0.50	0.04	0.50	W147015	28-Nov-11	
EPA 200.7	Titanium	mg/L	<0.0050	0.0003	0.0050	W147015	28-Nov-11	
EPA 200.7	Vanadium	mg/L	<0.0050	0.0005	0.0050	W147015	28-Nov-11	
EPA 200.7	Zinc	mg/L	<0.0100	0.0021	0.0100	W147015	28-Nov-11	
EPA 200.8	Antimony	mg/L	<0.00300	0.00007	0.00300	W147035	17-Nov-11	
EPA 200.8	Arsenic	mg/L	<0.0030	0.0005	0.0030	W147035	17-Nov-11	
EPA 200.8	Selenium	mg/L	<0.00300	0.00056	0.00300	W147035	17-Nov-11	
EPA 200.8	Thallium	mg/L	<0.00100	0.000012	0.00100	W147035	17-Nov-11	
Classical Chemistry Parameters								
ASTM D7237	Cyanide (free)	mg/L	<0.005	0.0009	0.005	W147060	15-Nov-11	
EPA 335.4	Cyanide (total)	mg/L	<0.0100	0.0024	0.0100	W147063	15-Nov-11	
EPA 350.1	Ammonia as N	mg/L	<0.030	0.009	0.030	W147265	16-Nov-11	
EPA 353.2	Nitrate/Nitrite as N	mg/L	<0.050	0.015	0.050	W147220	17-Nov-11	
SM 2540 C	Total Diss. Solids	mg/L	<10		10	W147117	15-Nov-11	
SM 2540 D	Total Susp. Solids	mg/L	<5.0		5.0	W147146	15-Nov-11	
SM 4500-CN-I	Cyanide (WAD)	mg/L	<0.0100	0.0013	0.0100	W147067	15-Nov-11	
SM 4500-P-E	Phosphorus	mg/L	<0.010	0.004	0.010	W147404	18-Nov-11	
Anions by Ion Chromatography								
EPA 300.0	Fluoride	mg/L	<0.10	0.02	0.10	W148035	21-Nov-11	
EPA 300.0	Chloride	mg/L	<0.20	0.07	0.20	W148035	21-Nov-11	
EPA 300.0	Sulfate as SO4	mg/L	<0.30	0.04	0.30	W148035	21-Nov-11	



Golder Associates (WA)
 18300 NE Union Hill Road, Suite 200
 Redmond, WA 98052-3333

Project Name: Suriname 2011
 Work Order: **W1K0270**
 Reported: 28-Nov-11 16:02

Quality Control - LABORATORY CONTROL SAMPLE Data

Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
Metals (Total)									
EPA 245.1	Mercury	mg/L	0.00520	0.00500	104	85 - 115	W147199	22-Nov-11	
Metals (Total Recoverable--reportable as Total per 40 CFR 136)									
EPA 200.8	Uranium	mg/L	0.0242	0.0250	96.8	85 - 115	W147033	22-Nov-11	
Metals (Dissolved)									
EPA 200.7	Aluminum	mg/L	0.959	1.00	95.9	85 - 115	W147015	28-Nov-11	
EPA 200.7	Barium	mg/L	1.00	1.00	100	85 - 115	W147015	28-Nov-11	
EPA 200.7	Beryllium	mg/L	0.965	1.00	96.5	85 - 115	W147015	28-Nov-11	
EPA 200.7	Boron	mg/L	0.987	1.00	98.7	85 - 115	W147015	28-Nov-11	
EPA 200.7	Cadmium	mg/L	0.923	1.00	92.3	85 - 115	W147015	28-Nov-11	
EPA 200.7	Calcium	mg/L	18.5	20.0	92.6	85 - 115	W147015	28-Nov-11	
EPA 200.7	Chromium	mg/L	0.918	1.00	91.8	85 - 115	W147015	28-Nov-11	
EPA 200.7	Cobalt	mg/L	0.923	1.00	92.3	85 - 115	W147015	28-Nov-11	
EPA 200.7	Copper	mg/L	0.977	1.00	97.7	85 - 115	W147015	28-Nov-11	
EPA 200.7	Iron	mg/L	9.28	10.0	92.8	85 - 115	W147015	28-Nov-11	
EPA 200.7	Lead	mg/L	0.931	1.00	93.1	85 - 115	W147015	28-Nov-11	
EPA 200.7	Magnesium	mg/L	19.3	20.0	96.5	85 - 115	W147015	28-Nov-11	
EPA 200.7	Manganese	mg/L	0.937	1.00	93.7	85 - 115	W147015	28-Nov-11	
EPA 200.7	Molybdenum	mg/L	0.949	1.00	94.9	85 - 115	W147015	28-Nov-11	
EPA 200.7	Nickel	mg/L	0.858	1.00	85.8	85 - 115	W147015	28-Nov-11	
EPA 200.7	Potassium	mg/L	19.3	20.0	96.5	85 - 115	W147015	28-Nov-11	
EPA 200.7	Silicon	mg/L	4.92	5.00	98.4	85 - 115	W147015	28-Nov-11	
EPA 200.7	Silver	mg/L	0.0459	0.0500	91.9	85 - 115	W147015	28-Nov-11	
EPA 200.7	Sodium	mg/L	18.5	19.0	97.3	85 - 115	W147015	28-Nov-11	
EPA 200.7	Titanium	mg/L	0.950	1.00	95.0	85 - 115	W147015	28-Nov-11	
EPA 200.7	Vanadium	mg/L	0.932	1.00	93.2	85 - 115	W147015	28-Nov-11	
EPA 200.7	Zinc	mg/L	0.936	1.00	93.6	85 - 115	W147015	28-Nov-11	
EPA 200.8	Antimony	mg/L	0.0256	0.0250	103	85 - 115	W147035	17-Nov-11	
EPA 200.8	Arsenic	mg/L	0.0263	0.0250	105	85 - 115	W147035	17-Nov-11	
EPA 200.8	Selenium	mg/L	0.0263	0.0250	105	85 - 115	W147035	17-Nov-11	
EPA 200.8	Thallium	mg/L	0.0257	0.0250	103	85 - 115	W147035	17-Nov-11	
Classical Chemistry Parameters									
ASTM D7237	Cyanide (free)	mg/L	0.150	0.150	100	85 - 115	W147060	15-Nov-11	
EPA 335.4	Cyanide (total)	mg/L	0.163	0.150	109	90 - 110	W147063	15-Nov-11	
EPA 350.1	Ammonia as N	mg/L	0.759	0.750	101	90 - 110	W147265	16-Nov-11	
EPA 353.2	Nitrate/Nitrite as N	mg/L	1.95	2.00	97.3	90 - 110	W147220	17-Nov-11	
SM 4500-CN-I	Cyanide (WAD)	mg/L	0.154	0.150	103	90 - 110	W147067	15-Nov-11	
SM 4500-P-E	Phosphorus	mg/L	0.885	0.877	101	90 - 110	W147404	18-Nov-11	
Anions by Ion Chromatography									
EPA 300.0	Fluoride	mg/L	1.93	2.00	96.4	90 - 110	W148035	21-Nov-11	
EPA 300.0	Chloride	mg/L	2.82	3.00	94.0	90 - 110	W148035	21-Nov-11	
EPA 300.0	Sulfate as SO4	mg/L	9.58	10.0	95.8	90 - 110	W148035	21-Nov-11	



Golder Associates (WA)
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Redmond, WA 98052-3333

Project Name: Suriname 2011
Work Order: **W1K0270**
Reported: 28-Nov-11 16:02

Quality Control - DUPLICATE Data

Method	Analyte	Units	Duplicate Result	Sample Result	RPD	RPD Limit	Batch ID	Analyzed	Notes
Metals (Total)									
EPA 245.1	Mercury	mg/L	<0.00020	<0.00020	UDL	20	W147199	22-Nov-11	
Metals (Total Recoverable--reportable as Total per 40 CFR 136)									
EPA 200.8	Uranium	mg/L	<0.00100	<0.00100	<RL	20	W147033	22-Nov-11	
Metals (Dissolved)									
EPA 200.7	Aluminum	mg/L	<0.080	<0.080	<RL	20	W147015	28-Nov-11	
EPA 200.7	Barium	mg/L	0.0053	0.0051	3.0	20	W147015	28-Nov-11	
EPA 200.7	Beryllium	mg/L	<0.0020	<0.0020	UDL	20	W147015	28-Nov-11	
EPA 200.7	Boron	mg/L	<0.040	<0.040	UDL	20	W147015	28-Nov-11	
EPA 200.7	Cadmium	mg/L	<0.0020	<0.0020	UDL	20	W147015	28-Nov-11	
EPA 200.7	Calcium	mg/L	0.933	0.943	1.1	20	W147015	28-Nov-11	
EPA 200.7	Chromium	mg/L	<0.0060	<0.0060	<RL	20	W147015	28-Nov-11	
EPA 200.7	Cobalt	mg/L	<0.0060	<0.0060	UDL	20	W147015	28-Nov-11	
EPA 200.7	Copper	mg/L	<0.010	<0.010	UDL	20	W147015	28-Nov-11	
EPA 200.7	Iron	mg/L	<0.060	<0.060	UDL	20	W147015	28-Nov-11	
EPA 200.7	Lead	mg/L	<0.0075	<0.0075	UDL	20	W147015	28-Nov-11	
EPA 200.7	Magnesium	mg/L	1.77	1.78	0.9	20	W147015	28-Nov-11	
EPA 200.7	Manganese	mg/L	0.0153	0.0160	4.4	20	W147015	28-Nov-11	
EPA 200.7	Molybdenum	mg/L	<0.008	<0.008	UDL	20	W147015	28-Nov-11	
EPA 200.7	Nickel	mg/L	<0.010	<0.010	UDL	20	W147015	28-Nov-11	
EPA 200.7	Potassium	mg/L	<0.50	<0.50	<RL	20	W147015	28-Nov-11	
EPA 200.7	Silicon	mg/L	7.29	7.34	0.6	20	W147015	28-Nov-11	
EPA 200.7	Silver	mg/L	<0.0050	<0.0050	UDL	20	W147015	28-Nov-11	
EPA 200.7	Sodium	mg/L	4.46	4.44	0.4	20	W147015	28-Nov-11	
EPA 200.7	Titanium	mg/L	<0.0050	<0.0050	UDL	20	W147015	28-Nov-11	
EPA 200.7	Vanadium	mg/L	<0.0050	<0.0050	UDL	20	W147015	28-Nov-11	
EPA 200.7	Zinc	mg/L	0.0151	0.0148	1.7	20	W147015	28-Nov-11	
EPA 200.8	Antimony	mg/L	<0.00300	<0.00300	<RL	20	W147035	17-Nov-11	
EPA 200.8	Arsenic	mg/L	<0.0030	<0.0030	UDL	20	W147035	17-Nov-11	
EPA 200.8	Selenium	mg/L	<0.00300	<0.00300	<RL	20	W147035	17-Nov-11	
EPA 200.8	Thallium	mg/L	<0.00100	<0.00100	UDL	20	W147035	17-Nov-11	
Classical Chemistry Parameters									
EPA 335.4	Cyanide (total)	mg/L	<0.0100	<0.0100	UDL	20	W147063	15-Nov-11	
EPA 350.1	Ammonia as N	mg/L	0.031	0.035	12.0	20	W147265	16-Nov-11	
EPA 353.2	Nitrate/Nitrite as N	mg/L	23.4	24.3	3.8	20	W147220	17-Nov-11	D2
SM 2320B/2310B	Total Alkalinity	mg/L	3.8	3.5	9.1	20	W147054	14-Nov-11	
SM 2320B/2310B	Total Alkalinity	mg/L	46.5	46.0	1.2	20	W147054	14-Nov-11	
SM 2320B/2310B	Total Alkalinity	mg/L	<1.0	<1.0	UDL	20	W147054	16-Nov-11	
SM 2320B/2310B	Bicarbonate	mg/L	3.8	3.5	9.1	20	W147054	14-Nov-11	
SM 2320B/2310B	Bicarbonate	mg/L	46.5	46.0	1.2	20	W147054	14-Nov-11	
SM 2320B/2310B	Bicarbonate	mg/L	<1.0	<1.0	UDL	20	W147054	16-Nov-11	
SM 2320B/2310B	Carbonate	mg/L	<1.0	<1.0	UDL	20	W147054	14-Nov-11	
SM 2320B/2310B	Carbonate	mg/L	<1.0	<1.0	UDL	20	W147054	14-Nov-11	
SM 2320B/2310B	Carbonate	mg/L	<1.0	<1.0	UDL	20	W147054	16-Nov-11	
SM 2540 C	Total Diss. Solids	mg/L	159	153	3.9	10	W147117	15-Nov-11	
SM 2540 D	Total Susp. Solids	mg/L	<5.0	<5.0	<RL	10	W147146	15-Nov-11	
SM 4500-CN-I	Cyanide (WAD)	mg/L	<0.0100	<0.0100	UDL	20	W147067	15-Nov-11	
SM 4500-P-E	Phosphorus	mg/L	0.015	0.016	9.0	20	W147404	18-Nov-11	
Anions by Ion Chromatography									
EPA 300.0	Fluoride	mg/L	<0.10	<0.10	<RL	20	W148035	21-Nov-11	
EPA 300.0	Chloride	mg/L	22.6	22.8	0.9	20	W148035	21-Nov-11	D2
EPA 300.0	Sulfate as SO4	mg/L	14.6	14.6	0.6	20	W148035	21-Nov-11	



Golder Associates (WA)
 18300 NE Union Hill Road, Suite 200
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Project Name: Suriname 2011
 Work Order: **W1K0270**
 Reported: 28-Nov-11 16:02

Quality Control - MATRIX SPIKE Data

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
Metals (Total)										
EPA 245.1	Mercury	mg/L	0.00122	<0.00020	0.00100	122	70 - 130	W147199	22-Nov-11	
Metals (Total Recoverable--reportable as Total per 40 CFR 136)										
EPA 200.8	Uranium	mg/L	0.0246	<0.00100	0.0250	98.4	70 - 130	W147033	22-Nov-11	
Metals (Dissolved)										
EPA 200.7	Aluminum	mg/L	0.992	<0.080	1.00	96.9	70 - 130	W147015	28-Nov-11	
EPA 200.7	Aluminum	mg/L	1.13	0.133	1.00	99.7	70 - 130	W147015	28-Nov-11	
EPA 200.7	Barium	mg/L	1.01	0.0051	1.00	101	70 - 130	W147015	28-Nov-11	
EPA 200.7	Barium	mg/L	1.01	0.0094	1.00	100	70 - 130	W147015	28-Nov-11	
EPA 200.7	Beryllium	mg/L	0.976	<0.0020	1.00	97.6	70 - 130	W147015	28-Nov-11	
EPA 200.7	Beryllium	mg/L	0.987	<0.0020	1.00	98.7	70 - 130	W147015	28-Nov-11	
EPA 200.7	Boron	mg/L	0.994	<0.040	1.00	99.4	70 - 130	W147015	28-Nov-11	
EPA 200.7	Boron	mg/L	1.04	<0.040	1.00	104	70 - 130	W147015	28-Nov-11	
EPA 200.7	Cadmium	mg/L	0.947	<0.0020	1.00	94.7	70 - 130	W147015	28-Nov-11	
EPA 200.7	Cadmium	mg/L	0.956	<0.0020	1.00	95.6	70 - 130	W147015	28-Nov-11	
EPA 200.7	Calcium	mg/L	19.7	0.943	20.0	93.9	70 - 130	W147015	28-Nov-11	
EPA 200.7	Calcium	mg/L	392	372	20.0	98.4	70 - 130	W147015	28-Nov-11	M3
EPA 200.7	Chromium	mg/L	0.932	<0.0060	1.00	93.1	70 - 130	W147015	28-Nov-11	
EPA 200.7	Chromium	mg/L	0.956	<0.0060	1.00	95.3	70 - 130	W147015	28-Nov-11	
EPA 200.7	Cobalt	mg/L	0.942	<0.0060	1.00	94.2	70 - 130	W147015	28-Nov-11	
EPA 200.7	Cobalt	mg/L	0.948	<0.0060	1.00	94.8	70 - 130	W147015	28-Nov-11	
EPA 200.7	Copper	mg/L	0.970	<0.010	1.00	97.0	70 - 130	W147015	28-Nov-11	
EPA 200.7	Copper	mg/L	1.04	0.011	1.00	103	70 - 130	W147015	28-Nov-11	
EPA 200.7	Iron	mg/L	9.40	<0.060	10.0	94.0	70 - 130	W147015	28-Nov-11	
EPA 200.7	Iron	mg/L	9.72	<0.060	10.0	97.2	70 - 130	W147015	28-Nov-11	
EPA 200.7	Lead	mg/L	0.952	<0.0075	1.00	95.2	70 - 130	W147015	28-Nov-11	
EPA 200.7	Lead	mg/L	0.940	<0.0075	1.00	94.0	70 - 130	W147015	28-Nov-11	
EPA 200.7	Magnesium	mg/L	21.3	1.78	20.0	97.5	70 - 130	W147015	28-Nov-11	
EPA 200.7	Magnesium	mg/L	20.2	0.174	20.0	100	70 - 130	W147015	28-Nov-11	
EPA 200.7	Manganese	mg/L	0.965	0.0160	1.00	94.9	70 - 130	W147015	28-Nov-11	
EPA 200.7	Manganese	mg/L	0.981	<0.0040	1.00	98.1	70 - 130	W147015	28-Nov-11	
EPA 200.7	Molybdenum	mg/L	0.957	<0.008	1.00	95.5	70 - 130	W147015	28-Nov-11	
EPA 200.7	Molybdenum	mg/L	1.40	0.380	1.00	102	70 - 130	W147015	28-Nov-11	
EPA 200.7	Nickel	mg/L	0.885	<0.010	1.00	88.5	70 - 130	W147015	28-Nov-11	
EPA 200.7	Nickel	mg/L	0.902	<0.010	1.00	90.2	70 - 130	W147015	28-Nov-11	
EPA 200.7	Potassium	mg/L	19.7	<0.50	20.0	97.1	70 - 130	W147015	28-Nov-11	
EPA 200.7	Potassium	mg/L	50.0	30.5	20.0	97.4	70 - 130	W147015	28-Nov-11	
EPA 200.7	Silicon	mg/L	12.2	7.34	5.00	96.7	70 - 130	W147015	28-Nov-11	
EPA 200.7	Silicon	mg/L	7.03	1.85	5.00	104	70 - 130	W147015	28-Nov-11	
EPA 200.7	Silver	mg/L	0.0468	<0.0050	0.0500	93.5	70 - 130	W147015	28-Nov-11	
EPA 200.7	Silver	mg/L	0.0321	<0.0050	0.0500	64.2	70 - 130	W147015	28-Nov-11	M2
EPA 200.7	Sodium	mg/L	22.9	4.44	19.0	97.3	70 - 130	W147015	28-Nov-11	
EPA 200.7	Sodium	mg/L	38.9	20.6	19.0	96.5	70 - 130	W147015	28-Nov-11	
EPA 200.7	Titanium	mg/L	0.957	<0.0050	1.00	95.7	70 - 130	W147015	28-Nov-11	
EPA 200.7	Titanium	mg/L	0.975	<0.0050	1.00	97.3	70 - 130	W147015	28-Nov-11	
EPA 200.7	Vanadium	mg/L	0.940	<0.0050	1.00	94.0	70 - 130	W147015	28-Nov-11	
EPA 200.7	Vanadium	mg/L	0.986	<0.0050	1.00	98.3	70 - 130	W147015	28-Nov-11	
EPA 200.7	Zinc	mg/L	0.981	0.0148	1.00	96.7	70 - 130	W147015	28-Nov-11	
EPA 200.7	Zinc	mg/L	0.977	<0.0100	1.00	97.2	70 - 130	W147015	28-Nov-11	
EPA 200.8	Antimony	mg/L	0.0250	<0.00300	0.0250	99.2	70 - 130	W147035	17-Nov-11	
EPA 200.8	Antimony	mg/L	0.0237	<0.00300	0.0250	93.8	70 - 130	W147035	17-Nov-11	
EPA 200.8	Arsenic	mg/L	0.0285	<0.0030	0.0250	114	70 - 130	W147035	17-Nov-11	
EPA 200.8	Arsenic	mg/L	0.0281	<0.0030	0.0250	112	70 - 130	W147035	17-Nov-11	
EPA 200.8	Selenium	mg/L	0.0310	<0.00300	0.0250	119	70 - 130	W147035	17-Nov-11	
EPA 200.8	Selenium	mg/L	0.0301	<0.00300	0.0250	120	70 - 130	W147035	17-Nov-11	
EPA 200.8	Thallium	mg/L	0.0249	<0.00100	0.0250	99.4	70 - 130	W147035	17-Nov-11	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname 2011
Work Order: **W1K0270**
Reported: 28-Nov-11 16:02

Quality Control - MATRIX SPIKE Data (Continued)

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Dissolved) (Continued)

EPA 200.8	Thallium	mg/L	0.0249	<0.00100	0.0250	99.4	70 - 130	W147035	17-Nov-11	
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Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	mg/L	0.102	<0.005	0.100	102	85 - 115	W147060	15-Nov-11	
EPA 335.4	Cyanide (total)	mg/L	0.103	<0.0100	0.100	103	90 - 110	W147063	15-Nov-11	
EPA 335.4	Cyanide (total)	mg/L	0.101	<0.0100	0.100	101	90 - 110	W147063	15-Nov-11	
EPA 350.1	Ammonia as N	mg/L	0.528	0.035	0.500	98.6	90 - 110	W147265	17-Nov-11	
EPA 353.2	Nitrate/Nitrite as N	mg/L	24.6	24.3	1.00	R > 4S	90 - 110	W147220	17-Nov-11	D2,M3
EPA 353.2	Nitrate/Nitrite as N	mg/L	3.94	2.92	1.00	102	90 - 110	W147220	17-Nov-11	
SM 4500-CN-I	Cyanide (WAD)	mg/L	0.105	<0.0100	0.100	105	75 - 125	W147067	15-Nov-11	
SM 4500-CN-I	Cyanide (WAD)	mg/L	0.103	<0.0100	0.100	103	75 - 125	W147067	15-Nov-11	
SM 4500-P-E	Phosphorus	mg/L	0.526	0.016	0.500	102	75 - 125	W147404	18-Nov-11	

Anions by Ion Chromatography

EPA 300.0	Fluoride	mg/L	2.25	<0.10	2.00	108	90 - 110	W148035	21-Nov-11	
EPA 300.0	Fluoride	mg/L	3.06	0.78	2.00	114	90 - 110	W148035	21-Nov-11	M1
EPA 300.0	Chloride	mg/L	26.4	22.8	3.00	R > 4S	90 - 110	W148035	21-Nov-11	D2,M3
EPA 300.0	Chloride	mg/L	115	114	3.00	R > 4S	90 - 110	W148035	21-Nov-11	D2,M3
EPA 300.0	Sulfate as SO4	mg/L	25.7	14.6	10.0	110	90 - 110	W148035	21-Nov-11	
EPA 300.0	Sulfate as SO4	mg/L	214	204	10.0	99.2	90 - 110	W148035	21-Nov-11	D2,M3

Quality Control - MATRIX SPIKE DUPLICATE Data

Method	Analyte	Units	MSD Result	Spike Result	Spike Level	RPD	RPD Limit	Batch ID	Analyzed	Notes
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Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	mg/L	0.108	0.102	0.100	6.2	20	W147060	15-Nov-11	
SM 4500-P-E	Phosphorus	mg/L	0.524	0.526	0.500	0.4	20	W147404	18-Nov-11	

Quality Control - POST DIGESTION SPIKE Data

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Dissolved)

EPA 200.7	Silver	mg/L	0.0417	<0.0050	0.0500	83.4	85 - 115	W147015	28-Nov-11	M2
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Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname 2011
Work Order: **W1K0270**
Reported: 28-Nov-11 16:02

Notes and Definitions

D2	Sample required dilution due to high concentration of target analyte.
H3	Sample was received and analyzed past holding time.
M1	Matrix spike recovery was high, but the LCS recovery was acceptable.
M2	Matrix spike recovery was low, but the LCS recovery was acceptable.
M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to spike level. The LCS was acceptable.
Q5	Sample was received with inadequate preservation, but preserved by the laboratory.
LCS	Laboratory Control Sample (Blank Spike)
RPD	Relative Percent Difference
UDL	A result is less than the detection limit
R > 4S	% recovery not applicable, sample concentration more than four times greater than spike level
<RL	A result is less than the reporting limit
MRL	Method Reporting Limit
MDL	Method Detection Limit
N/A	Not Applicable



One Government Gulch - PO Box 929

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Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011
Work Order: **W1K0270**
Reported: 06-Dec-11 12:26

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Sampled By	Date Received
11012011-GW-001	W1K0270-01	Ground Water	01-Nov-11 16:45	MPK	10-Nov-2011

Solid samples are analyzed on an as-received, wet-weight basis, unless otherwise requested. Non-Detects are reported at the MDL.

Sample preparation is defined by the client as per their Data Quality Objectives.

This report supercedes any previous reports for this Work Order. The complete report includes pages for each sample, a full QC report, and a notes section.

The results presented in this report relate only to the samples, and meet all requirements of the NELAC Standards unless otherwise noted.

Case Narrative

12/06/2011 mab: Report reissued. TR metals reported as per client request.



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011
Work Order: **W1K0270**
Reported: 06-Dec-11 12:26

Client Sample ID: **11012011-GW-001**

SVL Sample ID: **W1K0270-01 (Ground Water)**

Sample Report Page 1 of 2

Sampled: 01-Nov-11 16:45
Received: 10-Nov-11
Sampled By: MPK

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W147199	JAA	11/22/11 12:47	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.008		W149244	DT	12/06/11 10:56	
EPA 200.7	Barium	0.0057	mg/L	0.0020	0.0002		W149244	DT	12/06/11 10:57	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0002		W149244	DT	12/06/11 10:56	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W149244	DT	12/06/11 10:56	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0002		W149244	DT	12/06/11 10:57	
EPA 200.7	Calcium	0.902	mg/L	0.040	0.006		W149244	DT	12/06/11 10:55	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0003		W149244	DT	12/06/11 10:57	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W149244	DT	12/06/11 10:57	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.002		W149244	DT	12/06/11 10:57	
EPA 200.7	Iron	< 0.060	mg/L	0.060	0.008		W149244	DT	12/06/11 10:56	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0017		W149244	DT	12/06/11 10:57	
EPA 200.7	Magnesium	1.80	mg/L	0.060	0.010		W149244	DT	12/06/11 10:56	
EPA 200.7	Manganese	0.0161	mg/L	0.0040	0.0006		W149244	DT	12/06/11 10:56	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.0006		W149244	DT	12/06/11 10:57	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W149244	DT	12/06/11 10:57	
EPA 200.7	Potassium	< 0.50	mg/L	0.50	0.03		W149244	DT	12/06/11 10:55	
EPA 200.7	Silicon	7.70	mg/L	0.08	0.01		W149244	DT	12/06/11 10:55	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0003		W149244	DT	12/06/11 10:57	
EPA 200.7	Sodium	4.32	mg/L	0.50	0.02		W149244	DT	12/06/11 10:55	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0002		W149244	DT	12/06/11 10:57	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0002		W149244	DT	12/06/11 10:57	
EPA 200.7	Zinc	0.0152	mg/L	0.0100	0.0010		W149244	DT	12/06/11 10:57	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00009	2.5	W147033	KWH	11/22/11 09:29	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0006	2.5	W147033	KWH	11/22/11 09:29	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00070	2.5	W147033	KWH	11/22/11 09:29	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000015	2.5	W147033	KWH	11/22/11 09:29	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000011	2.5	W147033	KWH	11/22/11 09:29	
SM 2340B	Hardness (as CaCO3)	9.69	mg/L	0.347	0.116		N/A		11/28/11 09:38	



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011
Work Order: W1K0270
Reported: 06-Dec-11 12:26

Client Sample ID: 11012011-GW-001

SVL Sample ID: W1K0270-01 (Ground Water)

Sample Report Page 2 of 2

Sampled: 01-Nov-11 16:45
Received: 10-Nov-11
Sampled By: MPK

Table with 11 columns: Method, Analyte, Result, Units, RL, MDL, Dilution, Batch, Analyst, Analyzed, Notes. Contains data for Metals (Dissolved) including Aluminum, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Silicon, Silver, Sodium, Titanium, Vanadium, Zinc, Antimony, Arsenic, Selenium, Thallium, and Hardness (as CaCO3).

Classical Chemistry Parameters

Table with 11 columns: Method, Analyte, Result, Units, RL, MDL, Dilution, Batch, Analyst, Analyzed, Notes. Contains data for Classical Chemistry Parameters including Cyanide (free), Cyanide (total), Ammonia as N, Nitrate/Nitrite as N, Bicarbonate, Carbonate, Total Alkalinity, Total Diss. Solids, Total Susp. Solids, Cyanide (WAD), and Phosphorus.

Anions by Ion Chromatography

Table with 11 columns: Method, Analyte, Result, Units, RL, MDL, Dilution, Batch, Analyst, Analyzed, Notes. Contains data for Chloride, Fluoride, and Sulfate as SO4.

Cation/Anion Balance and TDS Ratios

Cation Sum: 0.39 meq/L Anion Sum: 0.39 meq/L C/A Balance: -0.18 % Calculated TDS: 40 TDS/cTDS: 0.89

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Larry Drew
Technical Director



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011
Work Order: W1K0270
Reported: 06-Dec-11 12:26

Quality Control - BLANK Data

Method	Analyte	Units	Result	MDL	MRL	Batch ID	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	mg/L	<0.00020	0.000072	0.00020	W147199	22-Nov-11	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	mg/L	<0.080	0.008	0.080	W149244	06-Dec-11	
EPA 200.7	Barium	mg/L	<0.0020	0.0002	0.0020	W149244	06-Dec-11	
EPA 200.7	Beryllium	mg/L	<0.0020	0.0002	0.0020	W149244	06-Dec-11	
EPA 200.7	Boron	mg/L	<0.040	0.005	0.040	W149244	06-Dec-11	
EPA 200.7	Cadmium	mg/L	<0.0020	0.0002	0.0020	W149244	06-Dec-11	
EPA 200.7	Calcium	mg/L	<0.040	0.006	0.040	W149244	06-Dec-11	
EPA 200.7	Chromium	mg/L	<0.0060	0.0003	0.0060	W149244	06-Dec-11	
EPA 200.7	Cobalt	mg/L	<0.0060	0.0005	0.0060	W149244	06-Dec-11	
EPA 200.7	Copper	mg/L	<0.010	0.002	0.010	W149244	06-Dec-11	
EPA 200.7	Iron	mg/L	<0.060	0.008	0.060	W149244	06-Dec-11	
EPA 200.7	Lead	mg/L	<0.0075	0.0017	0.0075	W149244	06-Dec-11	
EPA 200.7	Magnesium	mg/L	<0.060	0.010	0.060	W149244	06-Dec-11	
EPA 200.7	Manganese	mg/L	<0.0040	0.0006	0.0040	W149244	06-Dec-11	
EPA 200.7	Molybdenum	mg/L	<0.008	0.0006	0.008	W149244	06-Dec-11	
EPA 200.7	Nickel	mg/L	<0.010	0.002	0.010	W149244	06-Dec-11	
EPA 200.7	Potassium	mg/L	<0.50	0.03	0.50	W149244	06-Dec-11	
EPA 200.7	Silicon	mg/L	<0.08	0.01	0.08	W149244	06-Dec-11	
EPA 200.7	Silver	mg/L	<0.0050	0.0003	0.0050	W149244	06-Dec-11	
EPA 200.7	Sodium	mg/L	<0.50	0.02	0.50	W149244	06-Dec-11	
EPA 200.7	Titanium	mg/L	<0.0050	0.0002	0.0050	W149244	06-Dec-11	
EPA 200.7	Vanadium	mg/L	<0.0050	0.0002	0.0050	W149244	06-Dec-11	
EPA 200.7	Zinc	mg/L	<0.0100	0.0010	0.0100	W149244	06-Dec-11	
EPA 200.8	Antimony	mg/L	<0.00300	0.00009	0.00300	W147033	22-Nov-11	
EPA 200.8	Arsenic	mg/L	<0.0030	0.0006	0.0030	W147033	22-Nov-11	
EPA 200.8	Selenium	mg/L	<0.00300	0.00070	0.00300	W147033	22-Nov-11	
EPA 200.8	Uranium	mg/L	<0.00100	0.000011	0.00100	W147033	22-Nov-11	
EPA 200.8	Thallium	mg/L	<0.00100	0.000015	0.00100	W147033	22-Nov-11	

Metals (Dissolved)

EPA 200.7	Aluminum	mg/L	<0.080	0.016	0.080	W147015	28-Nov-11	
EPA 200.7	Barium	mg/L	<0.0020	0.0004	0.0020	W147015	28-Nov-11	
EPA 200.7	Beryllium	mg/L	<0.0020	0.0004	0.0020	W147015	28-Nov-11	
EPA 200.7	Boron	mg/L	<0.040	0.010	0.040	W147015	28-Nov-11	
EPA 200.7	Cadmium	mg/L	<0.0020	0.0005	0.0020	W147015	28-Nov-11	
EPA 200.7	Calcium	mg/L	<0.040	0.012	0.040	W147015	28-Nov-11	
EPA 200.7	Chromium	mg/L	<0.0060	0.0006	0.0060	W147015	28-Nov-11	
EPA 200.7	Cobalt	mg/L	<0.0060	0.0009	0.0060	W147015	28-Nov-11	
EPA 200.7	Copper	mg/L	<0.010	0.003	0.010	W147015	28-Nov-11	
EPA 200.7	Iron	mg/L	<0.060	0.017	0.060	W147015	28-Nov-11	
EPA 200.7	Lead	mg/L	<0.0075	0.0034	0.0075	W147015	28-Nov-11	
EPA 200.7	Magnesium	mg/L	<0.060	0.021	0.060	W147015	28-Nov-11	
EPA 200.7	Manganese	mg/L	<0.0040	0.0011	0.0040	W147015	28-Nov-11	
EPA 200.7	Molybdenum	mg/L	<0.008	0.001	0.008	W147015	28-Nov-11	
EPA 200.7	Nickel	mg/L	<0.010	0.003	0.010	W147015	28-Nov-11	
EPA 200.7	Potassium	mg/L	<0.50	0.07	0.50	W147015	28-Nov-11	
EPA 200.7	Silicon	mg/L	<0.08	0.03	0.08	W147015	28-Nov-11	
EPA 200.7	Silver	mg/L	<0.0050	0.0005	0.0050	W147015	28-Nov-11	
EPA 200.7	Sodium	mg/L	<0.50	0.04	0.50	W147015	28-Nov-11	
EPA 200.7	Titanium	mg/L	<0.0050	0.0003	0.0050	W147015	28-Nov-11	
EPA 200.7	Vanadium	mg/L	<0.0050	0.0005	0.0050	W147015	28-Nov-11	
EPA 200.7	Zinc	mg/L	<0.0100	0.0021	0.0100	W147015	28-Nov-11	
EPA 200.8	Antimony	mg/L	<0.00300	0.00007	0.00300	W147035	17-Nov-11	
EPA 200.8	Arsenic	mg/L	<0.0030	0.0005	0.0030	W147035	17-Nov-11	
EPA 200.8	Selenium	mg/L	<0.00300	0.00056	0.00300	W147035	17-Nov-11	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



Golder Associates (WA) 18300 NE Union Hill Road, Suite 200 Redmond, WA 98052-3333	Project Name: Suriname - Merian Gold 2011 Work Order: W1K0270 Reported: 06-Dec-11 12:26
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Quality Control - BLANK Data (Continued)									
Method	Analyte	Units	Result	MDL	MRL	Batch ID	Analyzed	Notes	

Metals (Dissolved) (Continued)

EPA 200.8	Thallium	mg/L	<0.00100	0.000012	0.00100	W147035	17-Nov-11		
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Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	mg/L	<0.005	0.0009	0.005	W147060	15-Nov-11		
EPA 335.4	Cyanide (total)	mg/L	<0.0100	0.0024	0.0100	W147063	15-Nov-11		
EPA 350.1	Ammonia as N	mg/L	<0.030	0.009	0.030	W147265	16-Nov-11		
EPA 353.2	Nitrate/Nitrite as N	mg/L	<0.050	0.015	0.050	W147220	17-Nov-11		
SM 2540 C	Total Diss. Solids	mg/L	<10		10	W147117	15-Nov-11		
SM 2540 D	Total Susp. Solids	mg/L	<5.0		5.0	W147146	15-Nov-11		
SM 4500-CN-I	Cyanide (WAD)	mg/L	<0.0100	0.0013	0.0100	W147067	15-Nov-11		
SM 4500-P-E	Phosphorus	mg/L	<0.010	0.004	0.010	W147404	18-Nov-11		

Anions by Ion Chromatography

EPA 300.0	Fluoride	mg/L	<0.10	0.02	0.10	W148035	21-Nov-11		
EPA 300.0	Chloride	mg/L	<0.20	0.07	0.20	W148035	21-Nov-11		
EPA 300.0	Sulfate as SO4	mg/L	<0.30	0.04	0.30	W148035	21-Nov-11		

Quality Control - LABORATORY CONTROL SAMPLE Data									
Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes

Metals (Total)

EPA 245.1	Mercury	mg/L	0.00520	0.00500	104	85 - 115	W147199	22-Nov-11	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	mg/L	0.976	1.00	97.6	85 - 115	W149244	06-Dec-11	
EPA 200.7	Barium	mg/L	0.988	1.00	98.8	85 - 115	W149244	06-Dec-11	
EPA 200.7	Beryllium	mg/L	0.967	1.00	96.7	85 - 115	W149244	06-Dec-11	
EPA 200.7	Boron	mg/L	0.999	1.00	99.9	85 - 115	W149244	06-Dec-11	
EPA 200.7	Cadmium	mg/L	0.968	1.00	96.8	85 - 115	W149244	06-Dec-11	
EPA 200.7	Calcium	mg/L	18.9	20.0	94.4	85 - 115	W149244	06-Dec-11	
EPA 200.7	Chromium	mg/L	0.979	1.00	97.9	85 - 115	W149244	06-Dec-11	
EPA 200.7	Cobalt	mg/L	0.960	1.00	96.0	85 - 115	W149244	06-Dec-11	
EPA 200.7	Copper	mg/L	0.953	1.00	95.3	85 - 115	W149244	06-Dec-11	
EPA 200.7	Iron	mg/L	9.80	10.0	98.0	85 - 115	W149244	06-Dec-11	
EPA 200.7	Lead	mg/L	0.969	1.00	96.9	85 - 115	W149244	06-Dec-11	
EPA 200.7	Magnesium	mg/L	19.3	20.0	96.4	85 - 115	W149244	06-Dec-11	
EPA 200.7	Manganese	mg/L	0.973	1.00	97.3	85 - 115	W149244	06-Dec-11	
EPA 200.7	Molybdenum	mg/L	0.989	1.00	98.9	85 - 115	W149244	06-Dec-11	
EPA 200.7	Nickel	mg/L	0.953	1.00	95.3	85 - 115	W149244	06-Dec-11	
EPA 200.7	Potassium	mg/L	19.3	20.0	96.7	85 - 115	W149244	06-Dec-11	
EPA 200.7	Silicon	mg/L	4.98	5.00	99.6	85 - 115	W149244	06-Dec-11	
EPA 200.7	Silver	mg/L	0.0502	0.0500	100	85 - 115	W149244	06-Dec-11	
EPA 200.7	Sodium	mg/L	18.1	19.0	95.1	85 - 115	W149244	06-Dec-11	
EPA 200.7	Titanium	mg/L	0.998	1.00	99.8	85 - 115	W149244	06-Dec-11	
EPA 200.7	Vanadium	mg/L	0.994	1.00	99.4	85 - 115	W149244	06-Dec-11	
EPA 200.7	Zinc	mg/L	0.961	1.00	96.1	85 - 115	W149244	06-Dec-11	
EPA 200.8	Antimony	mg/L	0.0263	0.0250	105	85 - 115	W147033	22-Nov-11	
EPA 200.8	Arsenic	mg/L	0.0247	0.0250	98.8	85 - 115	W147033	22-Nov-11	
EPA 200.8	Selenium	mg/L	0.0251	0.0250	100	85 - 115	W147033	22-Nov-11	
EPA 200.8	Uranium	mg/L	0.0242	0.0250	96.8	85 - 115	W147033	22-Nov-11	
EPA 200.8	Thallium	mg/L	0.0252	0.0250	101	85 - 115	W147033	22-Nov-11	

Metals (Dissolved)

EPA 200.7	Aluminum	mg/L	0.959	1.00	95.9	85 - 115	W147015	28-Nov-11	
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SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011
Work Order: **W1K0270**
Reported: 06-Dec-11 12:26

Quality Control - LABORATORY CONTROL SAMPLE Data (Continued)

Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
Metals (Dissolved) (Continued)									
EPA 200.7	Barium	mg/L	1.00	1.00	100	85 - 115	W147015	28-Nov-11	
EPA 200.7	Beryllium	mg/L	0.965	1.00	96.5	85 - 115	W147015	28-Nov-11	
EPA 200.7	Boron	mg/L	0.987	1.00	98.7	85 - 115	W147015	28-Nov-11	
EPA 200.7	Cadmium	mg/L	0.923	1.00	92.3	85 - 115	W147015	28-Nov-11	
EPA 200.7	Calcium	mg/L	18.5	20.0	92.6	85 - 115	W147015	28-Nov-11	
EPA 200.7	Chromium	mg/L	0.918	1.00	91.8	85 - 115	W147015	28-Nov-11	
EPA 200.7	Cobalt	mg/L	0.923	1.00	92.3	85 - 115	W147015	28-Nov-11	
EPA 200.7	Copper	mg/L	0.977	1.00	97.7	85 - 115	W147015	28-Nov-11	
EPA 200.7	Iron	mg/L	9.28	10.0	92.8	85 - 115	W147015	28-Nov-11	
EPA 200.7	Lead	mg/L	0.931	1.00	93.1	85 - 115	W147015	28-Nov-11	
EPA 200.7	Magnesium	mg/L	19.3	20.0	96.5	85 - 115	W147015	28-Nov-11	
EPA 200.7	Manganese	mg/L	0.937	1.00	93.7	85 - 115	W147015	28-Nov-11	
EPA 200.7	Molybdenum	mg/L	0.949	1.00	94.9	85 - 115	W147015	28-Nov-11	
EPA 200.7	Nickel	mg/L	0.858	1.00	85.8	85 - 115	W147015	28-Nov-11	
EPA 200.7	Potassium	mg/L	19.3	20.0	96.5	85 - 115	W147015	28-Nov-11	
EPA 200.7	Silicon	mg/L	4.92	5.00	98.4	85 - 115	W147015	28-Nov-11	
EPA 200.7	Silver	mg/L	0.0459	0.0500	91.9	85 - 115	W147015	28-Nov-11	
EPA 200.7	Sodium	mg/L	18.5	19.0	97.3	85 - 115	W147015	28-Nov-11	
EPA 200.7	Titanium	mg/L	0.950	1.00	95.0	85 - 115	W147015	28-Nov-11	
EPA 200.7	Vanadium	mg/L	0.932	1.00	93.2	85 - 115	W147015	28-Nov-11	
EPA 200.7	Zinc	mg/L	0.936	1.00	93.6	85 - 115	W147015	28-Nov-11	
EPA 200.8	Antimony	mg/L	0.0256	0.0250	103	85 - 115	W147035	17-Nov-11	
EPA 200.8	Arsenic	mg/L	0.0263	0.0250	105	85 - 115	W147035	17-Nov-11	
EPA 200.8	Selenium	mg/L	0.0263	0.0250	105	85 - 115	W147035	17-Nov-11	
EPA 200.8	Thallium	mg/L	0.0257	0.0250	103	85 - 115	W147035	17-Nov-11	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	mg/L	0.150	0.150	100	85 - 115	W147060	15-Nov-11	
EPA 335.4	Cyanide (total)	mg/L	0.163	0.150	109	90 - 110	W147063	15-Nov-11	
EPA 350.1	Ammonia as N	mg/L	0.759	0.750	101	90 - 110	W147265	16-Nov-11	
EPA 353.2	Nitrate/Nitrite as N	mg/L	1.95	2.00	97.3	90 - 110	W147220	17-Nov-11	
SM 4500-CN-I	Cyanide (WAD)	mg/L	0.154	0.150	103	90 - 110	W147067	15-Nov-11	
SM 4500-P-E	Phosphorus	mg/L	0.885	0.877	101	90 - 110	W147404	18-Nov-11	

Anions by Ion Chromatography

EPA 300.0	Fluoride	mg/L	1.93	2.00	96.4	90 - 110	W148035	21-Nov-11	
EPA 300.0	Chloride	mg/L	2.82	3.00	94.0	90 - 110	W148035	21-Nov-11	
EPA 300.0	Sulfate as SO4	mg/L	9.58	10.0	95.8	90 - 110	W148035	21-Nov-11	

Quality Control - DUPLICATE Data

Method	Analyte	Units	Duplicate Result	Sample Result	RPD	RPD Limit	Batch ID	Analyzed	Notes
Metals (Total)									
EPA 245.1	Mercury	mg/L	<0.00020	<0.00020	UDL	20	W147199	22-Nov-11	
Metals (Total Recoverable--reportable as Total per 40 CFR 136)									
EPA 200.7	Aluminum	mg/L	2.05	1.95	4.9	20	W149244	06-Dec-11	
EPA 200.7	Barium	mg/L	0.0307	0.0306	0.2	20	W149244	06-Dec-11	
EPA 200.7	Beryllium	mg/L	<0.0020	<0.0020	UDL	20	W149244	06-Dec-11	
EPA 200.7	Boron	mg/L	<0.040	<0.040	<RL	20	W149244	06-Dec-11	
EPA 200.7	Cadmium	mg/L	<0.0020	<0.0020	<RL	20	W149244	06-Dec-11	
EPA 200.7	Calcium	mg/L	12.8	13.0	1.4	20	W149244	06-Dec-11	
EPA 200.7	Chromium	mg/L	<0.0060	<0.0060	<RL	20	W149244	06-Dec-11	
EPA 200.7	Cobalt	mg/L	<0.0060	<0.0060	<RL	20	W149244	06-Dec-11	

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Golder Associates (WA)
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Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011
Work Order: **W1K0270**
Reported: 06-Dec-11 12:26

Quality Control - DUPLICATE Data (Continued)

Method	Analyte	Units	Duplicate Result	Sample Result	RPD	RPD Limit	Batch ID	Analyzed	Notes
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Metals (Total Recoverable--reportable as Total per 40 CFR 136) (Continued)

EPA 200.7	Copper	mg/L	<0.010	<0.010	<RL	20	W149244	06-Dec-11	
EPA 200.7	Iron	mg/L	1.79	1.82	2.0	20	W149244	06-Dec-11	
EPA 200.7	Lead	mg/L	<0.0075	<0.0075	<RL	20	W149244	06-Dec-11	
EPA 200.7	Magnesium	mg/L	5.60	5.64	0.7	20	W149244	06-Dec-11	
EPA 200.7	Manganese	mg/L	0.474	0.481	1.4	20	W149244	06-Dec-11	
EPA 200.7	Molybdenum	mg/L	<0.008	<0.008	<RL	20	W149244	06-Dec-11	
EPA 200.7	Nickel	mg/L	0.010	0.010	1.8	20	W149244	06-Dec-11	
EPA 200.7	Potassium	mg/L	0.93	0.93	0.4	20	W149244	06-Dec-11	
EPA 200.7	Silicon	mg/L	19.7	19.5	1.2	20	W149244	06-Dec-11	
EPA 200.7	Silver	mg/L	<0.0050	<0.0050	UDL	20	W149244	06-Dec-11	
EPA 200.7	Sodium	mg/L	27.3	27.6	1.0	20	W149244	06-Dec-11	
EPA 200.7	Titanium	mg/L	0.0073	0.0074	2.1	20	W149244	06-Dec-11	
EPA 200.7	Vanadium	mg/L	<0.0050	<0.0050	<RL	20	W149244	06-Dec-11	
EPA 200.7	Zinc	mg/L	0.0610	0.0620	1.6	20	W149244	06-Dec-11	
EPA 200.8	Antimony	mg/L	<0.00300	<0.00300	UDL	20	W147033	22-Nov-11	
EPA 200.8	Arsenic	mg/L	<0.0030	<0.0030	UDL	20	W147033	22-Nov-11	
EPA 200.8	Selenium	mg/L	<0.00300	<0.00300	UDL	20	W147033	22-Nov-11	
EPA 200.8	Uranium	mg/L	<0.00100	<0.00100	<RL	20	W147033	22-Nov-11	
EPA 200.8	Thallium	mg/L	<0.00100	<0.00100	UDL	20	W147033	22-Nov-11	

Metals (Dissolved)

EPA 200.7	Aluminum	mg/L	<0.080	<0.080	<RL	20	W147015	28-Nov-11	
EPA 200.7	Barium	mg/L	0.0053	0.0051	3.0	20	W147015	28-Nov-11	
EPA 200.7	Beryllium	mg/L	<0.0020	<0.0020	UDL	20	W147015	28-Nov-11	
EPA 200.7	Boron	mg/L	<0.040	<0.040	UDL	20	W147015	28-Nov-11	
EPA 200.7	Cadmium	mg/L	<0.0020	<0.0020	UDL	20	W147015	28-Nov-11	
EPA 200.7	Calcium	mg/L	0.933	0.943	1.1	20	W147015	28-Nov-11	
EPA 200.7	Chromium	mg/L	<0.0060	<0.0060	<RL	20	W147015	28-Nov-11	
EPA 200.7	Cobalt	mg/L	<0.0060	<0.0060	UDL	20	W147015	28-Nov-11	
EPA 200.7	Copper	mg/L	<0.010	<0.010	UDL	20	W147015	28-Nov-11	
EPA 200.7	Iron	mg/L	<0.060	<0.060	UDL	20	W147015	28-Nov-11	
EPA 200.7	Lead	mg/L	<0.0075	<0.0075	UDL	20	W147015	28-Nov-11	
EPA 200.7	Magnesium	mg/L	1.77	1.78	0.9	20	W147015	28-Nov-11	
EPA 200.7	Manganese	mg/L	0.0153	0.0160	4.4	20	W147015	28-Nov-11	
EPA 200.7	Molybdenum	mg/L	<0.008	<0.008	UDL	20	W147015	28-Nov-11	
EPA 200.7	Nickel	mg/L	<0.010	<0.010	UDL	20	W147015	28-Nov-11	
EPA 200.7	Potassium	mg/L	<0.50	<0.50	<RL	20	W147015	28-Nov-11	
EPA 200.7	Silicon	mg/L	7.29	7.34	0.6	20	W147015	28-Nov-11	
EPA 200.7	Silver	mg/L	<0.0050	<0.0050	UDL	20	W147015	28-Nov-11	
EPA 200.7	Sodium	mg/L	4.46	4.44	0.4	20	W147015	28-Nov-11	
EPA 200.7	Titanium	mg/L	<0.0050	<0.0050	UDL	20	W147015	28-Nov-11	
EPA 200.7	Vanadium	mg/L	<0.0050	<0.0050	UDL	20	W147015	28-Nov-11	
EPA 200.7	Zinc	mg/L	0.0151	0.0148	1.7	20	W147015	28-Nov-11	
EPA 200.8	Antimony	mg/L	<0.00300	<0.00300	<RL	20	W147035	17-Nov-11	
EPA 200.8	Arsenic	mg/L	<0.0030	<0.0030	UDL	20	W147035	17-Nov-11	
EPA 200.8	Selenium	mg/L	<0.00300	<0.00300	<RL	20	W147035	17-Nov-11	
EPA 200.8	Thallium	mg/L	<0.00100	<0.00100	UDL	20	W147035	17-Nov-11	

Classical Chemistry Parameters

EPA 335.4	Cyanide (total)	mg/L	<0.0100	<0.0100	UDL	20	W147063	15-Nov-11	
EPA 350.1	Ammonia as N	mg/L	0.031	0.035	12.0	20	W147265	16-Nov-11	
EPA 353.2	Nitrate/Nitrite as N	mg/L	23.4	24.3	3.8	20	W147220	17-Nov-11	D2
SM 2320B/2310B	Total Alkalinity	mg/L	3.8	3.5	9.1	20	W147054	14-Nov-11	
SM 2320B/2310B	Total Alkalinity	mg/L	46.5	46.0	1.2	20	W147054	14-Nov-11	
SM 2320B/2310B	Total Alkalinity	mg/L	<1.0	<1.0	UDL	20	W147054	16-Nov-11	
SM 2320B/2310B	Bicarbonate	mg/L	3.8	3.5	9.1	20	W147054	14-Nov-11	
SM 2320B/2310B	Bicarbonate	mg/L	46.5	46.0	1.2	20	W147054	14-Nov-11	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011
Work Order: **W1K0270**
Reported: 06-Dec-11 12:26

Quality Control - DUPLICATE Data (Continued)

Method	Analyte	Units	Duplicate Result	Sample Result	RPD	RPD Limit	Batch ID	Analyzed	Notes
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Classical Chemistry Parameters (Continued)

SM 2320B/2310B	Bicarbonate	mg/L	<1.0	<1.0	UDL	20	W147054	16-Nov-11	
SM 2320B/2310B	Carbonate	mg/L	<1.0	<1.0	UDL	20	W147054	14-Nov-11	
SM 2320B/2310B	Carbonate	mg/L	<1.0	<1.0	UDL	20	W147054	14-Nov-11	
SM 2320B/2310B	Carbonate	mg/L	<1.0	<1.0	UDL	20	W147054	16-Nov-11	
SM 2540 C	Total Diss. Solids	mg/L	159	153		10	W147117	15-Nov-11	
SM 2540 D	Total Susp. Solids	mg/L	<5.0	<5.0	<RL	10	W147146	15-Nov-11	
SM 4500-CN-I	Cyanide (WAD)	mg/L	<0.0100	<0.0100	UDL	20	W147067	15-Nov-11	
SM 4500-P-E	Phosphorus	mg/L	0.015	0.016	9.0	20	W147404	18-Nov-11	

Anions by Ion Chromatography

EPA 300.0	Fluoride	mg/L	<0.10	<0.10	<RL	20	W148035	21-Nov-11	
EPA 300.0	Chloride	mg/L	22.6	22.8	0.9	20	W148035	21-Nov-11	D2
EPA 300.0	Sulfate as SO4	mg/L	14.6	14.6	0.6	20	W148035	21-Nov-11	

Quality Control - MATRIX SPIKE Data

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	mg/L	0.00122	<0.00020	0.00100	122	70 - 130	W147199	22-Nov-11	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	mg/L	8.41	1.95	1.00	646	70 - 130	W149244	06-Dec-11	M1
EPA 200.7	Barium	mg/L	1.04	0.0306	1.00	101	70 - 130	W149244	06-Dec-11	
EPA 200.7	Beryllium	mg/L	0.984	<0.0020	1.00	98.4	70 - 130	W149244	06-Dec-11	
EPA 200.7	Boron	mg/L	1.04	<0.040	1.00	102	70 - 130	W149244	06-Dec-11	
EPA 200.7	Cadmium	mg/L	0.978	<0.0020	1.00	97.7	70 - 130	W149244	06-Dec-11	
EPA 200.7	Calcium	mg/L	32.2	13.0	20.0	96.1	70 - 130	W149244	06-Dec-11	
EPA 200.7	Chromium	mg/L	0.998	<0.0060	1.00	99.5	70 - 130	W149244	06-Dec-11	
EPA 200.7	Cobalt	mg/L	0.975	<0.0060	1.00	97.3	70 - 130	W149244	06-Dec-11	
EPA 200.7	Copper	mg/L	1.00	<0.010	1.00	100	70 - 130	W149244	06-Dec-11	
EPA 200.7	Iron	mg/L	12.8	1.82	10.0	109	70 - 130	W149244	06-Dec-11	
EPA 200.7	Lead	mg/L	0.968	<0.0075	1.00	96.5	70 - 130	W149244	06-Dec-11	
EPA 200.7	Magnesium	mg/L	25.8	5.64	20.0	101	70 - 130	W149244	06-Dec-11	
EPA 200.7	Manganese	mg/L	1.47	0.481	1.00	98.8	70 - 130	W149244	06-Dec-11	
EPA 200.7	Molybdenum	mg/L	1.01	<0.008	1.00	100	70 - 130	W149244	06-Dec-11	
EPA 200.7	Nickel	mg/L	0.990	0.010	1.00	98.0	70 - 130	W149244	06-Dec-11	
EPA 200.7	Potassium	mg/L	21.4	0.93	20.0	102	70 - 130	W149244	06-Dec-11	
EPA 200.7	Silicon	mg/L	37.0	19.5	5.00	349	70 - 130	W149244	06-Dec-11	M1
EPA 200.7	Silver	mg/L	0.0514	<0.0050	0.0500	103	70 - 130	W149244	06-Dec-11	
EPA 200.7	Sodium	mg/L	46.3	27.6	19.0	98.4	70 - 130	W149244	06-Dec-11	
EPA 200.7	Titanium	mg/L	1.03	0.0074	1.00	102	70 - 130	W149244	06-Dec-11	
EPA 200.7	Vanadium	mg/L	1.01	<0.0050	1.00	101	70 - 130	W149244	06-Dec-11	
EPA 200.7	Zinc	mg/L	1.03	0.0620	1.00	96.7	70 - 130	W149244	06-Dec-11	
EPA 200.8	Antimony	mg/L	0.0267	<0.00300	0.0250	107	70 - 130	W147033	22-Nov-11	
EPA 200.8	Arsenic	mg/L	0.0250	<0.0030	0.0250	99.9	70 - 130	W147033	22-Nov-11	
EPA 200.8	Selenium	mg/L	0.0255	<0.00300	0.0250	102	70 - 130	W147033	22-Nov-11	
EPA 200.8	Uranium	mg/L	0.0246	<0.00100	0.0250	98.4	70 - 130	W147033	22-Nov-11	
EPA 200.8	Thallium	mg/L	0.0250	<0.00100	0.0250	100	70 - 130	W147033	22-Nov-11	

Metals (Dissolved)

EPA 200.7	Aluminum	mg/L	0.992	<0.080	1.00	96.9	70 - 130	W147015	28-Nov-11	
EPA 200.7	Aluminum	mg/L	1.13	0.133	1.00	99.7	70 - 130	W147015	28-Nov-11	
EPA 200.7	Barium	mg/L	1.01	0.0051	1.00	101	70 - 130	W147015	28-Nov-11	
EPA 200.7	Barium	mg/L	1.01	0.0094	1.00	100	70 - 130	W147015	28-Nov-11	

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Project Name: Suriname - Merian Gold 2011
Work Order: **W1K0270**
Reported: 06-Dec-11 12:26

Quality Control - MATRIX SPIKE Data (Continued)

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Dissolved) (Continued)

EPA 200.7	Beryllium	mg/L	0.976	<0.0020	1.00	97.6	70 - 130	W147015	28-Nov-11	
EPA 200.7	Beryllium	mg/L	0.987	<0.0020	1.00	98.7	70 - 130	W147015	28-Nov-11	
EPA 200.7	Boron	mg/L	0.994	<0.040	1.00	99.4	70 - 130	W147015	28-Nov-11	
EPA 200.7	Boron	mg/L	1.04	<0.040	1.00	104	70 - 130	W147015	28-Nov-11	
EPA 200.7	Cadmium	mg/L	0.947	<0.0020	1.00	94.7	70 - 130	W147015	28-Nov-11	
EPA 200.7	Cadmium	mg/L	0.956	<0.0020	1.00	95.6	70 - 130	W147015	28-Nov-11	
EPA 200.7	Calcium	mg/L	19.7	0.943	20.0	93.9	70 - 130	W147015	28-Nov-11	
EPA 200.7	Calcium	mg/L	392	372	20.0	98.4	70 - 130	W147015	28-Nov-11	M3
EPA 200.7	Chromium	mg/L	0.932	<0.0060	1.00	93.1	70 - 130	W147015	28-Nov-11	
EPA 200.7	Chromium	mg/L	0.956	<0.0060	1.00	95.3	70 - 130	W147015	28-Nov-11	
EPA 200.7	Cobalt	mg/L	0.942	<0.0060	1.00	94.2	70 - 130	W147015	28-Nov-11	
EPA 200.7	Cobalt	mg/L	0.948	<0.0060	1.00	94.8	70 - 130	W147015	28-Nov-11	
EPA 200.7	Copper	mg/L	0.970	<0.010	1.00	97.0	70 - 130	W147015	28-Nov-11	
EPA 200.7	Copper	mg/L	1.04	0.011	1.00	103	70 - 130	W147015	28-Nov-11	
EPA 200.7	Iron	mg/L	9.40	<0.060	10.0	94.0	70 - 130	W147015	28-Nov-11	
EPA 200.7	Iron	mg/L	9.72	<0.060	10.0	97.2	70 - 130	W147015	28-Nov-11	
EPA 200.7	Lead	mg/L	0.952	<0.0075	1.00	95.2	70 - 130	W147015	28-Nov-11	
EPA 200.7	Lead	mg/L	0.940	<0.0075	1.00	94.0	70 - 130	W147015	28-Nov-11	
EPA 200.7	Magnesium	mg/L	21.3	1.78	20.0	97.5	70 - 130	W147015	28-Nov-11	
EPA 200.7	Magnesium	mg/L	20.2	0.174	20.0	100	70 - 130	W147015	28-Nov-11	
EPA 200.7	Manganese	mg/L	0.965	0.0160	1.00	94.9	70 - 130	W147015	28-Nov-11	
EPA 200.7	Manganese	mg/L	0.981	<0.0040	1.00	98.1	70 - 130	W147015	28-Nov-11	
EPA 200.7	Molybdenum	mg/L	0.957	<0.008	1.00	95.5	70 - 130	W147015	28-Nov-11	
EPA 200.7	Molybdenum	mg/L	1.40	0.380	1.00	102	70 - 130	W147015	28-Nov-11	
EPA 200.7	Nickel	mg/L	0.885	<0.010	1.00	88.5	70 - 130	W147015	28-Nov-11	
EPA 200.7	Nickel	mg/L	0.902	<0.010	1.00	90.2	70 - 130	W147015	28-Nov-11	
EPA 200.7	Potassium	mg/L	19.7	<0.50	20.0	97.1	70 - 130	W147015	28-Nov-11	
EPA 200.7	Potassium	mg/L	50.0	30.5	20.0	97.4	70 - 130	W147015	28-Nov-11	
EPA 200.7	Silicon	mg/L	12.2	7.34	5.00	96.7	70 - 130	W147015	28-Nov-11	
EPA 200.7	Silicon	mg/L	7.03	1.85	5.00	104	70 - 130	W147015	28-Nov-11	
EPA 200.7	Silver	mg/L	0.0468	<0.0050	0.0500	93.5	70 - 130	W147015	28-Nov-11	
EPA 200.7	Silver	mg/L	0.0321	<0.0050	0.0500	64.2	70 - 130	W147015	28-Nov-11	M2
EPA 200.7	Sodium	mg/L	22.9	4.44	19.0	97.3	70 - 130	W147015	28-Nov-11	
EPA 200.7	Sodium	mg/L	38.9	20.6	19.0	96.5	70 - 130	W147015	28-Nov-11	
EPA 200.7	Titanium	mg/L	0.957	<0.0050	1.00	95.7	70 - 130	W147015	28-Nov-11	
EPA 200.7	Titanium	mg/L	0.975	<0.0050	1.00	97.3	70 - 130	W147015	28-Nov-11	
EPA 200.7	Vanadium	mg/L	0.940	<0.0050	1.00	94.0	70 - 130	W147015	28-Nov-11	
EPA 200.7	Vanadium	mg/L	0.986	<0.0050	1.00	98.3	70 - 130	W147015	28-Nov-11	
EPA 200.7	Zinc	mg/L	0.981	0.0148	1.00	96.7	70 - 130	W147015	28-Nov-11	
EPA 200.7	Zinc	mg/L	0.977	<0.0100	1.00	97.2	70 - 130	W147015	28-Nov-11	
EPA 200.8	Antimony	mg/L	0.0250	<0.00300	0.0250	99.2	70 - 130	W147035	17-Nov-11	
EPA 200.8	Antimony	mg/L	0.0237	<0.00300	0.0250	93.8	70 - 130	W147035	17-Nov-11	
EPA 200.8	Arsenic	mg/L	0.0285	<0.0030	0.0250	114	70 - 130	W147035	17-Nov-11	
EPA 200.8	Arsenic	mg/L	0.0281	<0.0030	0.0250	112	70 - 130	W147035	17-Nov-11	
EPA 200.8	Selenium	mg/L	0.0310	<0.00300	0.0250	119	70 - 130	W147035	17-Nov-11	
EPA 200.8	Selenium	mg/L	0.0301	<0.00300	0.0250	120	70 - 130	W147035	17-Nov-11	
EPA 200.8	Thallium	mg/L	0.0249	<0.00100	0.0250	99.4	70 - 130	W147035	17-Nov-11	
EPA 200.8	Thallium	mg/L	0.0249	<0.00100	0.0250	99.4	70 - 130	W147035	17-Nov-11	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	mg/L	0.102	<0.005	0.100	102	85 - 115	W147060	15-Nov-11	
EPA 335.4	Cyanide (total)	mg/L	0.103	<0.0100	0.100	103	90 - 110	W147063	15-Nov-11	
EPA 335.4	Cyanide (total)	mg/L	0.101	<0.0100	0.100	101	90 - 110	W147063	15-Nov-11	
EPA 350.1	Ammonia as N	mg/L	0.528	0.035	0.500	98.6	90 - 110	W147265	17-Nov-11	
EPA 353.2	Nitrate/Nitrite as N	mg/L	24.6	24.3	1.00	R > 4S	90 - 110	W147220	17-Nov-11	D2,M3
EPA 353.2	Nitrate/Nitrite as N	mg/L	3.94	2.92	1.00	102	90 - 110	W147220	17-Nov-11	
SM 4500-CN-I	Cyanide (WAD)	mg/L	0.105	<0.0100	0.100	105	75 - 125	W147067	15-Nov-11	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



Golder Associates (WA)
 18300 NE Union Hill Road, Suite 200
 Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011
 Work Order: **W1K0270**
 Reported: 06-Dec-11 12:26

Quality Control - MATRIX SPIKE Data (Continued)

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Classical Chemistry Parameters (Continued)

SM 4500-CN-I	Cyanide (WAD)	mg/L	0.103	<0.0100	0.100	103	75 - 125	W147067	15-Nov-11	
SM 4500-P-E	Phosphorus	mg/L	0.526	0.016	0.500	102	75 - 125	W147404	18-Nov-11	

Anions by Ion Chromatography

EPA 300.0	Fluoride	mg/L	2.25	<0.10	2.00	108	90 - 110	W148035	21-Nov-11	
EPA 300.0	Fluoride	mg/L	3.06	0.78	2.00	114	90 - 110	W148035	21-Nov-11	M1
EPA 300.0	Chloride	mg/L	26.4	22.8	3.00	R > 4S	90 - 110	W148035	21-Nov-11	D2,M3
EPA 300.0	Chloride	mg/L	115	114	3.00	R > 4S	90 - 110	W148035	21-Nov-11	D2,M3
EPA 300.0	Sulfate as SO4	mg/L	25.7	14.6	10.0	110	90 - 110	W148035	21-Nov-11	
EPA 300.0	Sulfate as SO4	mg/L	214	204	10.0	99.2	90 - 110	W148035	21-Nov-11	D2,M3

Quality Control - MATRIX SPIKE DUPLICATE Data

Method	Analyte	Units	MSD Result	Spike Result	Spike Level	RPD	RPD Limit	Batch ID	Analyzed	Notes
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Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	mg/L	0.108	0.102	0.100	6.2	20	W147060	15-Nov-11	
SM 4500-P-E	Phosphorus	mg/L	0.524	0.526	0.500	0.4	20	W147404	18-Nov-11	

Quality Control - POST DIGESTION SPIKE Data

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	mg/L	3.42	1.95	1.00	147	85 - 115	W149244	06-Dec-11	M1
EPA 200.7	Silicon	mg/L	24.5	19.5	5.00	101	85 - 115	W149244	06-Dec-11	

Metals (Dissolved)

EPA 200.7	Silver	mg/L	0.0417	<0.0050	0.0500	83.4	85 - 115	W147015	28-Nov-11	M2
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Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011
Work Order: **W1K0270**
Reported: 06-Dec-11 12:26

Notes and Definitions

- D2 Sample required dilution due to high concentration of target analyte.
 - H3 Sample was received and analyzed past holding time.
 - M1 Matrix spike recovery was high, but the LCS recovery was acceptable.
 - M2 Matrix spike recovery was low, but the LCS recovery was acceptable.
 - M3 The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to spike level. The LCS was acceptable.
 - Q5 Sample was received with inadequate preservation, but preserved by the laboratory.
 - LCS Laboratory Control Sample (Blank Spike)
 - RPD Relative Percent Difference
 - UDL A result is less than the detection limit
 - R > 4S % recovery not applicable, sample concentration more than four times greater than spike level
 - <RL A result is less than the reporting limit
 - MRL Method Reporting Limit
 - MDL Method Detection Limit
 - N/A Not Applicable
-



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: W1L0358

Reported: 05-Jan-12 11:40

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Sampled By	Date Received
TSF-PZ5	W1L0358-01	Ground Water	08-Dec-11 13:46	GM	19-Dec-2011
TSF-TW-5-DUP	W1L0358-02	Ground Water	08-Dec-11 13:46	GM	19-Dec-2011
M2-PZ1-TW	W1L0358-03	Ground Water	12-Dec-11 17:20	GM	19-Dec-2011
MA-PZ6-TW	W1L0358-04	Ground Water	11-Dec-11 14:20	GM	19-Dec-2011
TSF-MW-1	W1L0358-05	Ground Water	13-Dec-11 15:35	GM	19-Dec-2011
TSF-TW-3	W1L0358-06	Ground Water	13-Dec-11 12:40	GM	19-Dec-2011
MA-PZ1-TW1-R	W1L0358-07	Ground Water	12-Dec-11 12:50	GM	19-Dec-2011
TSF-PZ-8-E	W1L0358-08	Ground Water	14-Dec-11 10:50	PN	19-Dec-2011
TSF-PZ-8-F	W1L0358-09	Ground Water	14-Dec-11 10:20	PN	19-Dec-2011

Solid samples are analyzed on an as-received, wet-weight basis, unless otherwise requested. Non-Detects are reported at the MDL.

Sample preparation is defined by the client as per their Data Quality Objectives.

This report supercedes any previous reports for this Work Order. The complete report includes pages for each sample, a full QC report, and a notes section.

The results presented in this report relate only to the samples, and meet all requirements of the NELAC Standards unless otherwise noted.

(Q6) SVL received the following containers outside of published EPA guidelines for preservation temperatures (0-6°C).

The guidelines do not pertain to nitric-preserved metals.

Cooler 1 (Received Temperature: 10.4°C)

Labnumber	Container	Client ID	Labnumber	Container	Client ID
W1L0358-01 A	Raw HDPE	TSF-PZ5	W1L0358-01 B	Nitric HDPE	TSF-PZ5
W1L0358-01 D	Filtered nitric HDPE	TSF-PZ5	W1L0358-01 F	Sulfuric HDPE	TSF-PZ5
W1L0358-01 G	NaOH HDPE	TSF-PZ5	W1L0358-02 A	Raw HDPE	TSF-TW-5-DUP
W1L0358-02 B	Nitric HDPE	TSF-TW-5-DUP	W1L0358-02 D	Filtered nitric HDPE	TSF-TW-5-DUP
W1L0358-02 F	Sulfuric HDPE	TSF-TW-5-DUP	W1L0358-02 G	NaOH HDPE	TSF-TW-5-DUP
W1L0358-02 H	NaOH HDPE	TSF-TW-5-DUP	W1L0358-03 A	Raw HDPE	M2-PZ1-TW
W1L0358-03 B	Nitric HDPE	M2-PZ1-TW	W1L0358-03 C	Nitric HDPE	M2-PZ1-TW
W1L0358-03 D	Filtered nitric HDPE	M2-PZ1-TW	W1L0358-03 E	Filtered nitric HDPE	M2-PZ1-TW
W1L0358-03 F	Sulfuric HDPE	M2-PZ1-TW	W1L0358-03 G	NaOH HDPE	M2-PZ1-TW
W1L0358-03 H	Raw HDPE	M2-PZ1-TW	W1L0358-03 I	Sulfuric HDPE	M2-PZ1-TW

Cooler 2 (Received Temperature: 9.8°C)

Labnumber	Container	Client ID	Labnumber	Container	Client ID
W1L0358-04 A	Raw HDPE	MA-PZ6-TW	W1L0358-04 B	Nitric HDPE	MA-PZ6-TW
W1L0358-04 C	Nitric HDPE	MA-PZ6-TW	W1L0358-04 D	Filtered nitric HDPE	MA-PZ6-TW
W1L0358-04 E	Filtered nitric HDPE	MA-PZ6-TW	W1L0358-04 F	Sulfuric HDPE	MA-PZ6-TW
W1L0358-04 G	NaOH HDPE	MA-PZ6-TW	W1L0358-04 H	Raw HDPE	MA-PZ6-TW
W1L0358-04 I	Sulfuric HDPE	MA-PZ6-TW	W1L0358-05 A	Raw HDPE	TSF-MW-1
W1L0358-05 B	Raw HDPE	TSF-MW-1	W1L0358-05 C	Nitric HDPE	TSF-MW-1
W1L0358-05 D	Filtered nitric HDPE	TSF-MW-1	W1L0358-05 E	Filtered nitric HDPE	TSF-MW-1
W1L0358-05 F	Sulfuric HDPE	TSF-MW-1	W1L0358-05 G	NaOH HDPE	TSF-MW-1

Cooler 3 (Received Temperature: 9.6°C)

Labnumber	Container	Client ID	Labnumber	Container	Client ID
W1L0358-06 A	Raw HDPE	TSF-TW-3	W1L0358-06 B	Nitric HDPE	TSF-TW-3
W1L0358-06 C	Nitric HDPE	TSF-TW-3	W1L0358-06 D	Filtered nitric HDPE	TSF-TW-3
W1L0358-06 E	Filtered nitric HDPE	TSF-TW-3	W1L0358-06 F	Sulfuric HDPE	TSF-TW-3
W1L0358-06 G	NaOH HDPE	TSF-TW-3	W1L0358-06 H	Raw HDPE	TSF-TW-3
W1L0358-07 A	Raw HDPE	MA-PZ1-TW1-R	W1L0358-07 B	Nitric HDPE	MA-PZ1-TW1-R
W1L0358-07 C	Nitric HDPE	MA-PZ1-TW1-R	W1L0358-07 D	Filtered nitric HDPE	MA-PZ1-TW1-R
W1L0358-07 E	Filtered nitric HDPE	MA-PZ1-TW1-R	W1L0358-07 F	Sulfuric HDPE	MA-PZ1-TW1-R
W1L0358-07 G	NaOH HDPE	MA-PZ1-TW1-R	W1L0358-07 H	Raw HDPE	MA-PZ1-TW1-R
W1L0358-08 A	Raw HDPE	TSF-PZ-8-E	W1L0358-08 B	Nitric HDPE	TSF-PZ-8-E

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



One Government Gulch - PO Box 929

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Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0358**

Reported: 05-Jan-12 11:40

Cooler 3 (Received Temperature: 9.6°C) (Continued)

<u>Labnumber</u>	<u>Container</u>	<u>Client ID</u>	<u>Labnumber</u>	<u>Container</u>	<u>Client ID</u>
W1L0358-08 C	Nitric HDPE	TSF-PZ-8-E	W1L0358-08 D	Filtered nitric HDPE	TSF-PZ-8-E
W1L0358-08 E	Filtered nitric HDPE	TSF-PZ-8-E	W1L0358-08 F	Sulfuric HDPE	TSF-PZ-8-E
W1L0358-08 G	NaOH HDPE	TSF-PZ-8-E	W1L0358-08 H	Raw HDPE	TSF-PZ-8-E
W1L0358-09 A	Raw HDPE	TSF-PZ-8-F	W1L0358-09 B	Nitric HDPE	TSF-PZ-8-F
W1L0358-09 C	Nitric HDPE	TSF-PZ-8-F	W1L0358-09 D	Filtered nitric HDPE	TSF-PZ-8-F
W1L0358-09 E	Filtered nitric HDPE	TSF-PZ-8-F	W1L0358-09 F	Sulfuric HDPE	TSF-PZ-8-F
W1L0358-09 G	NaOH HDPE	TSF-PZ-8-F	W1L0358-09 H	Raw HDPE	TSF-PZ-8-F



Golder Associates (WA)
 18300 NE Union Hill Road, Suite 200
 Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0358**

Reported: 05-Jan-12 11:40

Client Sample ID: **TSF-PZ5**

SVL Sample ID: **W1L0358-01 (Ground Water)**

Sample Report Page 1 of 3

Sampled: 08-Dec-11 13:46

Received: 19-Dec-11

Sampled By: GM

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W153118	DJA	01/03/12 09:23	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	0.305	mg/L	0.080	0.008		W152131	TJK	01/03/12 12:10	
EPA 200.7	Barium	0.0132	mg/L	0.0020	0.0002		W152131	TJK	01/03/12 12:11	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0002		W152131	TJK	01/03/12 12:10	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W152131	TJK	01/03/12 12:10	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0002		W152131	TJK	01/03/12 12:11	
EPA 200.7	Calcium	4.22	mg/L	0.040	0.006		W152131	TJK	01/03/12 12:09	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0003		W152131	TJK	01/03/12 12:11	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W152131	TJK	01/03/12 12:11	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.002		W152131	TJK	01/03/12 12:11	
EPA 200.7	Iron	0.287	mg/L	0.060	0.008		W152131	TJK	01/03/12 12:10	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0017		W152131	TJK	01/03/12 12:11	
EPA 200.7	Magnesium	6.60	mg/L	0.060	0.010		W152131	TJK	01/03/12 12:10	
EPA 200.7	Manganese	0.104	mg/L	0.0040	0.0006		W152131	TJK	01/03/12 12:10	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.0006		W152131	TJK	01/03/12 12:11	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W152131	TJK	01/03/12 12:11	
EPA 200.7	Potassium	1.37	mg/L	0.50	0.03		W152131	TJK	01/03/12 12:09	
EPA 200.7	Silicon	25.3	mg/L	0.08	0.01		W152131	TJK	01/03/12 12:09	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0003		W152131	TJK	01/03/12 12:11	
EPA 200.7	Sodium	21.3	mg/L	0.50	0.02		W152131	TJK	01/03/12 12:09	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0002		W152131	TJK	01/03/12 12:11	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0002		W152131	TJK	01/03/12 12:11	
EPA 200.7	Zinc	0.0459	mg/L	0.0100	0.0010		W152131	TJK	01/03/12 12:11	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00009	2.5	W152144	KWH	12/27/11 12:24	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0006	2.5	W152144	KWH	12/27/11 12:24	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00070	2.5	W152144	KWH	12/27/11 12:24	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000015	2.5	W152144	KWH	12/27/11 12:24	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000011	2.5	W152144	KWH	12/27/11 12:24	
SM 2340B	Hardness (as CaCO3)	36.1	mg/L	0.347	0.116		N/A		01/01/12 11:58	



Golder Associates (WA)
 18300 NE Union Hill Road, Suite 200
 Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0358**

Reported: 05-Jan-12 11:40

Client Sample ID: **TSF-PZ5**

SVL Sample ID: **W1L0358-01 (Ground Water)**

Sample Report Page 2 of 3

Sampled: 08-Dec-11 13:46

Received: 19-Dec-11

Sampled By: GM

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.016		W152073	AS	01/01/12 11:58	
EPA 200.7	Barium	0.0120	mg/L	0.0020	0.0004		W152073	AS	01/01/12 12:00	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0004		W152073	AS	01/01/12 11:58	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W152073	AS	01/01/12 11:58	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W152073	AS	01/01/12 12:00	
EPA 200.7	Calcium	3.90	mg/L	0.040	0.012		W152073	AS	01/01/12 11:58	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W152073	AS	01/01/12 12:00	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W152073	AS	01/01/12 12:00	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.003		W152073	AS	01/01/12 11:59	
EPA 200.7	Iron	0.084	mg/L	0.060	0.017		W152073	AS	01/01/12 11:58	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0034		W152073	AS	01/01/12 12:00	
EPA 200.7	Magnesium	6.41	mg/L	0.060	0.021		W152073	AS	01/01/12 11:58	
EPA 200.7	Manganese	0.0933	mg/L	0.0040	0.0011		W152073	AS	01/01/12 11:58	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W152073	AS	01/01/12 12:00	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W152073	AS	01/01/12 12:00	
EPA 200.7	Potassium	1.63	mg/L	0.50	0.07		W152073	TJK	12/30/11 13:06	
EPA 200.7	Silicon	23.9	mg/L	0.08	0.03		W152073	AS	01/01/12 11:58	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0005		W152073	AS	01/01/12 11:59	
EPA 200.7	Sodium	23.4	mg/L	0.50	0.04		W152073	AS	01/01/12 11:58	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W152073	AS	01/01/12 11:59	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W152073	AS	01/01/12 11:59	
EPA 200.7	Zinc	0.0391	mg/L	0.0100	0.0021		W152073	AS	01/01/12 12:00	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00007		W152078	KWH	12/28/11 08:02	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0005		W152078	KWH	12/28/11 08:02	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00056		W152078	KWH	12/28/11 08:02	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000012		W152078	KWH	12/28/11 08:02	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0009		W152125	CFF	12/21/11 11:33	Q5
EPA 120.1	Specific conductance	169	µmhos/cm	5.00			W152085	JMS	12/20/11 12:31	
EPA 180.1	Turbidity	4.58	NTU	0.100			W152068	SM	12/20/11 10:20	H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0024		W152129	CFF	12/21/11 14:52	
EPA 350.1	Ammonia as N	0.196	mg/L	0.030	0.009		W153120	RHW	01/03/12 15:50	
EPA 353.2	Nitrate/Nitrite as N	0.098	mg/L	0.050	0.015		W201034	RHW	01/04/12 14:45	
SM 2320B/2310B	Bicarbonate	69.6	mg/L	1.0	0.5		W152091	DKS	12/20/11 09:28	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.5		W152091	DKS	12/20/11 09:28	
SM 2320B/2310B	Total Alkalinity	69.6	mg/L	1.0	0.5		W152091	DKS	12/20/11 09:28	
SM 2540 C	Total Diss. Solids	138	mg/L	20			W152087	JMS	12/20/11 14:00	H3
SM 2540 D	Total Susp. Solids	18.0	mg/L	10.0			W152086	JMS	12/20/11 14:00	H3
SM 4500 H B	pH @22.0°C	6.53	pH Units				W152091	DKS	12/20/11 09:28	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0013		W152228	CFF	12/23/11 12:28	H1
SM 4500-P-E	Phosphorus	0.290	mg/L	0.010	0.004		W153169	SM	12/30/11 14:33	



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

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Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0358**

Reported: 05-Jan-12 11:40

Client Sample ID: **TSF-PZ5**

SVL Sample ID: **W1L0358-01 (Ground Water)**

Sample Report Page 3 of 3

Sampled: 08-Dec-11 13:46

Received: 19-Dec-11

Sampled By: GM

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	7.47	mg/L	0.20	0.07		W152159	DT	12/21/11 16:59	
EPA 300.0	Fluoride	0.10	mg/L	0.10	0.02		W152159	DT	12/21/11 16:59	
EPA 300.0	Sulfate as SO4	8.54	mg/L	0.30	0.04		W152159	DT	12/21/11 16:59	

Cation/Anion Balance and TDS Ratios

Cation Sum: 1.71 meq/L Anion Sum: 1.79 meq/L C/A Balance: -2.41 % Calculated TDS: 159 TDS/cTDS: 0.87 TDS/eC: 0.82

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Kirby Gray
Technical Director



Golder Associates (WA)
 18300 NE Union Hill Road, Suite 200
 Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0358**

Reported: 05-Jan-12 11:40

Client Sample ID: **TSF-TW-5-DUP**

SVL Sample ID: **W1L0358-02 (Ground Water)**

Sample Report Page 1 of 3

Sampled: 08-Dec-11 13:46

Received: 19-Dec-11

Sampled By: GM

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W153118	DJA	01/03/12 09:24	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	0.575	mg/L	0.080	0.008		W152131	TJK	01/03/12 12:27	
EPA 200.7	Barium	0.0136	mg/L	0.0020	0.0002		W152131	TJK	01/03/12 12:28	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0002		W152131	TJK	01/03/12 12:27	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W152131	TJK	01/03/12 12:27	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0002		W152131	TJK	01/03/12 12:28	
EPA 200.7	Calcium	4.28	mg/L	0.040	0.006		W152131	TJK	01/03/12 12:26	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0003		W152131	TJK	01/03/12 12:28	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W152131	TJK	01/03/12 12:28	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.002		W152131	TJK	01/03/12 12:28	
EPA 200.7	Iron	0.492	mg/L	0.060	0.008		W152131	TJK	01/03/12 12:27	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0017		W152131	TJK	01/03/12 12:28	
EPA 200.7	Magnesium	6.73	mg/L	0.060	0.010		W152131	TJK	01/03/12 12:27	
EPA 200.7	Manganese	0.107	mg/L	0.0040	0.0006		W152131	TJK	01/03/12 12:27	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.0006		W152131	TJK	01/03/12 12:28	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W152131	TJK	01/03/12 12:28	
EPA 200.7	Potassium	1.39	mg/L	0.50	0.03		W152131	TJK	01/03/12 12:26	
EPA 200.7	Silicon	26.0	mg/L	0.08	0.01		W152131	TJK	01/03/12 12:26	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0003		W152131	TJK	01/03/12 12:28	
EPA 200.7	Sodium	21.5	mg/L	0.50	0.02		W152131	TJK	01/03/12 12:26	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0002		W152131	TJK	01/03/12 12:28	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0002		W152131	TJK	01/03/12 12:28	
EPA 200.7	Zinc	0.0468	mg/L	0.0100	0.0010		W152131	TJK	01/03/12 12:28	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00009	2.5	W152144	KWH	12/27/11 12:31	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0006	2.5	W152144	KWH	12/27/11 12:31	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00070	2.5	W152144	KWH	12/27/11 12:31	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000015	2.5	W152144	KWH	12/27/11 12:31	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000011	2.5	W152144	KWH	12/27/11 12:31	
SM 2340B	Hardness (as CaCO3)	35.2	mg/L	0.347	0.116		N/A		01/01/12 12:04	



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: **Suriname - Merian Gold 2011 / 113-93245**

Work Order: **W1L0358**

Reported: 05-Jan-12 11:40

Client Sample ID: **TSF-TW-5-DUP**

SVL Sample ID: **W1L0358-02 (Ground Water)**

Sample Report Page 2 of 3

Sampled: 08-Dec-11 13:46

Received: 19-Dec-11

Sampled By: GM

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.016		W152073	AS	01/01/12 12:04	
EPA 200.7	Barium	0.0116	mg/L	0.0020	0.0004		W152073	AS	01/01/12 12:05	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0004		W152073	AS	01/01/12 12:04	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W152073	AS	01/01/12 12:04	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W152073	AS	01/01/12 12:05	
EPA 200.7	Calcium	3.76	mg/L	0.040	0.012		W152073	AS	01/01/12 12:04	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W152073	AS	01/01/12 12:05	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W152073	AS	01/01/12 12:05	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.003		W152073	AS	01/01/12 12:05	
EPA 200.7	Iron	0.079	mg/L	0.060	0.017		W152073	AS	01/01/12 12:04	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0034		W152073	AS	01/01/12 12:05	
EPA 200.7	Magnesium	6.26	mg/L	0.060	0.021		W152073	AS	01/01/12 12:04	
EPA 200.7	Manganese	0.0898	mg/L	0.0040	0.0011		W152073	AS	01/01/12 12:04	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W152073	AS	01/01/12 12:05	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W152073	AS	01/01/12 12:05	
EPA 200.7	Potassium	1.59	mg/L	0.50	0.07		W152073	TJK	12/30/11 13:12	
EPA 200.7	Silicon	23.7	mg/L	0.08	0.03		W152073	AS	01/01/12 12:04	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0005		W152073	AS	01/01/12 12:05	
EPA 200.7	Sodium	23.2	mg/L	0.50	0.04		W152073	AS	01/01/12 12:04	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W152073	AS	01/01/12 12:05	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W152073	AS	01/01/12 12:05	
EPA 200.7	Zinc	0.0367	mg/L	0.0100	0.0021		W152073	AS	01/01/12 12:05	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00007		W152078	KWH	12/28/11 08:20	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0005		W152078	KWH	12/28/11 08:20	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00056		W152078	KWH	12/28/11 08:20	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000012		W152078	KWH	12/28/11 08:20	
Classical Chemistry Parameters										
ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0009		W152125	CFF	12/21/11 11:35	
EPA 120.1	Specific conductance	156	µmhos/cm	5.00			W152085	JMS	12/20/11 12:31	
EPA 180.1	Turbidity	4.32	NTU	0.100			W152068	SM	12/20/11 10:20	H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0024		W152129	CFF	12/21/11 14:54	
EPA 350.1	Ammonia as N	0.188	mg/L	0.030	0.009		W153120	RHW	01/03/12 15:51	
EPA 353.2	Nitrate/Nitrite as N	0.080	mg/L	0.050	0.015		W201034	RHW	01/04/12 14:47	
SM 2320B/2310B	Bicarbonate	69.0	mg/L	1.0	0.5		W152091	DKS	12/20/11 09:33	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.5		W152091	DKS	12/20/11 09:33	
SM 2320B/2310B	Total Alkalinity	69.0	mg/L	1.0	0.5		W152091	DKS	12/20/11 09:33	
SM 2540 C	Total Diss. Solids	80	mg/L	20			W152087	JMS	12/20/11 14:00	H3
SM 2540 D	Total Susp. Solids	20.0	mg/L	10.0			W152086	JMS	12/20/11 14:00	H3
SM 4500 H B	pH @21.0°C	6.52	pH Units				W152091	DKS	12/20/11 09:33	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0013		W152228	CFF	12/23/11 12:30	H1
SM 4500-P-E	Phosphorus	0.261	mg/L	0.010	0.004		W153169	SM	12/30/11 14:33	



One Government Gulch - PO Box 929

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Golder Associates (WA)
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Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0358**

Reported: 05-Jan-12 11:40

Client Sample ID: **TSF-TW-5-DUP**

SVL Sample ID: **W1L0358-02 (Ground Water)**

Sample Report Page 3 of 3

Sampled: 08-Dec-11 13:46

Received: 19-Dec-11

Sampled By: GM

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	7.47	mg/L	0.20	0.07		W152159	DT	12/21/11 17:24	
EPA 300.0	Fluoride	< 0.10	mg/L	0.10	0.02		W152159	DT	12/21/11 17:24	
EPA 300.0	Sulfate as SO4	8.66	mg/L	0.30	0.04		W152159	DT	12/21/11 17:24	

Cation/Anion Balance and TDS Ratios

Cation Sum: 1.70 meq/L Anion Sum: 1.78 meq/L C/A Balance: -2.31 % Calculated TDS: 160 TDS/cTDS: 0.50 TDS/eC: 0.51

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Kirby Gray
Technical Director



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: W1L0358

Reported: 05-Jan-12 11:40

Client Sample ID: M2-PZ1-TW

SVL Sample ID: W1L0358-03 (Ground Water)

Sample Report Page 1 of 3

Sampled: 12-Dec-11 17:20
Received: 19-Dec-11
Sampled By: GM

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W153118	DJA	01/03/12 09:32	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	0.545	mg/L	0.080	0.008		W152131	TJK	01/03/12 12:32	
EPA 200.7	Barium	0.172	mg/L	0.0020	0.0002		W152131	TJK	01/03/12 12:34	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0002		W152131	TJK	01/03/12 12:32	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W152131	TJK	01/03/12 12:32	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0002		W152131	TJK	01/03/12 12:34	
EPA 200.7	Calcium	39.6	mg/L	0.040	0.006		W152131	TJK	01/03/12 12:32	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0003		W152131	TJK	01/03/12 12:34	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W152131	TJK	01/03/12 12:34	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.002		W152131	TJK	01/03/12 12:34	
EPA 200.7	Iron	1.28	mg/L	0.060	0.008		W152131	TJK	01/03/12 12:32	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0017		W152131	TJK	01/03/12 12:34	
EPA 200.7	Magnesium	18.7	mg/L	0.060	0.010		W152131	TJK	01/03/12 12:32	
EPA 200.7	Manganese	1.20	mg/L	0.0040	0.0006		W152131	TJK	01/03/12 12:32	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.0006		W152131	TJK	01/03/12 12:34	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W152131	TJK	01/03/12 12:34	
EPA 200.7	Potassium	0.85	mg/L	0.50	0.03		W152131	TJK	01/03/12 12:32	
EPA 200.7	Silicon	23.4	mg/L	0.08	0.01		W152131	TJK	01/03/12 12:32	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0003		W152131	TJK	01/03/12 12:34	
EPA 200.7	Sodium	22.1	mg/L	0.50	0.02		W152131	TJK	01/03/12 12:32	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0002		W152131	TJK	01/03/12 12:34	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0002		W152131	TJK	01/03/12 12:34	
EPA 200.7	Zinc	0.295	mg/L	0.0100	0.0010		W152131	TJK	01/03/12 12:34	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00009	2.5	W152144	KWH	12/27/11 12:33	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0006	2.5	W152144	KWH	12/27/11 12:33	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00070	2.5	W152144	KWH	12/27/11 12:33	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000015	2.5	W152144	KWH	12/27/11 12:33	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000011	2.5	W152144	KWH	12/27/11 12:33	
SM 2340B	Hardness (as CaCO3)	174	mg/L	0.347	0.116		N/A		01/01/12 12:22	



Golder Associates (WA)
 18300 NE Union Hill Road, Suite 200
 Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0358**

Reported: 05-Jan-12 11:40

Client Sample ID: **M2-PZ1-TW**

SVL Sample ID: **W1L0358-03 (Ground Water)**

Sample Report Page 2 of 3

Sampled: 12-Dec-11 17:20

Received: 19-Dec-11

Sampled By: GM

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.016		W152073	AS	01/01/12 12:22	
EPA 200.7	Barium	0.169	mg/L	0.0020	0.0004		W152073	AS	01/01/12 12:23	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0004		W152073	AS	01/01/12 12:22	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W152073	AS	01/01/12 12:22	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W152073	AS	01/01/12 12:23	
EPA 200.7	Calcium	38.9	mg/L	0.040	0.012		W152073	AS	01/01/12 12:22	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W152073	AS	01/01/12 12:23	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W152073	AS	01/01/12 12:23	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.003		W152073	AS	01/01/12 12:23	
EPA 200.7	Iron	0.509	mg/L	0.060	0.017		W152073	AS	01/01/12 12:22	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0034		W152073	AS	01/01/12 12:23	
EPA 200.7	Magnesium	18.6	mg/L	0.060	0.021		W152073	AS	01/01/12 12:22	
EPA 200.7	Manganese	1.17	mg/L	0.0040	0.0011		W152073	AS	01/01/12 12:22	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W152073	AS	01/01/12 12:23	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W152073	AS	01/01/12 12:23	
EPA 200.7	Potassium	1.02	mg/L	0.50	0.07		W152073	TJK	12/30/11 13:17	
EPA 200.7	Silicon	21.5	mg/L	0.08	0.03		W152073	AS	01/01/12 12:22	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0005		W152073	AS	01/01/12 12:23	
EPA 200.7	Sodium	24.1	mg/L	0.50	0.04		W152073	AS	01/01/12 12:22	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W152073	AS	01/01/12 12:23	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W152073	AS	01/01/12 12:23	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0021		W152073	AS	01/01/12 12:23	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00007		W152078	KWH	12/28/11 08:26	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0005		W152078	KWH	12/28/11 08:26	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00056		W152078	KWH	12/28/11 08:26	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000012		W152078	KWH	12/28/11 08:26	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0009		W152277	CFE	12/23/11 11:35	N3
EPA 120.1	Specific conductance	418	µmhos/cm	5.00			W152085	JMS	12/20/11 12:31	
EPA 180.1	Turbidity	27.0	NTU	0.100			W152068	SM	12/20/11 10:20	H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0024		W152129	CFE	12/21/11 14:56	
EPA 350.1	Ammonia as N	< 0.030	mg/L	0.030	0.009		W153120	RHW	01/03/12 15:53	Q5
EPA 353.2	Nitrate/Nitrite as N	< 0.050	mg/L	0.050	0.015		W201034	RHW	01/04/12 14:48	
SM 2320B/2310B	Bicarbonate	227	mg/L	1.0	0.5		W152091	DKS	12/20/11 09:37	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.5		W152091	DKS	12/20/11 09:37	
SM 2320B/2310B	Total Alkalinity	227	mg/L	1.0	0.5		W152091	DKS	12/20/11 09:37	
SM 2540 C	Total Diss. Solids	200	mg/L	20			W152087	JMS	12/20/11 14:00	H3
SM 2540 D	Total Susp. Solids	64.0	mg/L	10.0			W152086	JMS	12/20/11 14:00	H3
SM 4500 H B	pH @21.0°C	7.44	pH Units				W152091	DKS	12/20/11 09:37	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0013		W152228	CFE	12/23/11 12:32	
SM 4500-P-E	Phosphorus	0.073	mg/L	0.010	0.004		W153169	SM	12/30/11 14:33	H3,Q5



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

(208) 784-1258

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Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0358**

Reported: 05-Jan-12 11:40

Client Sample ID: **M2-PZ1-TW**

SVL Sample ID: **W1L0358-03 (Ground Water)**

Sample Report Page 3 of 3

Sampled: 12-Dec-11 17:20

Received: 19-Dec-11

Sampled By: GM

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	5.14	mg/L	0.20	0.07		W152159	DT	12/21/11 17:33	
EPA 300.0	Fluoride	< 0.10	mg/L	0.10	0.02		W152159	DT	12/21/11 17:33	
EPA 300.0	Sulfate as SO4	1.55	mg/L	0.30	0.04		W152159	DT	12/21/11 17:33	

Cation/Anion Balance and TDS Ratios

Cation Sum: 4.52 meq/L Anion Sum: 4.72 meq/L C/A Balance: -2.10 % Calculated TDS: 286 TDS/cTDS: 0.70 TDS/eC: 0.48

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Kirby Gray
Technical Director



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: W1L0358

Reported: 05-Jan-12 11:40

Client Sample ID: MA-PZ6-TW

SVL Sample ID: W1L0358-04 (Ground Water)

Sample Report Page 1 of 3

Sampled: 11-Dec-11 14:20

Received: 19-Dec-11

Sampled By: GM

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W153118	DJA	01/03/12 09:34	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	0.338	mg/L	0.080	0.008		W152131	TJK	01/03/12 12:38	
EPA 200.7	Barium	0.0205	mg/L	0.0020	0.0002		W152131	TJK	01/03/12 12:40	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0002		W152131	TJK	01/03/12 12:38	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W152131	TJK	01/03/12 12:38	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0002		W152131	TJK	01/03/12 12:40	
EPA 200.7	Calcium	34.5	mg/L	0.040	0.006		W152131	TJK	01/03/12 12:38	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0003		W152131	TJK	01/03/12 12:40	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W152131	TJK	01/03/12 12:40	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.002		W152131	TJK	01/03/12 12:40	
EPA 200.7	Iron	0.318	mg/L	0.060	0.008		W152131	TJK	01/03/12 12:38	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0017		W152131	TJK	01/03/12 12:40	
EPA 200.7	Magnesium	14.6	mg/L	0.060	0.010		W152131	TJK	01/03/12 12:38	
EPA 200.7	Manganese	0.410	mg/L	0.0040	0.0006		W152131	TJK	01/03/12 12:38	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.0006		W152131	TJK	01/03/12 12:40	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W152131	TJK	01/03/12 12:40	
EPA 200.7	Potassium	2.20	mg/L	0.50	0.03		W152131	TJK	01/03/12 12:38	
EPA 200.7	Silicon	22.5	mg/L	0.08	0.01		W152131	TJK	01/03/12 12:38	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0003		W152131	TJK	01/03/12 12:40	
EPA 200.7	Sodium	36.0	mg/L	0.50	0.02		W152131	TJK	01/03/12 12:38	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0002		W152131	TJK	01/03/12 12:40	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0002		W152131	TJK	01/03/12 12:40	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0010		W152131	TJK	01/03/12 12:40	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00009	2.5	W152144	KWH	12/27/11 12:34	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0006	2.5	W152144	KWH	12/27/11 12:34	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00070	2.5	W152144	KWH	12/27/11 12:34	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000015	2.5	W152144	KWH	12/27/11 12:34	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000011	2.5	W152144	KWH	12/27/11 12:34	
SM 2340B	Hardness (as CaCO3)	143	mg/L	0.347	0.116		N/A		01/01/12 12:28	



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0358**

Reported: 05-Jan-12 11:40

Client Sample ID: **MA-PZ6-TW**

SVL Sample ID: **W1L0358-04 (Ground Water)**

Sample Report Page 2 of 3

Sampled: 11-Dec-11 14:20

Received: 19-Dec-11

Sampled By: GM

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Dissolved)

EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.016		W152073	AS	01/01/12 12:28	
EPA 200.7	Barium	0.0188	mg/L	0.0020	0.0004		W152073	AS	01/01/12 12:29	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0004		W152073	AS	01/01/12 12:28	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W152073	AS	01/01/12 12:28	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W152073	AS	01/01/12 12:29	
EPA 200.7	Calcium	33.7	mg/L	0.040	0.012		W152073	AS	01/01/12 12:28	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W152073	AS	01/01/12 12:29	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W152073	AS	01/01/12 12:29	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.003		W152073	AS	01/01/12 12:29	
EPA 200.7	Iron	0.082	mg/L	0.060	0.017		W152073	AS	01/01/12 12:28	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0034		W152073	AS	01/01/12 12:29	
EPA 200.7	Magnesium	14.4	mg/L	0.060	0.021		W152073	AS	01/01/12 12:28	
EPA 200.7	Manganese	0.399	mg/L	0.0040	0.0011		W152073	AS	01/01/12 12:28	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W152073	AS	01/01/12 12:29	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W152073	AS	01/01/12 12:29	
EPA 200.7	Potassium	2.31	mg/L	0.50	0.07		W152073	TJK	12/30/11 13:23	
EPA 200.7	Silicon	20.9	mg/L	0.08	0.03		W152073	AS	01/01/12 12:28	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0005		W152073	AS	01/01/12 12:29	
EPA 200.7	Sodium	38.3	mg/L	0.50	0.04		W152073	AS	01/01/12 12:28	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W152073	AS	01/01/12 12:29	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W152073	AS	01/01/12 12:29	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0021		W152073	AS	01/01/12 12:29	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00007		W152078	KWH	12/28/11 08:31	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0005		W152078	KWH	12/28/11 08:31	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00056		W152078	KWH	12/28/11 08:31	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000012		W152078	KWH	12/28/11 08:31	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0009		W152126	CFE	12/21/11 12:27	
EPA 120.1	Specific conductance	421	µmhos/cm	5.00			W152085	JMS	12/20/11 12:31	
EPA 180.1	Turbidity	11.3	NTU	0.100			W152068	SM	12/20/11 10:20	H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0024		W152129	CFE	12/21/11 14:58	
EPA 350.1	Ammonia as N	0.244	mg/L	0.030	0.009		W153120	RHW	01/03/12 15:59	Q5
EPA 353.2	Nitrate/Nitrite as N	< 0.050	mg/L	0.050	0.015		W201034	RHW	01/04/12 14:49	
SM 2320B/2310B	Bicarbonate	218	mg/L	1.0	0.5		W152091	DKS	12/20/11 09:44	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.5		W152091	DKS	12/20/11 09:44	
SM 2320B/2310B	Total Alkalinity	218	mg/L	1.0	0.5		W152091	DKS	12/20/11 09:44	
SM 2540 C	Total Diss. Solids	212	mg/L	20			W152087	JMS	12/20/11 14:00	H3
SM 2540 D	Total Susp. Solids	24.0	mg/L	10.0			W152086	JMS	12/20/11 14:00	H3
SM 4500 H B	pH @21.0°C	7.64	pH Units				W152091	DKS	12/20/11 09:44	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0013		W152228	CFE	12/23/11 12:34	
SM 4500-P-E	Phosphorus	0.065	mg/L	0.010	0.004		W153169	SM	12/30/11 14:33	H3,Q5



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

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Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0358**

Reported: 05-Jan-12 11:40

Client Sample ID: **MA-PZ6-TW**

SVL Sample ID: **W1L0358-04 (Ground Water)**

Sample Report Page 3 of 3

Sampled: 11-Dec-11 14:20

Received: 19-Dec-11

Sampled By: GM

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	7.16	mg/L	0.20	0.07		W152159	DT	12/21/11 17:49	
EPA 300.0	Fluoride	< 0.10	mg/L	0.10	0.02		W152159	DT	12/21/11 17:49	
EPA 300.0	Sulfate as SO4	9.66	mg/L	0.30	0.04		W152159	DT	12/21/11 17:49	

Cation/Anion Balance and TDS Ratios

Cation Sum: 4.53 meq/L Anion Sum: 4.76 meq/L C/A Balance: -2.53 % Calculated TDS: 294 TDS/cTDS: 0.72 TDS/eC: 0.50

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Kirby Gray
Technical Director



Golder Associates (WA)
 18300 NE Union Hill Road, Suite 200
 Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0358**

Reported: 05-Jan-12 11:40

Client Sample ID: **TSF-MW-1**

SVL Sample ID: **W1L0358-05 (Ground Water)**

Sample Report Page 1 of 3

Sampled: 13-Dec-11 15:35

Received: 19-Dec-11

Sampled By: GM

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W153118	DJA	01/03/12 09:36	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	0.252	mg/L	0.080	0.008		W152131	TJK	01/03/12 12:44	
EPA 200.7	Barium	0.0185	mg/L	0.0020	0.0002		W152131	TJK	01/03/12 12:46	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0002		W152131	TJK	01/03/12 12:44	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W152131	TJK	01/03/12 12:44	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0002		W152131	TJK	01/03/12 12:46	
EPA 200.7	Calcium	8.60	mg/L	0.040	0.006		W152131	TJK	01/03/12 12:44	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0003		W152131	TJK	01/03/12 12:46	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W152131	TJK	01/03/12 12:46	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.002		W152131	TJK	01/03/12 12:46	
EPA 200.7	Iron	2.40	mg/L	0.060	0.008		W152131	TJK	01/03/12 12:44	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0017		W152131	TJK	01/03/12 12:46	
EPA 200.7	Magnesium	5.16	mg/L	0.060	0.010		W152131	TJK	01/03/12 12:44	
EPA 200.7	Manganese	0.513	mg/L	0.0040	0.0006		W152131	TJK	01/03/12 12:44	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.0006		W152131	TJK	01/03/12 12:46	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W152131	TJK	01/03/12 12:46	
EPA 200.7	Potassium	0.66	mg/L	0.50	0.03		W152131	TJK	01/03/12 12:44	
EPA 200.7	Silicon	13.7	mg/L	0.08	0.01		W152131	TJK	01/03/12 12:44	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0003		W152131	TJK	01/03/12 12:46	
EPA 200.7	Sodium	20.8	mg/L	0.50	0.02		W152131	TJK	01/03/12 12:44	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0002		W152131	TJK	01/03/12 12:46	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0002		W152131	TJK	01/03/12 12:46	
EPA 200.7	Zinc	0.0287	mg/L	0.0100	0.0010		W152131	TJK	01/03/12 12:46	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00009	2.5	W152144	KWH	12/27/11 12:36	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0006	2.5	W152144	KWH	12/27/11 12:36	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00070	2.5	W152144	KWH	12/27/11 12:36	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000015	2.5	W152144	KWH	12/27/11 12:36	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000011	2.5	W152144	KWH	12/27/11 12:36	
SM 2340B	Hardness (as CaCO3)	39.7	mg/L	0.347	0.116		N/A		01/01/12 12:34	



Golder Associates (WA)
 18300 NE Union Hill Road, Suite 200
 Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0358**

Reported: 05-Jan-12 11:40

Client Sample ID: **TSF-MW-1**

SVL Sample ID: **W1L0358-05 (Ground Water)**

Sample Report Page 2 of 3

Sampled: 13-Dec-11 15:35

Received: 19-Dec-11

Sampled By: GM

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.016		W152073	AS	01/01/12 12:34	
EPA 200.7	Barium	0.0171	mg/L	0.0020	0.0004		W152073	AS	01/01/12 12:35	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0004		W152073	AS	01/01/12 12:34	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W152073	AS	01/01/12 12:34	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W152073	AS	01/01/12 12:35	
EPA 200.7	Calcium	7.67	mg/L	0.040	0.012		W152073	AS	01/01/12 12:34	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W152073	AS	01/01/12 12:35	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W152073	AS	01/01/12 12:35	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.003		W152073	AS	01/01/12 12:35	
EPA 200.7	Iron	2.19	mg/L	0.060	0.017		W152073	AS	01/01/12 12:34	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0034		W152073	AS	01/01/12 12:35	
EPA 200.7	Magnesium	4.98	mg/L	0.060	0.021		W152073	AS	01/01/12 12:34	
EPA 200.7	Manganese	0.499	mg/L	0.0040	0.0011		W152073	AS	01/01/12 12:34	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W152073	AS	01/01/12 12:35	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W152073	AS	01/01/12 12:35	
EPA 200.7	Potassium	0.82	mg/L	0.50	0.07		W152073	TJK	12/30/11 13:29	
EPA 200.7	Silicon	12.2	mg/L	0.08	0.03		W152073	AS	01/01/12 12:34	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0005		W152073	AS	01/01/12 12:35	
EPA 200.7	Sodium	21.9	mg/L	0.50	0.04		W152073	AS	01/01/12 12:34	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W152073	AS	01/01/12 12:35	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W152073	AS	01/01/12 12:35	
EPA 200.7	Zinc	0.0259	mg/L	0.0100	0.0021		W152073	AS	01/01/12 12:35	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00007		W152078	KWH	12/28/11 08:37	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0005		W152078	KWH	12/28/11 08:37	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00056		W152078	KWH	12/28/11 08:37	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000012		W152078	KWH	12/28/11 08:37	
Classical Chemistry Parameters										
ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0009		W152126	CFE	12/21/11 12:29	
EPA 120.1	Specific conductance	179	µmhos/cm	5.00			W152085	JMS	12/20/11 12:31	
EPA 180.1	Turbidity	9.23	NTU	0.100			W152068	SM	12/20/11 10:20	H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0024		W152129	CFE	12/21/11 15:00	
EPA 350.1	Ammonia as N	0.080	mg/L	0.030	0.009		W153120	RHW	01/03/12 16:01	
EPA 353.2	Nitrate/Nitrite as N	0.107	mg/L	0.050	0.015		W201034	RHW	01/04/12 14:50	
SM 2320B/2310B	Bicarbonate	74.9	mg/L	1.0	0.5		W152091	DKS	12/20/11 09:51	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.5		W152091	DKS	12/20/11 09:51	
SM 2320B/2310B	Total Alkalinity	74.9	mg/L	1.0	0.5		W152091	DKS	12/20/11 09:51	
SM 2540 C	Total Diss. Solids	114	mg/L	20			W152087	JMS	12/20/11 14:00	
SM 2540 D	Total Susp. Solids	< 10.0	mg/L	10.0			W152086	JMS	12/20/11 14:00	
SM 4500 H B	pH @21.0°C	6.70	pH Units				W152091	DKS	12/20/11 09:51	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0013		W153021	CFE	12/27/11 13:01	
SM 4500-P-E	Phosphorus	0.049	mg/L	0.010	0.004		W153169	SM	12/30/11 14:33	



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

(208) 784-1258

Fax (208) 783-0891

Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0358**

Reported: 05-Jan-12 11:40

Client Sample ID: **TSF-MW-1**

SVL Sample ID: **W1L0358-05 (Ground Water)**

Sample Report Page 3 of 3

Sampled: 13-Dec-11 15:35

Received: 19-Dec-11

Sampled By: GM

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	7.50	mg/L	0.20	0.07		W152159	DT	12/21/11 18:23	
EPA 300.0	Fluoride	< 0.10	mg/L	0.10	0.02		W152159	DT	12/21/11 18:23	
EPA 300.0	Sulfate as SO4	7.14	mg/L	0.30	0.04		W152159	DT	12/21/11 18:23	

Cation/Anion Balance and TDS Ratios

Cation Sum: 1.82 meq/L Anion Sum: 1.87 meq/L C/A Balance: -1.25 % Calculated TDS: 130 TDS/cTDS: 0.87 TDS/eC: 0.64

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Kirby Gray
Technical Director



Golder Associates (WA)
 18300 NE Union Hill Road, Suite 200
 Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0358**

Reported: 05-Jan-12 11:40

Client Sample ID: **TSF-TW-3**

SVL Sample ID: **W1L0358-06 (Ground Water)**

Sample Report Page 1 of 3

Sampled: 13-Dec-11 12:40

Received: 19-Dec-11

Sampled By: GM

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W153118	DJA	01/03/12 09:37	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	8.25	mg/L	0.080	0.008		W152131	TJK	01/03/12 13:10	
EPA 200.7	Barium	0.0292	mg/L	0.0020	0.0002		W152131	TJK	01/03/12 13:11	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0002		W152131	TJK	01/03/12 13:10	
EPA 200.7	Boron	0.050	mg/L	0.040	0.005		W152131	TJK	01/03/12 13:10	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0002		W152131	TJK	01/03/12 13:11	
EPA 200.7	Calcium	6.84	mg/L	0.040	0.006		W152131	TJK	01/03/12 13:10	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0003		W152131	TJK	01/03/12 13:11	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W152131	TJK	01/03/12 13:11	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.002		W152131	TJK	01/03/12 13:11	
EPA 200.7	Iron	2.92	mg/L	0.060	0.008		W152131	TJK	01/03/12 13:10	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0017		W152131	TJK	01/03/12 13:11	
EPA 200.7	Magnesium	1.85	mg/L	0.060	0.010		W152131	TJK	01/03/12 13:10	
EPA 200.7	Manganese	0.0600	mg/L	0.0040	0.0006		W152131	TJK	01/03/12 13:10	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.0006		W152131	TJK	01/03/12 13:11	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W152131	TJK	01/03/12 13:11	
EPA 200.7	Potassium	4.89	mg/L	0.50	0.03		W152131	TJK	01/03/12 13:10	
EPA 200.7	Silicon	25.4	mg/L	0.08	0.01		W152131	TJK	01/03/12 13:10	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0003		W152131	TJK	01/03/12 13:11	
EPA 200.7	Sodium	69.4	mg/L	0.50	0.02		W152131	TJK	01/03/12 13:10	
EPA 200.7	Titanium	0.0133	mg/L	0.0050	0.0002		W152131	TJK	01/03/12 13:11	
EPA 200.7	Vanadium	0.0068	mg/L	0.0050	0.0002		W152131	TJK	01/03/12 13:11	
EPA 200.7	Zinc	0.0144	mg/L	0.0100	0.0010		W152131	TJK	01/03/12 13:11	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00009	2.5	W152144	KWH	12/27/11 12:38	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0006	2.5	W152144	KWH	12/27/11 12:38	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00070	2.5	W152144	KWH	12/27/11 12:38	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000015	2.5	W152144	KWH	12/27/11 12:38	
EPA 200.8	Uranium	0.00259	mg/L	0.00100	0.000011	2.5	W152144	KWH	12/27/11 12:38	
SM 2340B	Hardness (as CaCO3)	8.25	mg/L	0.347	0.116		N/A		01/01/12 12:46	



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0358**

Reported: 05-Jan-12 11:40

Client Sample ID: **TSF-TW-3**

SVL Sample ID: **W1L0358-06 (Ground Water)**

Sample Report Page 2 of 3

Sampled: 13-Dec-11 12:40

Received: 19-Dec-11

Sampled By: GM

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.016		W152073	AS	01/01/12 12:46	
EPA 200.7	Barium	0.0094	mg/L	0.0020	0.0004		W152073	AS	01/01/12 12:47	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0004		W152073	AS	01/01/12 12:46	
EPA 200.7	Boron	0.050	mg/L	0.040	0.010		W152073	AS	01/01/12 12:46	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W152073	AS	01/01/12 12:47	
EPA 200.7	Calcium	2.94	mg/L	0.040	0.012		W152073	AS	01/01/12 12:45	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W152073	AS	01/01/12 12:47	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W152073	AS	01/01/12 12:47	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.003		W152073	AS	01/01/12 12:47	
EPA 200.7	Iron	0.073	mg/L	0.060	0.017		W152073	AS	01/01/12 12:46	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0034		W152073	AS	01/01/12 12:47	
EPA 200.7	Magnesium	0.219	mg/L	0.060	0.021		W152073	AS	01/01/12 12:46	
EPA 200.7	Manganese	0.0251	mg/L	0.0040	0.0011		W152073	AS	01/01/12 12:46	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W152073	AS	01/01/12 12:47	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W152073	AS	01/01/12 12:47	
EPA 200.7	Potassium	4.63	mg/L	0.50	0.07		W152073	TJK	12/30/11 13:41	
EPA 200.7	Silicon	5.85	mg/L	0.08	0.03		W152073	AS	01/01/12 12:46	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0005		W152073	AS	01/01/12 12:47	
EPA 200.7	Sodium	69.1	mg/L	0.50	0.04		W152073	AS	01/01/12 12:45	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W152073	AS	01/01/12 12:47	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W152073	AS	01/01/12 12:47	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0021		W152073	AS	01/01/12 12:47	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00007		W152078	KWH	12/28/11 08:43	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0005		W152078	KWH	12/28/11 08:43	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00056		W152078	KWH	12/28/11 08:43	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000012		W152078	KWH	12/28/11 08:43	
Classical Chemistry Parameters										
ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0009		W152126	CFF	12/21/11 12:31	
EPA 120.1	Specific conductance	341	µmhos/cm	5.00			W152085	JMS	12/20/11 12:31	
EPA 180.1	Turbidity	96.5	NTU	0.500		5	W152068	SM	12/20/11 10:20	D2,H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0024		W152129	CFF	12/21/11 15:02	
EPA 350.1	Ammonia as N	0.490	mg/L	0.030	0.009		W153120	RHW	01/03/12 16:02	
EPA 353.2	Nitrate/Nitrite as N	0.673	mg/L	0.050	0.015		W201034	RHW	01/04/12 14:52	
SM 2320B/2310B	Bicarbonate	140	mg/L	1.0	0.5		W152091	DKS	12/20/11 10:01	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.5		W152091	DKS	12/20/11 10:01	
SM 2320B/2310B	Total Alkalinity	140	mg/L	1.0	0.5		W152091	DKS	12/20/11 10:01	
SM 2540 C	Total Diss. Solids	254	mg/L	20			W152087	JMS	12/20/11 14:00	
SM 2540 D	Total Susp. Solids	194	mg/L	10.0			W152086	JMS	12/20/11 14:00	
SM 4500 H B	pH @23.0°C	7.09	pH Units				W152091	DKS	12/20/11 10:01	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0013		W153021	CFF	12/27/11 13:03	
SM 4500-P-E	Phosphorus	0.124	mg/L	0.010	0.004		W153169	SM	12/30/11 14:33	



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

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Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0358**

Reported: 05-Jan-12 11:40

Client Sample ID: **TSF-TW-3**

SVL Sample ID: **W1L0358-06 (Ground Water)**

Sample Report Page 3 of 3

Sampled: 13-Dec-11 12:40

Received: 19-Dec-11

Sampled By: GM

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	4.46	mg/L	0.20	0.07		W152159	DT	12/21/11 18:31	
EPA 300.0	Fluoride	0.53	mg/L	0.10	0.02		W152159	DT	12/21/11 18:31	
EPA 300.0	Sulfate as SO4	31.2	mg/L	0.30	0.04		W152159	DT	12/21/11 18:31	

Cation/Anion Balance and TDS Ratios

Cation Sum: 3.33 meq/L Anion Sum: 3.65 meq/L C/A Balance: -4.59 % Calculated TDS: 245 TDS/cTDS: 1.03 TDS/eC: 0.74

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Kirby Gray
Technical Director



Golder Associates (WA)
 18300 NE Union Hill Road, Suite 200
 Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0358**

Reported: 05-Jan-12 11:40

Client Sample ID: **MA-PZ1-TW1-R**

SVL Sample ID: **W1L0358-07 (Ground Water)**

Sample Report Page 1 of 3

Sampled: 12-Dec-11 12:50

Received: 19-Dec-11

Sampled By: GM

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total)										
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W153118	DJA	01/03/12 09:39	
Metals (Total Recoverable--reportable as Total per 40 CFR 136)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.008		W152131	TJK	01/03/12 13:16	
EPA 200.7	Barium	0.0276	mg/L	0.0020	0.0002		W152131	TJK	01/03/12 13:17	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0002		W152131	TJK	01/03/12 13:16	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W152131	TJK	01/03/12 13:16	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0002		W152131	TJK	01/03/12 13:17	
EPA 200.7	Calcium	32.0	mg/L	0.040	0.006		W152131	TJK	01/03/12 13:15	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0003		W152131	TJK	01/03/12 13:17	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W152131	TJK	01/03/12 13:17	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.002		W152131	TJK	01/03/12 13:17	
EPA 200.7	Iron	0.936	mg/L	0.060	0.008		W152131	TJK	01/03/12 13:16	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0017		W152131	TJK	01/03/12 13:17	
EPA 200.7	Magnesium	17.4	mg/L	0.060	0.010		W152131	TJK	01/03/12 13:15	
EPA 200.7	Manganese	0.674	mg/L	0.0040	0.0006		W152131	TJK	01/03/12 13:15	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.0006		W152131	TJK	01/03/12 13:17	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W152131	TJK	01/03/12 13:17	
EPA 200.7	Potassium	0.79	mg/L	0.50	0.03		W152131	TJK	01/03/12 13:15	
EPA 200.7	Silicon	32.5	mg/L	0.08	0.01		W152131	TJK	01/03/12 13:15	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0003		W152131	TJK	01/03/12 13:17	
EPA 200.7	Sodium	21.4	mg/L	0.50	0.02		W152131	TJK	01/03/12 13:15	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0002		W152131	TJK	01/03/12 13:17	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0002		W152131	TJK	01/03/12 13:17	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0010		W152131	TJK	01/03/12 13:17	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00009	2.5	W152144	KWH	12/27/11 12:39	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0006	2.5	W152144	KWH	12/27/11 12:39	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00070	2.5	W152144	KWH	12/27/11 12:39	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000015	2.5	W152144	KWH	12/27/11 12:39	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000011	2.5	W152144	KWH	12/27/11 12:39	
SM 2340B	Hardness (as CaCO3)	147	mg/L	0.347	0.116		N/A		01/01/12 12:52	



Golder Associates (WA)
 18300 NE Union Hill Road, Suite 200
 Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0358**

Reported: 05-Jan-12 11:40

Client Sample ID: **MA-PZ1-TW1-R**

Sampled: 12-Dec-11 12:50

SVL Sample ID: **W1L0358-07 (Ground Water)**

Received: 19-Dec-11

Sample Report Page 2 of 3

Sampled By: GM

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.016		W152073	AS	01/01/12 12:52	
EPA 200.7	Barium	0.0277	mg/L	0.0020	0.0004		W152073	AS	01/01/12 12:53	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0004		W152073	AS	01/01/12 12:52	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W152073	AS	01/01/12 12:52	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W152073	AS	01/01/12 12:53	
EPA 200.7	Calcium	30.6	mg/L	0.040	0.012		W152073	AS	01/01/12 12:51	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W152073	AS	01/01/12 12:53	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W152073	AS	01/01/12 12:53	
EPA 200.7	Copper	< 0.010	mg/L	0.010	0.003		W152073	AS	01/01/12 12:53	
EPA 200.7	Iron	0.884	mg/L	0.060	0.017		W152073	AS	01/01/12 12:52	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0034		W152073	AS	01/01/12 12:53	
EPA 200.7	Magnesium	17.0	mg/L	0.060	0.021		W152073	AS	01/01/12 12:52	
EPA 200.7	Manganese	0.648	mg/L	0.0040	0.0011		W152073	AS	01/01/12 12:52	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W152073	AS	01/01/12 12:53	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W152073	AS	01/01/12 12:53	
EPA 200.7	Potassium	0.93	mg/L	0.50	0.07		W152073	TJK	12/30/11 13:47	
EPA 200.7	Silicon	30.7	mg/L	0.08	0.03		W152073	AS	01/01/12 12:51	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0005		W152073	AS	01/01/12 12:53	
EPA 200.7	Sodium	22.6	mg/L	0.50	0.04		W152073	AS	01/01/12 12:51	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W152073	AS	01/01/12 12:53	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W152073	AS	01/01/12 12:53	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0021		W152073	AS	01/01/12 12:53	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00007		W152078	KWH	12/28/11 09:00	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0005		W152078	KWH	12/28/11 09:00	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00056		W152078	KWH	12/28/11 09:00	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000012		W152078	KWH	12/28/11 09:00	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0009		W152126	CFF	12/21/11 12:33	
EPA 120.1	Specific conductance	363	µmhos/cm	5.00			W152085	JMS	12/20/11 12:31	
EPA 180.1	Turbidity	6.01	NTU	0.100			W152068	SM	12/20/11 10:20	H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0024		W152129	CFF	12/21/11 15:11	
EPA 350.1	Ammonia as N	< 0.030	mg/L	0.030	0.009		W153120	RHW	01/03/12 16:03	
EPA 353.2	Nitrate/Nitrite as N	0.101	mg/L	0.050	0.015		W201034	RHW	01/04/12 14:53	
SM 2320B/2310B	Bicarbonate	195	mg/L	1.0	0.5		W152091	DKS	12/20/11 10:06	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.5		W152091	DKS	12/20/11 10:06	
SM 2320B/2310B	Total Alkalinity	195	mg/L	1.0	0.5		W152091	DKS	12/20/11 10:06	
SM 2540 C	Total Diss. Solids	228	mg/L	20			W152087	JMS	12/20/11 14:00	H3
SM 2540 D	Total Susp. Solids	< 10.0	mg/L	10.0			W152086	JMS	12/20/11 14:00	H3
SM 4500 H B	pH @23.0°C	7.34	pH Units				W152091	DKS	12/20/11 10:06	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0013		W152228	CFF	12/23/11 12:36	
SM 4500-P-E	Phosphorus	0.137	mg/L	0.010	0.004		W153169	SM	12/30/11 14:33	



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

(208) 784-1258

Fax (208) 783-0891

Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0358**

Reported: 05-Jan-12 11:40

Client Sample ID: **MA-PZ1-TW1-R**

SVL Sample ID: **W1L0358-07 (Ground Water)**

Sample Report Page 3 of 3

Sampled: 12-Dec-11 12:50

Received: 19-Dec-11

Sampled By: GM

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	5.63	mg/L	0.20	0.07		W152159	DT	12/21/11 18:48	
EPA 300.0	Fluoride	< 0.10	mg/L	0.10	0.02		W152159	DT	12/21/11 18:48	
EPA 300.0	Sulfate as SO4	0.77	mg/L	0.30	0.04		W152159	DT	12/21/11 18:48	

Cation/Anion Balance and TDS Ratios

Cation Sum: 3.93 meq/L Anion Sum: 4.08 meq/L C/A Balance: -1.81 % Calculated TDS: 281 TDS/cTDS: 0.81 TDS/eC: 0.63

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Kirby Gray
Technical Director



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: W1L0358

Reported: 05-Jan-12 11:40

Client Sample ID: TSF-PZ-8-E

SVL Sample ID: W1L0358-08 (Ground Water)

Sample Report Page 1 of 3

Sampled: 14-Dec-11 10:50

Received: 19-Dec-11

Sampled By: PN

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total)										
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W153118	DJA	01/03/12 09:41	
Metals (Total Recoverable--reportable as Total per 40 CFR 136)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.008		W152131	TJK	01/03/12 13:21	
EPA 200.7	Barium	0.0088	mg/L	0.0020	0.0002		W152131	TJK	01/03/12 13:23	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0002		W152131	TJK	01/03/12 13:21	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W152131	TJK	01/03/12 13:21	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0002		W152131	TJK	01/03/12 13:23	
EPA 200.7	Calcium	0.786	mg/L	0.040	0.006		W152131	TJK	01/03/12 13:21	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0003		W152131	TJK	01/03/12 13:22	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W152131	TJK	01/03/12 13:23	
EPA 200.7	Copper	0.116	mg/L	0.010	0.002		W152131	TJK	01/03/12 13:22	
EPA 200.7	Iron	< 0.060	mg/L	0.060	0.008		W152131	TJK	01/03/12 13:21	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0017		W152131	TJK	01/03/12 13:23	
EPA 200.7	Magnesium	0.094	mg/L	0.060	0.010		W152131	TJK	01/03/12 13:21	
EPA 200.7	Manganese	< 0.0040	mg/L	0.0040	0.0006		W152131	TJK	01/03/12 13:21	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.0006		W152131	TJK	01/03/12 13:23	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W152131	TJK	01/03/12 13:23	
EPA 200.7	Potassium	< 0.50	mg/L	0.50	0.03		W152131	TJK	01/03/12 13:21	
EPA 200.7	Silicon	0.14	mg/L	0.08	0.01		W152131	TJK	01/03/12 13:21	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0003		W152131	TJK	01/03/12 13:22	
EPA 200.7	Sodium	< 0.50	mg/L	0.50	0.02		W152131	TJK	01/03/12 13:21	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0002		W152131	TJK	01/03/12 13:22	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0002		W152131	TJK	01/03/12 13:22	
EPA 200.7	Zinc	0.386	mg/L	0.0100	0.0010		W152131	TJK	01/03/12 13:22	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00009	2.5	W152144	KWH	12/27/11 12:41	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0006	2.5	W152144	KWH	12/27/11 12:41	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00070	2.5	W152144	KWH	12/27/11 12:41	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.00003	5	W152144	KWH	12/27/11 12:58	D5
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000022	5	W152144	KWH	12/27/11 12:58	D5
SM 2340B	Hardness (as CaCO3)	2.19	mg/L	0.347	0.116		N/A		01/01/12 12:58	



Golder Associates (WA)
 18300 NE Union Hill Road, Suite 200
 Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0358**

Reported: 05-Jan-12 11:40

Client Sample ID: **TSF-PZ-8-E**

SVL Sample ID: **W1L0358-08 (Ground Water)**

Sample Report Page 2 of 3

Sampled: 14-Dec-11 10:50

Received: 19-Dec-11

Sampled By: PN

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.016		W152073	AS	01/01/12 12:58	
EPA 200.7	Barium	0.0088	mg/L	0.0020	0.0004		W152073	AS	01/01/12 12:59	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0004		W152073	AS	01/01/12 12:58	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W152073	AS	01/01/12 12:58	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W152073	AS	01/01/12 12:59	
EPA 200.7	Calcium	0.749	mg/L	0.040	0.012		W152073	AS	01/01/12 12:58	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W152073	AS	01/01/12 12:59	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W152073	AS	01/01/12 12:59	
EPA 200.7	Copper	0.124	mg/L	0.010	0.003		W152073	AS	01/01/12 12:59	
EPA 200.7	Iron	< 0.060	mg/L	0.060	0.017		W152073	AS	01/01/12 12:58	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0034		W152073	AS	01/01/12 12:59	
EPA 200.7	Magnesium	0.077	mg/L	0.060	0.021		W152073	AS	01/01/12 12:58	
EPA 200.7	Manganese	< 0.0040	mg/L	0.0040	0.0011		W152073	AS	01/01/12 12:58	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W152073	AS	01/01/12 12:59	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W152073	AS	01/01/12 12:59	
EPA 200.7	Potassium	< 0.50	mg/L	0.50	0.07		W152073	TJK	12/30/11 13:53	
EPA 200.7	Silicon	0.13	mg/L	0.08	0.03		W152073	AS	01/01/12 12:58	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0005		W152073	AS	01/01/12 12:59	
EPA 200.7	Sodium	< 0.50	mg/L	0.50	0.04		W152073	AS	01/01/12 12:57	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W152073	AS	01/01/12 12:59	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W152073	AS	01/01/12 12:59	
EPA 200.7	Zinc	0.356	mg/L	0.0100	0.0021		W152073	AS	01/01/12 12:59	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00007		W152078	KWH	12/28/11 09:06	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0005		W152078	KWH	12/28/11 09:06	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00056		W152078	KWH	12/28/11 09:06	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000012		W152078	KWH	12/28/11 09:06	
Classical Chemistry Parameters										
ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0009		W152126	CFF	12/21/11 12:35	
EPA 120.1	Specific conductance	10.0	µmhos/cm	5.00			W152085	JMS	12/20/11 12:31	
EPA 180.1	Turbidity	0.171	NTU	0.100			W152068	SM	12/20/11 10:20	H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0024		W152129	CFF	12/21/11 15:13	
EPA 350.1	Ammonia as N	< 0.030	mg/L	0.030	0.009		W153120	RHW	01/03/12 16:05	
EPA 353.2	Nitrate/Nitrite as N	0.225	mg/L	0.050	0.015		W201034	RHW	01/04/12 14:54	
SM 2320B/2310B	Bicarbonate	1.4	mg/L	1.0	0.5		W152091	DKS	12/20/11 11:52	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.5		W152091	DKS	12/20/11 11:52	
SM 2320B/2310B	Total Alkalinity	1.4	mg/L	1.0	0.5		W152091	DKS	12/20/11 11:52	
SM 2540 C	Total Diss. Solids	< 20	mg/L	20			W152087	JMS	12/20/11 14:00	
SM 2540 D	Total Susp. Solids	< 10.0	mg/L	10.0			W152086	JMS	12/20/11 14:00	
SM 4500 H B	pH @23.0°C	6.05	pH Units				W152091	DKS	12/20/11 11:52	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0013		W153021	CFF	12/27/11 13:05	
SM 4500-P-E	Phosphorus	< 0.010	mg/L	0.010	0.004		W153169	SM	12/30/11 14:33	



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

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Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0358**

Reported: 05-Jan-12 11:40

Client Sample ID: **TSF-PZ-8-E**

SVL Sample ID: **W1L0358-08 (Ground Water)**

Sample Report Page 3 of 3

Sampled: 14-Dec-11 10:50

Received: 19-Dec-11

Sampled By: PN

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	1.12	mg/L	0.20	0.07		W152159	DT	12/21/11 19:05	
EPA 300.0	Fluoride	< 0.10	mg/L	0.10	0.02		W152159	DT	12/21/11 19:05	
EPA 300.0	Sulfate as SO4	0.51	mg/L	0.30	0.04		W152159	DT	12/21/11 19:05	

Cation/Anion Balance and TDS Ratios

Cation Sum: 0.06 meq/L Anion Sum: 0.09 meq/L C/A Balance: -16.97 % Calculated TDS: 5 TDS/cTDS: 0.00 TDS/eC: 0.00

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Kirby Gray
Technical Director



Golder Associates (WA)
 18300 NE Union Hill Road, Suite 200
 Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0358**

Reported: 05-Jan-12 11:40

Client Sample ID: **TSF-PZ-8-F**

SVL Sample ID: **W1L0358-09 (Ground Water)**

Sample Report Page 1 of 3

Sampled: 14-Dec-11 10:20

Received: 19-Dec-11

Sampled By: PN

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W153118	DJA	01/03/12 09:42	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.008		W152131	TJK	01/03/12 13:27	
EPA 200.7	Barium	0.0089	mg/L	0.0020	0.0002		W152131	TJK	01/03/12 13:28	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0002		W152131	TJK	01/03/12 13:27	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W152131	TJK	01/03/12 13:27	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0002		W152131	TJK	01/03/12 13:28	
EPA 200.7	Calcium	0.796	mg/L	0.040	0.006		W152131	TJK	01/03/12 13:27	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0003		W152131	TJK	01/03/12 13:28	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W152131	TJK	01/03/12 13:28	
EPA 200.7	Copper	0.113	mg/L	0.010	0.002		W152131	TJK	01/03/12 13:28	
EPA 200.7	Iron	< 0.060	mg/L	0.060	0.008		W152131	TJK	01/03/12 13:27	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0017		W152131	TJK	01/03/12 13:28	
EPA 200.7	Magnesium	0.086	mg/L	0.060	0.010		W152131	TJK	01/03/12 13:27	
EPA 200.7	Manganese	< 0.0040	mg/L	0.0040	0.0006		W152131	TJK	01/03/12 13:27	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.0006		W152131	TJK	01/03/12 13:28	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W152131	TJK	01/03/12 13:28	
EPA 200.7	Potassium	< 0.50	mg/L	0.50	0.03		W152131	TJK	01/03/12 13:27	
EPA 200.7	Silicon	0.14	mg/L	0.08	0.01		W152131	TJK	01/03/12 13:27	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0003		W152131	TJK	01/03/12 13:28	
EPA 200.7	Sodium	< 0.50	mg/L	0.50	0.02		W152131	TJK	01/03/12 13:27	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0002		W152131	TJK	01/03/12 13:28	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0002		W152131	TJK	01/03/12 13:28	
EPA 200.7	Zinc	0.347	mg/L	0.0100	0.0010		W152131	TJK	01/03/12 13:28	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00009	2.5	W152144	KWH	12/27/11 12:42	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0006	2.5	W152144	KWH	12/27/11 12:42	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00070	2.5	W152144	KWH	12/27/11 12:42	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000015	2.5	W152144	KWH	12/27/11 12:42	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000011	2.5	W152144	KWH	12/27/11 12:42	
SM 2340B	Hardness (as CaCO3)	2.24	mg/L	0.347	0.116		N/A		01/01/12 13:04	



Golder Associates (WA)
 18300 NE Union Hill Road, Suite 200
 Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0358**

Reported: 05-Jan-12 11:40

Client Sample ID: **TSF-PZ-8-F**

SVL Sample ID: **W1L0358-09 (Ground Water)**

Sample Report Page 2 of 3

Sampled: 14-Dec-11 10:20

Received: 19-Dec-11

Sampled By: PN

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.016		W152073	AS	01/01/12 13:04	
EPA 200.7	Barium	0.0089	mg/L	0.0020	0.0004		W152073	AS	01/01/12 13:05	
EPA 200.7	Beryllium	< 0.0020	mg/L	0.0020	0.0004		W152073	AS	01/01/12 13:04	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W152073	AS	01/01/12 13:04	
EPA 200.7	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W152073	AS	01/01/12 13:05	
EPA 200.7	Calcium	0.772	mg/L	0.040	0.012		W152073	AS	01/01/12 13:04	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W152073	AS	01/01/12 13:05	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W152073	AS	01/01/12 13:05	
EPA 200.7	Copper	0.121	mg/L	0.010	0.003		W152073	AS	01/01/12 13:05	
EPA 200.7	Iron	< 0.060	mg/L	0.060	0.017		W152073	AS	01/01/12 13:04	
EPA 200.7	Lead	< 0.0075	mg/L	0.0075	0.0034		W152073	AS	01/01/12 13:05	
EPA 200.7	Magnesium	0.077	mg/L	0.060	0.021		W152073	AS	01/01/12 13:04	
EPA 200.7	Manganese	< 0.0040	mg/L	0.0040	0.0011		W152073	AS	01/01/12 13:04	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W152073	AS	01/01/12 13:05	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W152073	AS	01/01/12 13:05	
EPA 200.7	Potassium	< 0.50	mg/L	0.50	0.07		W152073	TJK	12/30/11 13:59	
EPA 200.7	Silicon	0.14	mg/L	0.08	0.03		W152073	AS	01/01/12 13:04	
EPA 200.7	Silver	< 0.0050	mg/L	0.0050	0.0005		W152073	AS	01/01/12 13:05	
EPA 200.7	Sodium	< 0.50	mg/L	0.50	0.04		W152073	AS	01/01/12 13:03	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W152073	AS	01/01/12 13:05	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W152073	AS	01/01/12 13:05	
EPA 200.7	Zinc	0.358	mg/L	0.0100	0.0021		W152073	AS	01/01/12 13:05	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00007		W152078	KWH	12/28/11 09:12	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0005		W152078	KWH	12/28/11 09:12	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00056		W152078	KWH	12/28/11 09:12	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000012		W152078	KWH	12/28/11 09:12	
Classical Chemistry Parameters										
ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0009		W152126	CFF	12/21/11 12:37	
EPA 120.1	Specific conductance	9.00	µmhos/cm	5.00			W152085	JMS	12/20/11 12:31	
EPA 180.1	Turbidity	0.192	NTU	0.100			W152068	SM	12/20/11 10:20	H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0024		W152129	CFF	12/21/11 15:15	
EPA 350.1	Ammonia as N	< 0.030	mg/L	0.030	0.009		W153120	RHW	01/03/12 16:06	
EPA 353.2	Nitrate/Nitrite as N	0.218	mg/L	0.050	0.015		W201034	RHW	01/04/12 15:39	
SM 2320B/2310B	Bicarbonate	1.1	mg/L	1.0	0.5		W152091	DKS	12/20/11 11:56	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.5		W152091	DKS	12/20/11 11:56	
SM 2320B/2310B	Total Alkalinity	1.1	mg/L	1.0	0.5		W152091	DKS	12/20/11 11:56	
SM 2540 C	Total Diss. Solids	< 20	mg/L	20			W152087	JMS	12/20/11 14:00	
SM 2540 D	Total Susp. Solids	< 10.0	mg/L	10.0			W152086	JMS	12/20/11 14:00	
SM 4500 H B	pH @22.0°C	5.99	pH Units				W152091	DKS	12/20/11 11:56	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0013		W153021	CFF	12/27/11 13:13	
SM 4500-P-E	Phosphorus	< 0.010	mg/L	0.010	0.004		W153169	SM	12/30/11 14:33	



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

(208) 784-1258

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Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0358**

Reported: 05-Jan-12 11:40

Client Sample ID: **TSF-PZ-8-F**

SVL Sample ID: **W1L0358-09 (Ground Water)**

Sample Report Page 3 of 3

Sampled: 14-Dec-11 10:20

Received: 19-Dec-11

Sampled By: PN

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	1.12	mg/L	0.20	0.07		W152159	DT	12/21/11 19:14	
EPA 300.0	Fluoride	< 0.10	mg/L	0.10	0.02		W152159	DT	12/21/11 19:14	
EPA 300.0	Sulfate as SO4	0.50	mg/L	0.30	0.04		W152159	DT	12/21/11 19:14	

Cation/Anion Balance and TDS Ratios

Cation Sum: 0.06 meq/L Anion Sum: 0.08 meq/L C/A Balance: -12.47 % Calculated TDS: 4 TDS/cTDS: 0.00 TDS/eC: 0.00

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Kirby Gray
Technical Director



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245
Work Order: W1L0358
Reported: 05-Jan-12 11:40

Quality Control - BLANK Data

Method	Analyte	Units	Result	MDL	MRL	Batch ID	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	mg/L	<0.00020	0.000072	0.00020	W153118	03-Jan-12	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	mg/L	<0.080	0.008	0.080	W152131	03-Jan-12	
EPA 200.7	Barium	mg/L	<0.0020	0.0002	0.0020	W152131	03-Jan-12	
EPA 200.7	Beryllium	mg/L	<0.0020	0.0002	0.0020	W152131	03-Jan-12	
EPA 200.7	Boron	mg/L	<0.040	0.005	0.040	W152131	03-Jan-12	
EPA 200.7	Cadmium	mg/L	<0.0020	0.0002	0.0020	W152131	03-Jan-12	
EPA 200.7	Calcium	mg/L	<0.040	0.006	0.040	W152131	03-Jan-12	
EPA 200.7	Chromium	mg/L	<0.0060	0.0003	0.0060	W152131	03-Jan-12	
EPA 200.7	Cobalt	mg/L	<0.0060	0.0005	0.0060	W152131	03-Jan-12	
EPA 200.7	Copper	mg/L	<0.010	0.002	0.010	W152131	03-Jan-12	
EPA 200.7	Iron	mg/L	<0.060	0.008	0.060	W152131	03-Jan-12	
EPA 200.7	Lead	mg/L	<0.0075	0.0017	0.0075	W152131	03-Jan-12	
EPA 200.7	Magnesium	mg/L	<0.060	0.010	0.060	W152131	03-Jan-12	
EPA 200.7	Manganese	mg/L	<0.0040	0.0006	0.0040	W152131	03-Jan-12	
EPA 200.7	Molybdenum	mg/L	<0.008	0.0006	0.008	W152131	03-Jan-12	
EPA 200.7	Nickel	mg/L	<0.010	0.002	0.010	W152131	03-Jan-12	
EPA 200.7	Potassium	mg/L	<0.50	0.03	0.50	W152131	03-Jan-12	
EPA 200.7	Silicon	mg/L	<0.08	0.01	0.08	W152131	03-Jan-12	
EPA 200.7	Silver	mg/L	<0.0050	0.0003	0.0050	W152131	03-Jan-12	
EPA 200.7	Sodium	mg/L	<0.50	0.02	0.50	W152131	03-Jan-12	
EPA 200.7	Titanium	mg/L	<0.0050	0.0002	0.0050	W152131	03-Jan-12	
EPA 200.7	Vanadium	mg/L	<0.0050	0.0002	0.0050	W152131	03-Jan-12	
EPA 200.7	Zinc	mg/L	<0.0100	0.0010	0.0100	W152131	03-Jan-12	
EPA 200.8	Antimony	mg/L	<0.00300	0.00009	0.00300	W152144	27-Dec-11	
EPA 200.8	Arsenic	mg/L	<0.0030	0.0006	0.0030	W152144	27-Dec-11	
EPA 200.8	Selenium	mg/L	<0.00300	0.00070	0.00300	W152144	27-Dec-11	
EPA 200.8	Uranium	mg/L	<0.00100	0.000011	0.00100	W152144	27-Dec-11	
EPA 200.8	Thallium	mg/L	<0.00100	0.000015	0.00100	W152144	27-Dec-11	

Metals (Dissolved)

EPA 200.7	Aluminum	mg/L	<0.080	0.016	0.080	W152073	01-Jan-12	
EPA 200.7	Barium	mg/L	<0.0020	0.0004	0.0020	W152073	01-Jan-12	
EPA 200.7	Beryllium	mg/L	<0.0020	0.0004	0.0020	W152073	01-Jan-12	
EPA 200.7	Boron	mg/L	<0.040	0.010	0.040	W152073	01-Jan-12	
EPA 200.7	Cadmium	mg/L	<0.0020	0.0005	0.0020	W152073	01-Jan-12	
EPA 200.7	Calcium	mg/L	<0.040	0.012	0.040	W152073	01-Jan-12	
EPA 200.7	Chromium	mg/L	<0.0060	0.0006	0.0060	W152073	01-Jan-12	
EPA 200.7	Cobalt	mg/L	<0.0060	0.0009	0.0060	W152073	01-Jan-12	
EPA 200.7	Copper	mg/L	<0.010	0.003	0.010	W152073	01-Jan-12	
EPA 200.7	Iron	mg/L	<0.060	0.017	0.060	W152073	01-Jan-12	
EPA 200.7	Lead	mg/L	<0.0075	0.0034	0.0075	W152073	01-Jan-12	
EPA 200.7	Magnesium	mg/L	<0.060	0.021	0.060	W152073	01-Jan-12	
EPA 200.7	Manganese	mg/L	<0.0040	0.0011	0.0040	W152073	01-Jan-12	
EPA 200.7	Molybdenum	mg/L	<0.008	0.001	0.008	W152073	01-Jan-12	
EPA 200.7	Nickel	mg/L	<0.010	0.003	0.010	W152073	01-Jan-12	
EPA 200.7	Potassium	mg/L	<0.50	0.07	0.50	W152073	30-Dec-11	
EPA 200.7	Silicon	mg/L	<0.08	0.03	0.08	W152073	01-Jan-12	
EPA 200.7	Silver	mg/L	<0.0050	0.0005	0.0050	W152073	01-Jan-12	
EPA 200.7	Sodium	mg/L	<0.50	0.04	0.50	W152073	01-Jan-12	
EPA 200.7	Titanium	mg/L	<0.0050	0.0003	0.0050	W152073	01-Jan-12	
EPA 200.7	Vanadium	mg/L	<0.0050	0.0005	0.0050	W152073	01-Jan-12	
EPA 200.7	Zinc	mg/L	<0.0100	0.0021	0.0100	W152073	01-Jan-12	
EPA 200.8	Antimony	mg/L	<0.00300	0.00007	0.00300	W152078	28-Dec-11	
EPA 200.8	Arsenic	mg/L	<0.0030	0.0005	0.0030	W152078	28-Dec-11	
EPA 200.8	Selenium	mg/L	<0.00300	0.00056	0.00300	W152078	28-Dec-11	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245
Work Order: **W1L0358**
Reported: 05-Jan-12 11:40

Quality Control - BLANK Data (Continued)

Method	Analyte	Units	Result	MDL	MRL	Batch ID	Analyzed	Notes
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Metals (Dissolved) (Continued)

EPA 200.8	Thallium	mg/L	<0.00100	0.000012	0.00100	W152078	28-Dec-11	
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Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	mg/L	<0.005	0.0009	0.005	W152125	21-Dec-11	
ASTM D7237	Cyanide (free)	mg/L	<0.005	0.0009	0.005	W152126	21-Dec-11	
ASTM D7237	Cyanide (free)	mg/L	<0.005	0.0009	0.005	W152277	23-Dec-11	
EPA 120.1	Specific conductance	µmhos/cm	<5.00		5.00	W152085	20-Dec-11	
EPA 180.1	Turbidity	NTU	<0.100		0.100	W152068	20-Dec-11	
EPA 335.4	Cyanide (total)	mg/L	<0.0100	0.0024	0.0100	W152129	21-Dec-11	
EPA 350.1	Ammonia as N	mg/L	<0.030	0.009	0.030	W153120	03-Jan-12	
EPA 353.2	Nitrate/Nitrite as N	mg/L	<0.050	0.015	0.050	W201034	04-Jan-12	
SM 2540 C	Total Diss. Solids	mg/L	<10		10	W152087	20-Dec-11	
SM 2540 D	Total Susp. Solids	mg/L	<5.0		5.0	W152086	20-Dec-11	
SM 4500-CN-I	Cyanide (WAD)	mg/L	<0.0100	0.0013	0.0100	W152228	23-Dec-11	
SM 4500-CN-I	Cyanide (WAD)	mg/L	<0.0100	0.0013	0.0100	W153021	27-Dec-11	
SM 4500-P-E	Phosphorus	mg/L	<0.010	0.004	0.010	W153169	30-Dec-11	

Anions by Ion Chromatography

EPA 300.0	Fluoride	mg/L	<0.10	0.02	0.10	W152159	21-Dec-11	
EPA 300.0	Chloride	mg/L	<0.20	0.07	0.20	W152159	21-Dec-11	
EPA 300.0	Sulfate as SO4	mg/L	<0.30	0.04	0.30	W152159	21-Dec-11	

Quality Control - LABORATORY CONTROL SAMPLE Data

Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	mg/L	0.00524	0.00500	105	85 - 115	W153118	03-Jan-12	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	mg/L	1.00	1.00	100	85 - 115	W152131	03-Jan-12	
EPA 200.7	Barium	mg/L	1.01	1.00	101	85 - 115	W152131	03-Jan-12	
EPA 200.7	Beryllium	mg/L	1.02	1.00	102	85 - 115	W152131	03-Jan-12	
EPA 200.7	Boron	mg/L	1.05	1.00	105	85 - 115	W152131	03-Jan-12	
EPA 200.7	Cadmium	mg/L	0.965	1.00	96.5	85 - 115	W152131	03-Jan-12	
EPA 200.7	Calcium	mg/L	19.1	20.0	95.7	85 - 115	W152131	03-Jan-12	
EPA 200.7	Chromium	mg/L	0.937	1.00	93.7	85 - 115	W152131	03-Jan-12	
EPA 200.7	Cobalt	mg/L	0.951	1.00	95.1	85 - 115	W152131	03-Jan-12	
EPA 200.7	Copper	mg/L	0.929	1.00	92.9	85 - 115	W152131	03-Jan-12	
EPA 200.7	Iron	mg/L	9.85	10.0	98.5	85 - 115	W152131	03-Jan-12	
EPA 200.7	Lead	mg/L	0.923	1.00	92.3	85 - 115	W152131	03-Jan-12	
EPA 200.7	Magnesium	mg/L	19.6	20.0	98.2	85 - 115	W152131	03-Jan-12	
EPA 200.7	Manganese	mg/L	1.01	1.00	101	85 - 115	W152131	03-Jan-12	
EPA 200.7	Molybdenum	mg/L	0.987	1.00	98.7	85 - 115	W152131	03-Jan-12	
EPA 200.7	Nickel	mg/L	0.902	1.00	90.2	85 - 115	W152131	03-Jan-12	
EPA 200.7	Potassium	mg/L	20.1	20.0	100	85 - 115	W152131	03-Jan-12	
EPA 200.7	Silicon	mg/L	5.33	5.00	107	85 - 115	W152131	03-Jan-12	
EPA 200.7	Silver	mg/L	0.0504	0.0500	101	85 - 115	W152131	03-Jan-12	
EPA 200.7	Sodium	mg/L	18.1	19.0	95.3	85 - 115	W152131	03-Jan-12	
EPA 200.7	Titanium	mg/L	1.01	1.00	101	85 - 115	W152131	03-Jan-12	
EPA 200.7	Vanadium	mg/L	0.966	1.00	96.6	85 - 115	W152131	03-Jan-12	
EPA 200.7	Zinc	mg/L	0.929	1.00	92.9	85 - 115	W152131	03-Jan-12	
EPA 200.8	Antimony	mg/L	0.0262	0.0250	105	85 - 115	W152144	27-Dec-11	
EPA 200.8	Arsenic	mg/L	0.0250	0.0250	99.9	85 - 115	W152144	27-Dec-11	
EPA 200.8	Selenium	mg/L	0.0252	0.0250	101	85 - 115	W152144	27-Dec-11	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245
Work Order: **W1L0358**
Reported: 05-Jan-12 11:40

Quality Control - LABORATORY CONTROL SAMPLE Data (Continued)									
Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes

Metals (Total Recoverable--reportable as Total per 40 CFR 136) (Continued)

EPA 200.8	Uranium	mg/L	0.0269	0.0250	107	85 - 115	W152144	27-Dec-11	
EPA 200.8	Thallium	mg/L	0.0261	0.0250	105	85 - 115	W152144	27-Dec-11	

Metals (Dissolved)

EPA 200.7	Aluminum	mg/L	1.02	1.00	102	85 - 115	W152073	01-Jan-12	
EPA 200.7	Barium	mg/L	1.07	1.00	107	85 - 115	W152073	01-Jan-12	
EPA 200.7	Beryllium	mg/L	1.05	1.00	105	85 - 115	W152073	01-Jan-12	
EPA 200.7	Boron	mg/L	1.08	1.00	108	85 - 115	W152073	01-Jan-12	
EPA 200.7	Cadmium	mg/L	1.01	1.00	101	85 - 115	W152073	01-Jan-12	
EPA 200.7	Calcium	mg/L	19.7	20.0	98.6	85 - 115	W152073	01-Jan-12	
EPA 200.7	Chromium	mg/L	1.00	1.00	100	85 - 115	W152073	01-Jan-12	
EPA 200.7	Cobalt	mg/L	1.01	1.00	101	85 - 115	W152073	01-Jan-12	
EPA 200.7	Copper	mg/L	1.04	1.00	104	85 - 115	W152073	01-Jan-12	
EPA 200.7	Iron	mg/L	9.94	10.0	99.4	85 - 115	W152073	01-Jan-12	
EPA 200.7	Lead	mg/L	1.02	1.00	102	85 - 115	W152073	01-Jan-12	
EPA 200.7	Magnesium	mg/L	20.7	20.0	103	85 - 115	W152073	01-Jan-12	
EPA 200.7	Manganese	mg/L	1.03	1.00	103	85 - 115	W152073	01-Jan-12	
EPA 200.7	Molybdenum	mg/L	1.01	1.00	101	85 - 115	W152073	01-Jan-12	
EPA 200.7	Nickel	mg/L	0.940	1.00	94.0	85 - 115	W152073	01-Jan-12	
EPA 200.7	Potassium	mg/L	19.3	20.0	96.3	85 - 115	W152073	30-Dec-11	
EPA 200.7	Silicon	mg/L	5.16	5.00	103	85 - 115	W152073	01-Jan-12	
EPA 200.7	Silver	mg/L	0.0503	0.0500	101	85 - 115	W152073	01-Jan-12	
EPA 200.7	Sodium	mg/L	19.9	19.0	105	85 - 115	W152073	01-Jan-12	
EPA 200.7	Titanium	mg/L	1.02	1.00	102	85 - 115	W152073	01-Jan-12	
EPA 200.7	Vanadium	mg/L	1.01	1.00	101	85 - 115	W152073	01-Jan-12	
EPA 200.7	Zinc	mg/L	1.01	1.00	101	85 - 115	W152073	01-Jan-12	
EPA 200.8	Antimony	mg/L	0.0246	0.0250	98.5	85 - 115	W152078	28-Dec-11	
EPA 200.8	Arsenic	mg/L	0.0255	0.0250	102	85 - 115	W152078	28-Dec-11	
EPA 200.8	Selenium	mg/L	0.0254	0.0250	101	85 - 115	W152078	28-Dec-11	
EPA 200.8	Thallium	mg/L	0.0248	0.0250	99.3	85 - 115	W152078	28-Dec-11	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	mg/L	0.156	0.150	104	85 - 115	W152125	21-Dec-11	
ASTM D7237	Cyanide (free)	mg/L	0.155	0.150	103	85 - 115	W152126	21-Dec-11	
ASTM D7237	Cyanide (free)	mg/L	0.161	0.150	107	85 - 115	W152277	23-Dec-11	
EPA 120.1	Specific conductance	µmhos/cm	485	479	101	90 - 110	W152085	20-Dec-11	
EPA 180.1	Turbidity	NTU	4.26	4.39	97.0	90 - 110	W152068	20-Dec-11	
EPA 335.4	Cyanide (total)	mg/L	0.149	0.150	99.3	90 - 110	W152129	21-Dec-11	
EPA 350.1	Ammonia as N	mg/L	0.785	0.750	105	90 - 110	W153120	03-Jan-12	
EPA 353.2	Nitrate/Nitrite as N	mg/L	1.88	2.00	94.0	90 - 110	W201034	04-Jan-12	
SM 4500-CN-I	Cyanide (WAD)	mg/L	0.157	0.150	105	90 - 110	W152228	23-Dec-11	
SM 4500-CN-I	Cyanide (WAD)	mg/L	0.152	0.150	101	90 - 110	W153021	27-Dec-11	
SM 4500-P-E	Phosphorus	mg/L	0.900	0.877	103	90 - 110	W153169	30-Dec-11	

Anions by Ion Chromatography

EPA 300.0	Fluoride	mg/L	1.98	2.00	99.2	90 - 110	W152159	21-Dec-11	
EPA 300.0	Chloride	mg/L	2.91	3.00	96.9	90 - 110	W152159	21-Dec-11	
EPA 300.0	Sulfate as SO4	mg/L	10.1	10.0	101	90 - 110	W152159	21-Dec-11	



Golder Associates (WA)
 18300 NE Union Hill Road, Suite 200
 Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0358**

Reported: 05-Jan-12 11:40

Quality Control - DUPLICATE Data

Method	Analyte	Units	Duplicate Result	Sample Result	RPD	RPD Limit	Batch ID	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	mg/L	<0.00020	<0.00020	UDL	20	W153118	03-Jan-12	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	mg/L	0.352	0.305	14.3	20	W152131	03-Jan-12	
EPA 200.7	Barium	mg/L	0.0132	0.0132	0.2	20	W152131	03-Jan-12	
EPA 200.7	Beryllium	mg/L	<0.0020	<0.0020	UDL	20	W152131	03-Jan-12	
EPA 200.7	Boron	mg/L	<0.040	<0.040	<RL	20	W152131	03-Jan-12	
EPA 200.7	Cadmium	mg/L	<0.0020	<0.0020	UDL	20	W152131	03-Jan-12	
EPA 200.7	Calcium	mg/L	4.28	4.22	1.4	20	W152131	03-Jan-12	
EPA 200.7	Chromium	mg/L	<0.0060	<0.0060	UDL	20	W152131	03-Jan-12	
EPA 200.7	Cobalt	mg/L	<0.0060	<0.0060	UDL	20	W152131	03-Jan-12	
EPA 200.7	Copper	mg/L	<0.010	<0.010	<RL	20	W152131	03-Jan-12	
EPA 200.7	Iron	mg/L	0.322	0.287	11.4	20	W152131	03-Jan-12	
EPA 200.7	Lead	mg/L	<0.0075	<0.0075	UDL	20	W152131	03-Jan-12	
EPA 200.7	Magnesium	mg/L	6.75	6.60	2.3	20	W152131	03-Jan-12	
EPA 200.7	Manganese	mg/L	0.106	0.104	2.5	20	W152131	03-Jan-12	
EPA 200.7	Molybdenum	mg/L	<0.008	<0.008	<RL	20	W152131	03-Jan-12	
EPA 200.7	Nickel	mg/L	<0.010	<0.010	<RL	20	W152131	03-Jan-12	
EPA 200.7	Potassium	mg/L	1.40	1.37	2.2	20	W152131	03-Jan-12	
EPA 200.7	Silicon	mg/L	25.8	25.3	2.1	20	W152131	03-Jan-12	
EPA 200.7	Silver	mg/L	<0.0050	<0.0050	UDL	20	W152131	03-Jan-12	
EPA 200.7	Sodium	mg/L	21.7	21.3	1.5	20	W152131	03-Jan-12	
EPA 200.7	Titanium	mg/L	<0.0050	<0.0050	<RL	20	W152131	03-Jan-12	
EPA 200.7	Vanadium	mg/L	<0.0050	<0.0050	UDL	20	W152131	03-Jan-12	
EPA 200.7	Zinc	mg/L	0.0467	0.0459	1.6	20	W152131	03-Jan-12	
EPA 200.8	Antimony	mg/L	<0.00300	<0.00300	<RL	20	W152144	27-Dec-11	
EPA 200.8	Arsenic	mg/L	<0.0030	<0.0030	<RL	20	W152144	27-Dec-11	
EPA 200.8	Selenium	mg/L	<0.00300	<0.00300	UDL	20	W152144	27-Dec-11	
EPA 200.8	Uranium	mg/L	<0.00100	<0.00100	<RL	20	W152144	27-Dec-11	
EPA 200.8	Thallium	mg/L	<0.00100	<0.00100	<RL	20	W152144	27-Dec-11	

Metals (Dissolved)

EPA 200.7	Aluminum	mg/L	<0.080	<0.080	UDL	20	W152073	01-Jan-12	
EPA 200.7	Barium	mg/L	0.136	0.136	0.2	20	W152073	01-Jan-12	
EPA 200.7	Beryllium	mg/L	<0.0020	<0.0020	UDL	20	W152073	01-Jan-12	
EPA 200.7	Boron	mg/L	0.138	0.137	0.4	20	W152073	01-Jan-12	
EPA 200.7	Cadmium	mg/L	<0.0020	<0.0020	UDL	20	W152073	01-Jan-12	
EPA 200.7	Calcium	mg/L	285	283	0.5	20	W152073	01-Jan-12	
EPA 200.7	Chromium	mg/L	<0.0060	<0.0060	UDL	20	W152073	01-Jan-12	
EPA 200.7	Cobalt	mg/L	<0.0060	<0.0060	<RL	20	W152073	01-Jan-12	
EPA 200.7	Copper	mg/L	<0.010	<0.010	UDL	20	W152073	01-Jan-12	
EPA 200.7	Iron	mg/L	1.73	1.72	0.6	20	W152073	01-Jan-12	
EPA 200.7	Lead	mg/L	<0.0075	<0.0075	UDL	20	W152073	01-Jan-12	
EPA 200.7	Magnesium	mg/L	65.3	64.8	0.7	20	W152073	01-Jan-12	
EPA 200.7	Manganese	mg/L	1.88	1.87	0.4	20	W152073	01-Jan-12	
EPA 200.7	Molybdenum	mg/L	0.011	0.012	8.8	20	W152073	01-Jan-12	
EPA 200.7	Nickel	mg/L	<0.010	<0.010	UDL	20	W152073	01-Jan-12	
EPA 200.7	Potassium	mg/L	5.42	5.61	3.6	20	W152073	30-Dec-11	
EPA 200.7	Silicon	mg/L	9.29	9.24	0.5	20	W152073	01-Jan-12	
EPA 200.7	Silver	mg/L	<0.0050	<0.0050	UDL	20	W152073	01-Jan-12	
EPA 200.7	Sodium	mg/L	63.4	62.9	0.9	20	W152073	01-Jan-12	
EPA 200.7	Titanium	mg/L	<0.0050	<0.0050	<RL	20	W152073	01-Jan-12	
EPA 200.7	Vanadium	mg/L	<0.0050	<0.0050	UDL	20	W152073	01-Jan-12	
EPA 200.7	Zinc	mg/L	<0.0100	<0.0100	<RL	20	W152073	01-Jan-12	
EPA 200.8	Antimony	mg/L	<0.00300	<0.00300	<RL	20	W152078	28-Dec-11	
EPA 200.8	Arsenic	mg/L	<0.0030	<0.0030	<RL	20	W152078	28-Dec-11	
EPA 200.8	Selenium	mg/L	<0.00300	<0.00300	UDL	20	W152078	28-Dec-11	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245
Work Order: **W1L0358**
Reported: 05-Jan-12 11:40

Quality Control - DUPLICATE Data (Continued)

Method	Analyte	Units	Duplicate Result	Sample Result	RPD	RPD Limit	Batch ID	Analyzed	Notes
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Metals (Dissolved) (Continued)

EPA 200.8	Thallium	mg/L	<0.00100	<0.00100	<RL	20	W152078	28-Dec-11	
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Classical Chemistry Parameters

EPA 120.1	Specific conductance	µmhos/cm	169	169	0.1	20	W152085	20-Dec-11	
EPA 180.1	Turbidity	NTU	10.2	11.3	10.2	20	W152068	20-Dec-11	
EPA 335.4	Cyanide (total)	mg/L	<0.0100	<0.0100	<RL	20	W152129	21-Dec-11	
EPA 350.1	Ammonia as N	mg/L	0.172	0.196	13.0	20	W153120	03-Jan-12	
EPA 353.2	Nitrate/Nitrite as N	mg/L	0.089	0.080	11.5	20	W201034	04-Jan-12	
SM 2320B/2310B	Total Alkalinity	mg/L	69.6	69.6	0.1	20	W152091	20-Dec-11	
SM 2320B/2310B	Bicarbonate	mg/L	69.6	69.6	0.1	20	W152091	20-Dec-11	
SM 2320B/2310B	Carbonate	mg/L	<1.0	<1.0	UDL	20	W152091	20-Dec-11	
SM 2540 C	Total Diss. Solids	mg/L	108	114	5.4	10	W152087	20-Dec-11	
SM 2540 D	Total Susp. Solids	mg/L	<10.0	<10.0	<RL	10	W152086	20-Dec-11	
SM 4500 H B	pH	pH Units	6.52	6.53	0.2	20	W152091	20-Dec-11	
SM 4500-CN-I	Cyanide (WAD)	mg/L	0.192	0.188	2.1	20	W153021	27-Dec-11	
SM 4500-CN-I	Cyanide (WAD)	mg/L	<0.0100	<0.0100	UDL	20	W152228	23-Dec-11	
SM 4500-P-E	Phosphorus	mg/L	0.136	0.137	1.2	20	W153169	30-Dec-11	

Anions by Ion Chromatography

EPA 300.0	Fluoride	mg/L	0.10	0.10	4.0	20	W152159	21-Dec-11	
EPA 300.0	Chloride	mg/L	7.49	7.47	0.2	20	W152159	21-Dec-11	
EPA 300.0	Sulfate as SO4	mg/L	8.54	8.54	0.0	20	W152159	21-Dec-11	

Quality Control - MATRIX SPIKE Data

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	mg/L	0.00100	<0.00020	0.00100	100	70 - 130	W153118	03-Jan-12	
EPA 245.1	Mercury	mg/L	0.00106	<0.00020	0.00100	106	70 - 130	W153118	03-Jan-12	

Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	mg/L	2.33	0.305	1.00	202	70 - 130	W152131	03-Jan-12	M1
EPA 200.7	Aluminum	mg/L	1.19	0.097	1.00	109	70 - 130	W152131	03-Jan-12	
EPA 200.7	Barium	mg/L	1.01	0.0132	1.00	99.6	70 - 130	W152131	03-Jan-12	
EPA 200.7	Barium	mg/L	1.01	0.0267	1.00	98.5	70 - 130	W152131	03-Jan-12	
EPA 200.7	Beryllium	mg/L	1.02	<0.0020	1.00	102	70 - 130	W152131	03-Jan-12	
EPA 200.7	Beryllium	mg/L	1.03	<0.0020	1.00	103	70 - 130	W152131	03-Jan-12	
EPA 200.7	Boron	mg/L	1.04	<0.040	1.00	103	70 - 130	W152131	03-Jan-12	
EPA 200.7	Boron	mg/L	1.07	<0.040	1.00	106	70 - 130	W152131	03-Jan-12	
EPA 200.7	Cadmium	mg/L	0.947	<0.0020	1.00	94.7	70 - 130	W152131	03-Jan-12	
EPA 200.7	Cadmium	mg/L	0.956	<0.0020	1.00	95.6	70 - 130	W152131	03-Jan-12	
EPA 200.7	Calcium	mg/L	23.3	4.22	20.0	95.3	70 - 130	W152131	03-Jan-12	
EPA 200.7	Calcium	mg/L	81.9	63.3	20.0	92.8	70 - 130	W152131	03-Jan-12	
EPA 200.7	Chromium	mg/L	0.932	<0.0060	1.00	93.2	70 - 130	W152131	03-Jan-12	
EPA 200.7	Chromium	mg/L	0.951	<0.0060	1.00	95.1	70 - 130	W152131	03-Jan-12	
EPA 200.7	Cobalt	mg/L	0.927	<0.0060	1.00	92.7	70 - 130	W152131	03-Jan-12	
EPA 200.7	Cobalt	mg/L	0.922	<0.0060	1.00	92.2	70 - 130	W152131	03-Jan-12	
EPA 200.7	Copper	mg/L	0.947	<0.010	1.00	94.5	70 - 130	W152131	03-Jan-12	
EPA 200.7	Copper	mg/L	0.939	<0.010	1.00	93.4	70 - 130	W152131	03-Jan-12	
EPA 200.7	Iron	mg/L	10.2	0.287	10.0	99.6	70 - 130	W152131	03-Jan-12	
EPA 200.7	Iron	mg/L	9.91	0.096	10.0	98.1	70 - 130	W152131	03-Jan-12	
EPA 200.7	Lead	mg/L	0.907	<0.0075	1.00	90.7	70 - 130	W152131	03-Jan-12	
EPA 200.7	Lead	mg/L	0.915	<0.0075	1.00	91.5	70 - 130	W152131	03-Jan-12	
EPA 200.7	Magnesium	mg/L	26.0	6.60	20.0	96.9	70 - 130	W152131	03-Jan-12	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0358**

Reported: 05-Jan-12 11:40

Quality Control - MATRIX SPIKE Data (Continued)

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Total Recoverable--reportable as Total per 40 CFR 136) (Continued)

EPA 200.7	Magnesium	mg/L	26.2	6.84	20.0	96.9	70 - 130	W152131	03-Jan-12	
EPA 200.7	Manganese	mg/L	1.10	0.104	1.00	99.2	70 - 130	W152131	03-Jan-12	
EPA 200.7	Manganese	mg/L	1.02	0.0069	1.00	101	70 - 130	W152131	03-Jan-12	
EPA 200.7	Molybdenum	mg/L	0.968	<0.008	1.00	96.5	70 - 130	W152131	03-Jan-12	
EPA 200.7	Molybdenum	mg/L	0.998	<0.008	1.00	99.2	70 - 130	W152131	03-Jan-12	
EPA 200.7	Nickel	mg/L	0.887	<0.010	1.00	88.3	70 - 130	W152131	03-Jan-12	
EPA 200.7	Nickel	mg/L	0.884	<0.010	1.00	88.4	70 - 130	W152131	03-Jan-12	
EPA 200.7	Potassium	mg/L	21.3	1.37	20.0	99.5	70 - 130	W152131	03-Jan-12	
EPA 200.7	Potassium	mg/L	22.2	1.53	20.0	103	70 - 130	W152131	03-Jan-12	
EPA 200.7	Silicon	mg/L	31.9	25.3	5.00	R > 4S	70 - 130	W152131	03-Jan-12	M3
EPA 200.7	Silicon	mg/L	9.95	4.48	5.00	109	70 - 130	W152131	03-Jan-12	
EPA 200.7	Silver	mg/L	0.0500	<0.0050	0.0500	100	70 - 130	W152131	03-Jan-12	
EPA 200.7	Silver	mg/L	0.0504	<0.0050	0.0500	101	70 - 130	W152131	03-Jan-12	
EPA 200.7	Sodium	mg/L	38.8	21.3	19.0	91.9	70 - 130	W152131	03-Jan-12	
EPA 200.7	Sodium	mg/L	28.3	9.77	19.0	97.4	70 - 130	W152131	03-Jan-12	
EPA 200.7	Titanium	mg/L	0.999	<0.0050	1.00	99.8	70 - 130	W152131	03-Jan-12	
EPA 200.7	Titanium	mg/L	0.995	<0.0050	1.00	99.4	70 - 130	W152131	03-Jan-12	
EPA 200.7	Vanadium	mg/L	0.955	<0.0050	1.00	95.5	70 - 130	W152131	03-Jan-12	
EPA 200.7	Vanadium	mg/L	0.986	<0.0050	1.00	98.5	70 - 130	W152131	03-Jan-12	
EPA 200.7	Zinc	mg/L	0.960	0.0459	1.00	91.4	70 - 130	W152131	03-Jan-12	
EPA 200.7	Zinc	mg/L	0.925	<0.0100	1.00	92.2	70 - 130	W152131	03-Jan-12	
EPA 200.8	Antimony	mg/L	0.0254	<0.00300	0.0250	101	70 - 130	W152144	27-Dec-11	
EPA 200.8	Antimony	mg/L	0.0258	<0.00300	0.0250	103	70 - 130	W152144	27-Dec-11	
EPA 200.8	Arsenic	mg/L	0.0263	<0.0030	0.0250	100	70 - 130	W152144	27-Dec-11	
EPA 200.8	Arsenic	mg/L	0.0301	<0.0030	0.0250	109	70 - 130	W152144	27-Dec-11	
EPA 200.8	Selenium	mg/L	0.0245	<0.00300	0.0250	98.0	70 - 130	W152144	27-Dec-11	
EPA 200.8	Selenium	mg/L	0.0302	<0.00300	0.0250	116	70 - 130	W152144	27-Dec-11	
EPA 200.8	Uranium	mg/L	0.0263	<0.00100	0.0250	104	70 - 130	W152144	27-Dec-11	
EPA 200.8	Uranium	mg/L	0.0272	<0.00100	0.0250	108	70 - 130	W152144	27-Dec-11	
EPA 200.8	Thallium	mg/L	0.0261	<0.00100	0.0250	104	70 - 130	W152144	27-Dec-11	
EPA 200.8	Thallium	mg/L	0.0249	<0.00100	0.0250	99.6	70 - 130	W152144	27-Dec-11	

Metals (Dissolved)

EPA 200.7	Aluminum	mg/L	1.03	<0.080	1.00	103	70 - 130	W152073	01-Jan-12	
EPA 200.7	Aluminum	mg/L	0.946	<0.080	1.00	92.2	70 - 130	W152073	01-Jan-12	
EPA 200.7	Barium	mg/L	1.18	0.136	1.00	105	70 - 130	W152073	01-Jan-12	
EPA 200.7	Barium	mg/L	0.943	0.0171	1.00	92.6	70 - 130	W152073	01-Jan-12	
EPA 200.7	Beryllium	mg/L	1.04	<0.0020	1.00	104	70 - 130	W152073	01-Jan-12	
EPA 200.7	Beryllium	mg/L	0.948	<0.0020	1.00	94.8	70 - 130	W152073	01-Jan-12	
EPA 200.7	Boron	mg/L	1.21	0.137	1.00	108	70 - 130	W152073	01-Jan-12	
EPA 200.7	Boron	mg/L	0.964	<0.040	1.00	94.8	70 - 130	W152073	01-Jan-12	
EPA 200.7	Cadmium	mg/L	1.00	<0.0020	1.00	100	70 - 130	W152073	01-Jan-12	
EPA 200.7	Cadmium	mg/L	0.931	<0.0020	1.00	93.1	70 - 130	W152073	01-Jan-12	
EPA 200.7	Calcium	mg/L	291	283	20.0	R > 4S	70 - 130	W152073	01-Jan-12	M3
EPA 200.7	Calcium	mg/L	25.5	7.67	20.0	89.0	70 - 130	W152073	01-Jan-12	
EPA 200.7	Chromium	mg/L	1.00	<0.0060	1.00	100	70 - 130	W152073	01-Jan-12	
EPA 200.7	Chromium	mg/L	0.919	<0.0060	1.00	91.9	70 - 130	W152073	01-Jan-12	
EPA 200.7	Cobalt	mg/L	0.977	<0.0060	1.00	97.6	70 - 130	W152073	01-Jan-12	
EPA 200.7	Cobalt	mg/L	0.922	<0.0060	1.00	91.9	70 - 130	W152073	01-Jan-12	
EPA 200.7	Copper	mg/L	1.06	<0.010	1.00	106	70 - 130	W152073	01-Jan-12	
EPA 200.7	Copper	mg/L	0.938	<0.010	1.00	93.8	70 - 130	W152073	01-Jan-12	
EPA 200.7	Iron	mg/L	11.3	1.72	10.0	96.3	70 - 130	W152073	01-Jan-12	
EPA 200.7	Iron	mg/L	11.2	2.19	10.0	90.2	70 - 130	W152073	01-Jan-12	
EPA 200.7	Lead	mg/L	1.02	<0.0075	1.00	102	70 - 130	W152073	01-Jan-12	
EPA 200.7	Lead	mg/L	0.943	<0.0075	1.00	94.3	70 - 130	W152073	01-Jan-12	
EPA 200.7	Magnesium	mg/L	79.8	64.8	20.0	75.1	70 - 130	W152073	01-Jan-12	
EPA 200.7	Magnesium	mg/L	23.7	4.98	20.0	93.4	70 - 130	W152073	01-Jan-12	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245
Work Order: **W1L0358**
Reported: 05-Jan-12 11:40

Quality Control - MATRIX SPIKE Data (Continued)

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Dissolved) (Continued)

EPA 200.7	Manganese	mg/L	2.79	1.87	1.00	91.6	70 - 130	W152073	01-Jan-12	
EPA 200.7	Manganese	mg/L	1.44	0.499	1.00	94.3	70 - 130	W152073	01-Jan-12	
EPA 200.7	Molybdenum	mg/L	1.03	0.012	1.00	102	70 - 130	W152073	01-Jan-12	
EPA 200.7	Molybdenum	mg/L	0.916	<0.008	1.00	91.4	70 - 130	W152073	01-Jan-12	
EPA 200.7	Nickel	mg/L	0.961	<0.010	1.00	96.1	70 - 130	W152073	01-Jan-12	
EPA 200.7	Nickel	mg/L	0.887	<0.010	1.00	87.7	70 - 130	W152073	01-Jan-12	
EPA 200.7	Potassium	mg/L	25.9	5.61	20.0	101	70 - 130	W152073	30-Dec-11	
EPA 200.7	Potassium	mg/L	22.4	0.82	20.0	108	70 - 130	W152073	30-Dec-11	
EPA 200.7	Silicon	mg/L	14.3	9.24	5.00	101	70 - 130	W152073	01-Jan-12	
EPA 200.7	Silicon	mg/L	17.1	12.2	5.00	99.0	70 - 130	W152073	01-Jan-12	
EPA 200.7	Silver	mg/L	0.0364	<0.0050	0.0500	72.8	70 - 130	W152073	01-Jan-12	
EPA 200.7	Silver	mg/L	0.0435	<0.0050	0.0500	87.0	70 - 130	W152073	01-Jan-12	
EPA 200.7	Sodium	mg/L	81.9	62.9	19.0	99.9	70 - 130	W152073	01-Jan-12	
EPA 200.7	Sodium	mg/L	39.9	21.9	19.0	94.3	70 - 130	W152073	01-Jan-12	
EPA 200.7	Titanium	mg/L	1.04	<0.0050	1.00	104	70 - 130	W152073	01-Jan-12	
EPA 200.7	Titanium	mg/L	0.933	<0.0050	1.00	93.2	70 - 130	W152073	01-Jan-12	
EPA 200.7	Vanadium	mg/L	1.04	<0.0050	1.00	104	70 - 130	W152073	01-Jan-12	
EPA 200.7	Vanadium	mg/L	0.927	<0.0050	1.00	92.7	70 - 130	W152073	01-Jan-12	
EPA 200.7	Zinc	mg/L	1.01	<0.0100	1.00	101	70 - 130	W152073	01-Jan-12	
EPA 200.7	Zinc	mg/L	0.971	0.0259	1.00	94.5	70 - 130	W152073	01-Jan-12	
EPA 200.8	Antimony	mg/L	0.0230	<0.00300	0.0250	90.9	70 - 130	W152078	28-Dec-11	
EPA 200.8	Arsenic	mg/L	0.0279	<0.0030	0.0250	106	70 - 130	W152078	28-Dec-11	
EPA 200.8	Selenium	mg/L	0.0289	<0.00300	0.0250	116	70 - 130	W152078	28-Dec-11	
EPA 200.8	Thallium	mg/L	0.0237	<0.00100	0.0250	94.5	70 - 130	W152078	28-Dec-11	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	mg/L	0.093	<0.005	0.100	92.9	85 - 115	W152125	21-Dec-11	
ASTM D7237	Cyanide (free)	mg/L	0.100	<0.005	0.100	98.8	85 - 115	W152126	21-Dec-11	
ASTM D7237	Cyanide (free)	mg/L	0.127	0.020	0.100	107	85 - 115	W152126	21-Dec-11	
ASTM D7237	Cyanide (free)	mg/L	2.30	2.23	0.100	R > 4S	85 - 115	W152125	21-Dec-11	D2,M3
ASTM D7237	Cyanide (free)	mg/L	0.105	<0.005	0.100	103	85 - 115	W152277	23-Dec-11	N3
EPA 335.4	Cyanide (total)	mg/L	0.112	<0.0100	0.100	103	90 - 110	W152129	21-Dec-11	
EPA 350.1	Ammonia as N	mg/L	0.655	0.196	0.500	91.7	90 - 110	W153120	03-Jan-12	
EPA 350.1	Ammonia as N	mg/L	0.484	<0.030	0.500	93.9	90 - 110	W153120	03-Jan-12	
EPA 353.2	Nitrate/Nitrite as N	mg/L	1.27	0.080	1.00	119	90 - 110	W201034	04-Jan-12	M1
EPA 353.2	Nitrate/Nitrite as N	mg/L	1.22	0.107	1.00	112	90 - 110	W201034	04-Jan-12	M1
SM 4500-CN-I	Cyanide (WAD)	mg/L	0.112	<0.0100	0.100	112	75 - 125	W152228	23-Dec-11	
SM 4500-CN-I	Cyanide (WAD)	mg/L	0.283	0.188	0.100	95.0	75 - 125	W153021	27-Dec-11	
SM 4500-CN-I	Cyanide (WAD)	mg/L	0.111	0.0150	0.100	96.0	75 - 125	W153021	27-Dec-11	
SM 4500-P-E	Phosphorus	mg/L	0.650	0.137	0.500	103	75 - 125	W153169	30-Dec-11	

Anions by Ion Chromatography

EPA 300.0	Fluoride	mg/L	2.30	0.10	2.00	110	90 - 110	W152159	21-Dec-11	
EPA 300.0	Fluoride	mg/L	2.20	<0.10	2.00	106	90 - 110	W152159	21-Dec-11	
EPA 300.0	Chloride	mg/L	10.6	7.47	3.00	104	90 - 110	W152159	21-Dec-11	
EPA 300.0	Chloride	mg/L	3.21	0.36	3.00	95.0	90 - 110	W152159	21-Dec-11	
EPA 300.0	Sulfate as SO4	mg/L	19.4	8.54	10.0	108	90 - 110	W152159	21-Dec-11	
EPA 300.0	Sulfate as SO4	mg/L	153	144	10.0	91.1	90 - 110	W152159	21-Dec-11	D2,M3



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: **Suriname - Merian Gold 2011 / 113-93245**

Work Order: **W1L0358**

Reported: 05-Jan-12 11:40

Quality Control - MATRIX SPIKE DUPLICATE Data

Method	Analyte	Units	MSD Result	Spike Result	Spike Level	RPD	RPD Limit	Batch ID	Analyzed	Notes
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Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	mg/L	2.35	2.30	0.100	2.4	20	W152125	21-Dec-11	D2,M3
ASTM D7237	Cyanide (free)	mg/L	0.097	0.100	0.100	3.1	20	W152126	21-Dec-11	
ASTM D7237	Cyanide (free)	mg/L	0.107	0.105	0.100	1.4	20	W152277	23-Dec-11	N3
SM 4500-CN-I	Cyanide (WAD)	mg/L	0.292	0.283	0.100	3.1	20	W153021	27-Dec-11	

Quality Control - POST DIGESTION SPIKE Data

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	mg/L	2.38	0.305	1.00	208	85 - 115	W152131	03-Jan-12	M1
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Metals (Dissolved)

EPA 200.7	Aluminum	mg/L	1.04	<0.080	1.00	104	85 - 115	W152073	01-Jan-12	
EPA 200.7	Iron	mg/L	12.1	1.72	10.0	103	85 - 115	W152073	01-Jan-12	
EPA 200.7	Sodium	mg/L	82.7	62.9	19.0	104	85 - 115	W152073	01-Jan-12	

Notes and Definitions

D2	Sample required dilution due to high concentration of target analyte.
D5	Sample required dilution to meet internal standard recovery limits.
H1	Sample analysis performed past holding time.
H3	Sample was received and analyzed past holding time.
H5	This test is specified to be performed in the field within 15 minutes of sampling; sample was received and analyzed past the regulatory holding time.
M1	Matrix spike recovery was high, but the LCS recovery was acceptable.
M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to spike level. The LCS was acceptable.
N3	Samples treated with Cadmium Carbonate for possible Sulfide interference.
Q5	Sample was received with inadequate preservation, but preserved by the laboratory.
LCS	Laboratory Control Sample (Blank Spike)
RPD	Relative Percent Difference
UDL	A result is less than the detection limit
R > 4S	% recovery not applicable, sample concentration more than four times greater than spike level
<RL	A result is less than the reporting limit
MRL	Method Reporting Limit
MDL	Method Detection Limit
N/A	Not Applicable



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W2B0099**

Reported: 17-Feb-12 13:12

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
TSF-PZ-7	W2B0099-01	Ground Water	25-Jan-12 11:10	06-Feb-2012
TSF-TW-2R	W2B0099-02	Ground Water	27-Jan-12 12:50	06-Feb-2012
TSF-PZ-2	W2B0099-03	Ground Water	27-Jan-12 11:21	06-Feb-2012
MA-PZ-1-TW	W2B0099-04	Ground Water	25-Jan-12 15:50	06-Feb-2012
TSF-TW-5	W2B0099-05	Ground Water	24-Jan-12 16:35	06-Feb-2012
TSF-TW-3	W2B0099-06	Ground Water	24-Jan-12 11:55	06-Feb-2012
M2-PZ-1-TW	W2B0099-07	Ground Water	26-Jan-12 11:50	06-Feb-2012
MA-TW-6	W2B0099-08	Ground Water	26-Jan-12 16:50	06-Feb-2012
TSF-MW-1	W2B0099-09	Ground Water	23-Jan-12 17:10	06-Feb-2012
DUP-100	W2B0099-10	Ground Water	—	06-Feb-2012

Solid samples are analyzed on an as-received, wet-weight basis, unless otherwise requested. Non-Detects are reported at the MDL.

Sample preparation is defined by the client as per their Data Quality Objectives.

This report supercedes any previous reports for this Work Order. The complete report includes pages for each sample, a full QC report, and a notes section.

The results presented in this report relate only to the samples, and meet all requirements of the NELAC Standards unless otherwise noted.

(Q6) SVL received the following containers outside of published EPA guidelines for preservation temperatures (0-6°C).

The guidelines do not pertain to nitric-preserved metals.

Default Cooler (Received Temperature: 13.6°C)

Labnumber	Container	Client ID	Labnumber	Container	Client ID
W2B0099-01 A	Raw HDPE	TSF-PZ-7	W2B0099-01 B	Sulfuric HDPE	TSF-PZ-7
W2B0099-02 A	Raw HDPE	TSF-TW-2R	W2B0099-02 B	Sulfuric HDPE	TSF-TW-2R
W2B0099-03 A	Raw HDPE	TSF-PZ-2	W2B0099-03 B	Sulfuric HDPE	TSF-PZ-2
W2B0099-04 A	Raw HDPE	MA-PZ-1-TW	W2B0099-04 B	Sulfuric HDPE	MA-PZ-1-TW
W2B0099-05 A	Raw HDPE	TSF-TW-5	W2B0099-05 B	Sulfuric HDPE	TSF-TW-5
W2B0099-06 A	Raw HDPE	TSF-TW-3	W2B0099-06 B	Sulfuric HDPE	TSF-TW-3
W2B0099-07 A	Raw HDPE	M2-PZ-1-TW	W2B0099-07 B	Sulfuric HDPE	M2-PZ-1-TW
W2B0099-08 A	Raw HDPE	MA-TW-6	W2B0099-08 B	Sulfuric HDPE	MA-TW-6
W2B0099-09 A	Raw HDPE	TSF-MW-1	W2B0099-09 B	Sulfuric HDPE	TSF-MW-1
W2B0099-10 A	Raw HDPE	DUP-100	W2B0099-10 B	Sulfuric HDPE	DUP-100

Case Narrative

02/10/12 HJG--TDS/TSS--All raw samples were inadvertently preserved by the laboratory with H2SO4. Analysis is specified to be done on raw sample; therefore results are compromised and estimated.

SVL will preserve a portion of the raw sample with H2SO4 for NO2/NO3 analysis.



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

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Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W2B0099**

Reported: 17-Feb-12 13:12

Client Sample ID: **TSF-PZ-7**

SVL Sample ID: **W2B0099-01 (Ground Water)**

Sample Report Page 1 of 1

Sampled: 25-Jan-12 11:10

Received: 06-Feb-12

Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Classical Chemistry Parameters

EPA 353.2	Nitrate/Nitrite as N	< 0.050	mg/L	0.050	0.015		W207020	RHW	02/15/12 13:19	
SM 2540 C	Total Diss. Solids	250	mg/L	100			W206149	JMS	02/08/12 14:23	H3,N1
SM 2540 D	Total Susp. Solids	7.0	mg/L	5.0			W206148	JMS	02/08/12 14:23	H3,N1

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



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Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W2B0099**

Reported: 17-Feb-12 13:12

Client Sample ID: **TSF-TW-2R**

SVL Sample ID: **W2B0099-02 (Ground Water)**

Sample Report Page 1 of 1

Sampled: 27-Jan-12 12:50

Received: 06-Feb-12

Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Classical Chemistry Parameters

EPA 353.2	Nitrate/Nitrite as N	< 0.050	mg/L	0.050	0.015		W207020	RHW	02/15/12 13:21	
SM 2540 C	Total Diss. Solids	< 100	mg/L	100			W206149	JMS	02/08/12 14:23	H3,N1
SM 2540 D	Total Susp. Solids	5.0	mg/L	5.0			W206148	JMS	02/08/12 14:23	H3,N1

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

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Laboratory Director



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Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W2B0099**

Reported: 17-Feb-12 13:12

Client Sample ID: **TSF-PZ-2**

SVL Sample ID: **W2B0099-03 (Ground Water)**

Sample Report Page 1 of 1

Sampled: 27-Jan-12 11:21

Received: 06-Feb-12

Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Classical Chemistry Parameters

EPA 353.2	Nitrate/Nitrite as N	0.183	mg/L	0.050	0.015		W207020	RHW	02/15/12 13:22	
SM 2540 C	Total Diss. Solids	470	mg/L	100			W206149	JMS	02/08/12 14:23	H3,N1
SM 2540 D	Total Susp. Solids	46.0	mg/L	5.0			W206148	JMS	02/08/12 14:23	H3,N1

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

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Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W2B0099**

Reported: 17-Feb-12 13:12

Client Sample ID: **MA-PZ-1-TW**

SVL Sample ID: **W2B0099-04 (Ground Water)**

Sample Report Page 1 of 1

Sampled: 25-Jan-12 15:50

Received: 06-Feb-12

Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Classical Chemistry Parameters

EPA 353.2	Nitrate/Nitrite as N	< 0.050	mg/L	0.050	0.015		W207020	RHW	02/15/12 13:23	
SM 2540 C	Total Diss. Solids	1040	mg/L	100			W206149	JMS	02/08/12 14:23	H3,N1
SM 2540 D	Total Susp. Solids	< 5.0	mg/L	5.0			W206148	JMS	02/08/12 14:23	H3,N1

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



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Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W2B0099**

Reported: 17-Feb-12 13:12

Client Sample ID: **TSF-TW-5**

SVL Sample ID: **W2B0099-05 (Ground Water)**

Sample Report Page 1 of 1

Sampled: 24-Jan-12 16:35

Received: 06-Feb-12

Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Classical Chemistry Parameters

EPA 353.2	Nitrate/Nitrite as N	< 0.050	mg/L	0.050	0.015		W207020	RHW	02/15/12 13:31	
SM 2540 C	Total Diss. Solids	< 100	mg/L	100			W206149	JMS	02/08/12 14:23	H3,N1
SM 2540 D	Total Susp. Solids	56.0	mg/L	5.0			W206148	JMS	02/08/12 14:23	H3,N1

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

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Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W2B0099**

Reported: 17-Feb-12 13:12

Client Sample ID: **TSF-TW-3**

SVL Sample ID: **W2B0099-06 (Ground Water)**

Sample Report Page 1 of 1

Sampled: 24-Jan-12 11:55

Received: 06-Feb-12

Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Classical Chemistry Parameters

EPA 353.2	Nitrate/Nitrite as N	0.672	mg/L	0.050	0.015		W207020	RHW	02/15/12 13:32	
SM 2540 C	Total Diss. Solids	< 100	mg/L	100			W206149	JMS	02/08/12 14:23	H3,N1
SM 2540 D	Total Susp. Solids	710	mg/L	50.0			W206148	JMS	02/08/12 14:23	H3,N1

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

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Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W2B0099**

Reported: 17-Feb-12 13:12

Client Sample ID: **M2-PZ-1-TW**

SVL Sample ID: **W2B0099-07 (Ground Water)**

Sample Report Page 1 of 1

Sampled: 26-Jan-12 11:50

Received: 06-Feb-12

Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Classical Chemistry Parameters

EPA 353.2	Nitrate/Nitrite as N	< 0.050	mg/L	0.050	0.015		W207020	RHW	02/15/12 13:33	
SM 2540 C	Total Diss. Solids	440	mg/L	100			W206149	JMS	02/08/12 14:23	H3,N1
SM 2540 D	Total Susp. Solids	26.0	mg/L	5.0			W206148	JMS	02/08/12 14:23	H3,N1

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

(208) 784-1258

Fax (208) 783-0891

Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W2B0099**

Reported: 17-Feb-12 13:12

Client Sample ID: **MA-TW-6**

SVL Sample ID: **W2B0099-08 (Ground Water)**

Sample Report Page 1 of 1

Sampled: 26-Jan-12 16:50

Received: 06-Feb-12

Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Classical Chemistry Parameters

EPA 353.2	Nitrate/Nitrite as N	0.538	mg/L	0.050	0.015		W207020	RHW	02/15/12 13:35	
SM 2540 C	Total Diss. Solids	710	mg/L	100			W206149	JMS	02/08/12 14:23	H3,N1
SM 2540 D	Total Susp. Solids	36.0	mg/L	5.0			W206148	JMS	02/08/12 14:23	H3,N1

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



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Kellogg ID 83837-0929

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Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W2B0099**

Reported: 17-Feb-12 13:12

Client Sample ID: **TSF-MW-1**

SVL Sample ID: **W2B0099-09 (Ground Water)**

Sample Report Page 1 of 1

Sampled: 23-Jan-12 17:10

Received: 06-Feb-12

Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Classical Chemistry Parameters

EPA 353.2	Nitrate/Nitrite as N	< 0.050	mg/L	0.050	0.015		W207020	RHW	02/15/12 13:36	
SM 2540 C	Total Diss. Solids	270	mg/L	100			W206149	JMS	02/08/12 14:23	H3,N1
SM 2540 D	Total Susp. Solids	6.0	mg/L	5.0			W206148	JMS	02/08/12 14:23	H3,N1

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



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Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W2B0099**

Reported: 17-Feb-12 13:12

Client Sample ID: **DUP-100**

SVL Sample ID: **W2B0099-10 (Ground Water)**

Sample Report Page 1 of 1

Sampled: —

Received: 06-Feb-12

Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Classical Chemistry Parameters

EPA 353.2	Nitrate/Nitrite as N	0.150	mg/L	0.050	0.015		W207020	RHW	02/15/12 13:38	
SM 2540 C	Total Diss. Solids	120	mg/L	100			W206149	JMS	02/08/12 14:23	H3,N1
SM 2540 D	Total Susp. Solids	48.0	mg/L	5.0			W206148	JMS	02/08/12 14:23	H3,N1

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



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Kellogg ID 83837-0929

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Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W2B0099**

Reported: 17-Feb-12 13:12

Quality Control - BLANK Data

Method	Analyte	Units	Result	MDL	MRL	Batch ID	Analyzed	Notes
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Classical Chemistry Parameters

EPA 353.2	Nitrate/Nitrite as N	mg/L	<0.050	0.015	0.050	W207020	15-Feb-12	
SM 2540 C	Total Diss. Solids	mg/L	<10		10	W206149	08-Feb-12	
SM 2540 D	Total Susp. Solids	mg/L	<5.0		5.0	W206148	08-Feb-12	

Quality Control - LABORATORY CONTROL SAMPLE Data

Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Classical Chemistry Parameters

EPA 353.2	Nitrate/Nitrite as N	mg/L	2.00	2.00	100	90 - 110	W207020	15-Feb-12	
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Quality Control - DUPLICATE Data

Method	Analyte	Units	Duplicate Result	Sample Result	RPD	RPD Limit	Batch ID	Analyzed	Notes
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Classical Chemistry Parameters

EPA 353.2	Nitrate/Nitrite as N	mg/L	1.54	1.48	3.7	20	W207020	15-Feb-12	
SM 2540 C	Total Diss. Solids	mg/L	260	1040	120.0	10	W206149	08-Feb-12	R1
SM 2540 D	Total Susp. Solids	mg/L	5.0	<5.0	<RL	10	W206148	08-Feb-12	R1

Quality Control - MATRIX SPIKE Data

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Classical Chemistry Parameters

EPA 353.2	Nitrate/Nitrite as N	mg/L	2.71	1.48	1.00	122	90 - 110	W207020	15-Feb-12	M1
EPA 353.2	Nitrate/Nitrite as N	mg/L	1.25	<0.050	1.00	122	90 - 110	W207020	15-Feb-12	M1

Quality Control - MATRIX SPIKE DUPLICATE Data

Method	Analyte	Units	MSD Result	Spike Result	Spike Level	RPD	RPD Limit	Batch ID	Analyzed	Notes
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Classical Chemistry Parameters

EPA 353.2	Nitrate/Nitrite as N	mg/L	2.74	2.71	1.00	1.4	20	W207020	15-Feb-12	M1
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Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W2B0099**

Reported: 17-Feb-12 13:12

Notes and Definitions

H3	Sample was received and analyzed past holding time.
M1	Matrix spike recovery was high, but the LCS recovery was acceptable.
N1	See case narrative.
R1	RPD exceeded the method acceptance limit.
LCS	Laboratory Control Sample (Blank Spike)
RPD	Relative Percent Difference
UDL	A result is less than the detection limit
R > 4S	% recovery not applicable, sample concentration more than four times greater than spike level
<RL	A result is less than the reporting limit
MRL	Method Reporting Limit
MDL	Method Detection Limit
N/A	Not Applicable



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace Ste 201
Boise, ID 83707

Project Name: **Suriname Merian 2012 / 113-93245**

Work Order: **W2B0100**

Reported: 23-Feb-12 10:43

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
TSF-TW-2R	W2B0100-01	Ground Water	27-Jan-12 12:50	06-Feb-2012
TSF-PZ-2	W2B0100-02	Ground Water	27-Jan-12 11:21	06-Feb-2012
MA-PZ-1-TW	W2B0100-03	Ground Water	25-Jan-12 15:50	06-Feb-2012
TSF-TW-5	W2B0100-04	Ground Water	24-Jan-12 16:35	06-Feb-2012
TSF-TW-3	W2B0100-05	Ground Water	24-Jan-12 11:55	06-Feb-2012
TSF-PZ-7	W2B0100-06	Ground Water	25-Jan-12 11:10	06-Feb-2012
MA-TW-6	W2B0100-07	Ground Water	26-Jan-12 16:50	06-Feb-2012
TSF-MW-1	W2B0100-08	Ground Water	23-Jan-12 17:10	06-Feb-2012
DUP-100	W2B0100-09	Ground Water	—	06-Feb-2012
M2-PZ-1-TW	W2B0100-10	Ground Water	26-Jan-12 11:50	06-Feb-2012

Solid samples are analyzed on an as-received, wet-weight basis, unless otherwise requested. Non-Detects are reported at the MDL.

Sample preparation is defined by the client as per their Data Quality Objectives.

This report supercedes any previous reports for this Work Order. The complete report includes pages for each sample, a full QC report, and a notes section.

The results presented in this report relate only to the samples, and meet all requirements of the NELAC Standards unless otherwise noted.

(Q6) SVL received the following containers outside of published EPA guidelines for preservation temperatures (0-6°C).

The guidelines do not pertain to nitric-preserved metals.

Default Cooler (Received Temperature: 13.0°C)

Labnumber	Container	Client ID	Labnumber	Container	Client ID
W2B0100-01 A	Raw HDPE	TSF-TW-2R	W2B0100-01 B	Sulfuric HDPE	TSF-TW-2R
W2B0100-01 C	Filtered nitric HDPE	TSF-TW-2R	W2B0100-01 D	NaOH HDPE	TSF-TW-2R
W2B0100-01 E	Nitric HDPE	TSF-TW-2R	W2B0100-02 A	Raw HDPE	TSF-PZ-2
W2B0100-02 B	Sulfuric HDPE	TSF-PZ-2	W2B0100-02 C	Filtered nitric HDPE	TSF-PZ-2
W2B0100-02 D	NaOH HDPE	TSF-PZ-2	W2B0100-02 E	Nitric HDPE	TSF-PZ-2
W2B0100-03 A	Raw HDPE	MA-PZ-1-TW	W2B0100-03 B	Sulfuric HDPE	MA-PZ-1-TW
W2B0100-03 C	Filtered nitric HDPE	MA-PZ-1-TW	W2B0100-03 D	NaOH HDPE	MA-PZ-1-TW
W2B0100-03 E	Nitric HDPE	MA-PZ-1-TW	W2B0100-04 A	Raw HDPE	TSF-TW-5
W2B0100-04 B	Sulfuric HDPE	TSF-TW-5	W2B0100-04 C	Filtered nitric HDPE	TSF-TW-5
W2B0100-04 D	NaOH HDPE	TSF-TW-5	W2B0100-04 E	Nitric HDPE	TSF-TW-5
W2B0100-05 A	Raw HDPE	TSF-TW-3	W2B0100-05 B	Sulfuric HDPE	TSF-TW-3
W2B0100-05 C	Filtered nitric HDPE	TSF-TW-3	W2B0100-05 D	NaOH HDPE	TSF-TW-3
W2B0100-05 E	Nitric HDPE	TSF-TW-3	W2B0100-06 A	Raw HDPE	TSF-PZ-7
W2B0100-06 B	Sulfuric HDPE	TSF-PZ-7	W2B0100-06 C	Filtered nitric HDPE	TSF-PZ-7
W2B0100-06 D	NaOH HDPE	TSF-PZ-7	W2B0100-06 E	Nitric HDPE	TSF-PZ-7
W2B0100-07 A	Raw HDPE	MA-TW-6	W2B0100-07 B	Sulfuric HDPE	MA-TW-6
W2B0100-07 C	Filtered nitric HDPE	MA-TW-6	W2B0100-07 D	NaOH HDPE	MA-TW-6
W2B0100-07 E	Nitric HDPE	MA-TW-6	W2B0100-08 A	Raw HDPE	TSF-MW-1
W2B0100-08 B	Sulfuric HDPE	TSF-MW-1	W2B0100-08 C	Filtered nitric HDPE	TSF-MW-1
W2B0100-08 D	NaOH HDPE	TSF-MW-1	W2B0100-08 E	Nitric HDPE	TSF-MW-1
W2B0100-09 A	Raw HDPE	DUP-100	W2B0100-09 B	Sulfuric HDPE	DUP-100
W2B0100-09 C	Filtered nitric HDPE	DUP-100	W2B0100-09 D	NaOH HDPE	DUP-100
W2B0100-09 E	Nitric HDPE	DUP-100	W2B0100-10 A	Raw HDPE	M2-PZ-1-TW
W2B0100-10 B	Sulfuric HDPE	M2-PZ-1-TW	W2B0100-10 C	Filtered nitric HDPE	M2-PZ-1-TW
W2B0100-10 D	NaOH HDPE	M2-PZ-1-TW	W2B0100-10 E	Nitric HDPE	M2-PZ-1-TW



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

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Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace Ste 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: **W2B0100**

Reported: 23-Feb-12 10:43

Case Narrative

02/23/12 DG: NO3+NO2 analysis on sample -02 was performed on the unpreserved bottle. The H2SO4 preserved bottle for sample -02 appears to have been preserved with HNO3 as well.



Tetra Tech EM, Inc. (Boise)
 3380 Americana Terrace Ste 201
 Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: **W2B0100**

Reported: 23-Feb-12 10:43

Client Sample ID: **TSF-TW-2R**

SVL Sample ID: **W2B0100-01 (Ground Water)**

Sample Report Page 1 of 3

Sampled: 27-Jan-12 12:50

Received: 06-Feb-12

Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W206189	DJA	02/13/12 10:21	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.008		W206246	TJK	02/13/12 13:22	
EPA 200.7	Barium	0.0044	mg/L	0.0020	0.0002		W206246	TJK	02/13/12 13:22	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W206246	TJK	02/13/12 13:22	
EPA 200.7	Calcium	0.854	mg/L	0.040	0.006		W206246	TJK	02/13/12 13:22	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0003		W206246	TJK	02/13/12 13:22	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W206246	TJK	02/13/12 13:22	
EPA 200.7	Iron	0.148	mg/L	0.060	0.008		W206246	TJK	02/13/12 13:22	
EPA 200.7	Magnesium	1.94	mg/L	0.060	0.010		W206246	TJK	02/13/12 13:22	
EPA 200.7	Manganese	0.0182	mg/L	0.0040	0.0006		W206246	TJK	02/13/12 13:22	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.0006		W206246	TJK	02/13/12 13:22	
EPA 200.7	Nickel	0.011	mg/L	0.010	0.002		W206246	TJK	02/13/12 13:22	
EPA 200.7	Potassium	< 0.50	mg/L	0.50	0.03		W206246	TJK	02/13/12 13:22	
EPA 200.7	Silicon	7.94	mg/L	0.08	0.01		W206246	TJK	02/13/12 13:22	
EPA 200.7	Sodium	3.88	mg/L	0.50	0.02		W206246	TJK	02/13/12 13:22	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0002		W206246	TJK	02/13/12 13:22	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0002		W206246	TJK	02/13/12 13:22	
EPA 200.7	Zinc	0.630	mg/L	0.0100	0.0010		W206246	TJK	02/13/12 13:22	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W206207	KWH	02/20/12 11:47	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W206207	KWH	02/20/12 11:47	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000096	2.5	W206207	KWH	02/20/12 14:06	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.00002	2.5	W206207	KWH	02/20/12 11:47	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.00009	2.5	W206207	KWH	02/20/12 11:47	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000016	2.5	W206207	KWH	02/20/12 11:47	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W206207	KWH	02/20/12 11:47	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.000009	2.5	W206207	KWH	02/20/12 11:47	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000004	2.5	W206207	KWH	02/20/12 11:47	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000006	2.5	W206207	KWH	02/20/12 11:47	
SM 2340B	Hardness (as CaCO3)	10.7	mg/L	0.347	0.116		N/A		02/15/12 13:11	



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace Ste 201
Boise, ID 83707

Project Name: **Suriname Merian 2012 / 113-93245**

Work Order: **W2B0100**

Reported: 23-Feb-12 10:43

Client Sample ID: **TSF-TW-2R**

SVL Sample ID: **W2B0100-01 (Ground Water)**

Sample Report Page 2 of 3

Sampled: 27-Jan-12 12:50

Received: 06-Feb-12

Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.016		W206227	AS	02/15/12 13:11	
EPA 200.7	Barium	0.0043	mg/L	0.0020	0.0004		W206227	AS	02/15/12 13:11	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W206227	AS	02/15/12 13:11	
EPA 200.7	Calcium	0.919	mg/L	0.040	0.012		W206227	AS	02/15/12 13:11	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W206227	AS	02/15/12 13:11	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W206227	AS	02/15/12 13:11	
EPA 200.7	Iron	< 0.060	mg/L	0.060	0.017		W206227	AS	02/15/12 13:11	
EPA 200.7	Magnesium	2.03	mg/L	0.060	0.021		W206227	AS	02/15/12 13:11	
EPA 200.7	Manganese	0.0227	mg/L	0.0040	0.0011		W206227	AS	02/15/12 13:11	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W206227	AS	02/15/12 13:11	
EPA 200.7	Nickel	0.016	mg/L	0.010	0.003		W206227	AS	02/15/12 13:11	
EPA 200.7	Potassium	< 0.50	mg/L	0.50	0.07		W206227	AS	02/15/12 13:11	
EPA 200.7	Silicon	8.10	mg/L	0.08	0.03		W206227	AS	02/15/12 13:11	
EPA 200.7	Sodium	3.88	mg/L	0.50	0.04		W206227	AS	02/15/12 13:11	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W206227	AS	02/15/12 13:11	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W206227	AS	02/15/12 13:11	
EPA 200.7	Zinc	0.610	mg/L	0.0100	0.0021		W206227	AS	02/15/12 13:11	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W206208	KWH	02/20/12 11:06	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W206208	KWH	02/20/12 11:06	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000077		W206208	KWH	02/20/12 13:33	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.000013		W206208	KWH	02/20/12 11:06	
EPA 200.8	Copper	0.00120	mg/L	0.00100	0.000072		W206208	KWH	02/20/12 11:06	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000013		W206208	KWH	02/20/12 11:06	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W206208	KWH	02/20/12 11:06	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.0000074		W206208	KWH	02/20/12 11:06	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000033		W206208	KWH	02/20/12 11:06	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000049		W206208	KWH	02/20/12 11:06	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W206190	DJA	02/13/12 10:21	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0005		W206262	IIT	02/10/12 17:03	
EPA 120.1	Specific conductance	45.0	µmhos/cm	5.00			W206216	JMS	02/10/12 08:22	
EPA 180.1	Turbidity	1.03	NTU	0.100			W206197	SM	02/09/12 12:18	H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W206213	IIT	02/10/12 12:43	
EPA 350.1	Ammonia as N	0.077	mg/L	0.030	0.006		W207052	RHW	02/14/12 07:54	
EPA 353.2	Nitrate/Nitrite as N	0.164	mg/L	0.050	0.015		W207019	RHW	02/15/12 12:34	
SM 2320B/2310B	Bicarbonate	11.3	mg/L	1.0	0.5		W206198	DKS	02/09/12 12:24	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.5		W206198	DKS	02/09/12 12:24	
SM 2320B/2310B	Total Alkalinity	11.3	mg/L	1.0	0.5		W206198	DKS	02/09/12 12:24	
SM 2540 C	Total Diss. Solids	24	mg/L	20			W206218	JMS	02/10/12 12:25	H3
SM 2540 D	Total Susp. Solids	< 10.0	mg/L	10.0			W206217	JMS	02/10/12 12:25	H3
SM 4500 H B	pH @24.0°C	5.51	pH Units				W206198	DKS	02/09/12 12:24	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W206212	IIT	02/10/12 12:09	
SM 4500-P-E	Phosphorus	0.017	mg/L	0.010	0.004		W207041	SM	02/16/12 15:48	



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Kellogg ID 83837-0929

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Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace Ste 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: **W2B0100**

Reported: 23-Feb-12 10:43

Client Sample ID: **TSF-TW-2R**

SVL Sample ID: **W2B0100-01 (Ground Water)**

Sample Report Page 3 of 3

Sampled: 27-Jan-12 12:50

Received: 06-Feb-12

Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	4.90	mg/L	0.20	0.07		W207035	AEW	02/13/12 19:25	
EPA 300.0	Fluoride	< 0.10	mg/L	0.10	0.02		W207035	AEW	02/13/12 19:25	
EPA 300.0	Sulfate as SO4	0.95	mg/L	0.30	0.04		W207035	AEW	02/13/12 19:25	

Cation/Anion Balance and TDS Ratios

Cation Sum: 0.40 meq/L Anion Sum: 0.40 meq/L C/A Balance: 0.20 % Calculated TDS: 42 TDS/cTDS: 0.57 TDS/eC: 0.53

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace Ste 201
Boise, ID 83707

Project Name: **Suriname Merian 2012 / 113-93245**

Work Order: **W2B0100**

Reported: 23-Feb-12 10:43

Client Sample ID: **TSF-PZ-2**

SVL Sample ID: **W2B0100-02 (Ground Water)**

Sample Report Page 1 of 3

Sampled: 27-Jan-12 11:21

Received: 06-Feb-12

Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W206189	DJA	02/13/12 10:30	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	0.759	mg/L	0.080	0.008		W206246	TJK	02/13/12 13:28	
EPA 200.7	Barium	0.0089	mg/L	0.0020	0.0002		W206246	TJK	02/13/12 13:28	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W206246	TJK	02/13/12 13:28	
EPA 200.7	Calcium	0.503	mg/L	0.040	0.006		W206246	TJK	02/13/12 13:28	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0003		W206246	TJK	02/13/12 13:28	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W206246	TJK	02/13/12 13:28	
EPA 200.7	Iron	0.631	mg/L	0.060	0.008		W206246	TJK	02/13/12 13:28	
EPA 200.7	Magnesium	0.217	mg/L	0.060	0.010		W206246	TJK	02/13/12 13:28	
EPA 200.7	Manganese	0.0519	mg/L	0.0040	0.0006		W206246	TJK	02/13/12 13:28	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.0006		W206246	TJK	02/13/12 13:28	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W206246	TJK	02/13/12 13:28	
EPA 200.7	Potassium	0.95	mg/L	0.50	0.03		W206246	TJK	02/13/12 13:28	
EPA 200.7	Silicon	14.1	mg/L	0.08	0.01		W206246	TJK	02/13/12 13:28	
EPA 200.7	Sodium	17.0	mg/L	0.50	0.02		W206246	TJK	02/13/12 13:28	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0002		W206246	TJK	02/13/12 13:28	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0002		W206246	TJK	02/13/12 13:28	
EPA 200.7	Zinc	0.0841	mg/L	0.0100	0.0010		W206246	TJK	02/13/12 13:28	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W206207	KWH	02/20/12 11:49	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W206207	KWH	02/20/12 11:49	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000096	2.5	W206207	KWH	02/20/12 14:08	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.00002	2.5	W206207	KWH	02/20/12 11:49	
EPA 200.8	Copper	0.00121	mg/L	0.00100	0.00009	2.5	W206207	KWH	02/20/12 11:49	
EPA 200.8	Lead	0.00401	mg/L	0.00300	0.000016	2.5	W206207	KWH	02/20/12 11:49	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W206207	KWH	02/20/12 11:49	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.000009	2.5	W206207	KWH	02/20/12 11:49	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000004	2.5	W206207	KWH	02/20/12 11:49	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000006	2.5	W206207	KWH	02/20/12 11:49	
SM 2340B	Hardness (as CaCO3)	0.761	mg/L	0.347	0.116		N/A		02/15/12 13:16	



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace Ste 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2B0100**
Reported: 23-Feb-12 10:43

Client Sample ID: **TSF-PZ-2**

SVL Sample ID: **W2B0100-02 (Ground Water)**

Sample Report Page 2 of 3

Sampled: 27-Jan-12 11:21
Received: 06-Feb-12
Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	0.132	mg/L	0.080	0.016		W206227	AS	02/15/12 13:16	
EPA 200.7	Barium	0.0026	mg/L	0.0020	0.0004		W206227	AS	02/15/12 13:16	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W206227	AS	02/15/12 13:16	
EPA 200.7	Calcium	0.196	mg/L	0.040	0.012		W206227	AS	02/15/12 13:16	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W206227	AS	02/15/12 13:16	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W206227	AS	02/15/12 13:16	
EPA 200.7	Iron	0.193	mg/L	0.060	0.017		W206227	AS	02/15/12 13:16	
EPA 200.7	Magnesium	0.066	mg/L	0.060	0.021		W206227	AS	02/15/12 13:16	
EPA 200.7	Manganese	0.0204	mg/L	0.0040	0.0011		W206227	AS	02/15/12 13:16	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W206227	AS	02/15/12 13:16	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W206227	AS	02/15/12 13:16	
EPA 200.7	Potassium	0.97	mg/L	0.50	0.07		W206227	AS	02/15/12 13:16	
EPA 200.7	Silicon	12.8	mg/L	0.08	0.03		W206227	AS	02/15/12 13:16	
EPA 200.7	Sodium	16.6	mg/L	0.50	0.04		W206227	AS	02/15/12 13:16	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W206227	AS	02/15/12 13:16	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W206227	AS	02/15/12 13:16	
EPA 200.7	Zinc	0.0354	mg/L	0.0100	0.0021		W206227	AS	02/15/12 13:16	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W206208	KWH	02/20/12 11:11	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W206208	KWH	02/20/12 11:11	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000077		W206208	KWH	02/20/12 13:38	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.000013		W206208	KWH	02/20/12 11:11	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.000072		W206208	KWH	02/20/12 11:11	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000013		W206208	KWH	02/20/12 11:11	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W206208	KWH	02/20/12 11:11	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.0000074		W206208	KWH	02/20/12 11:11	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000033		W206208	KWH	02/20/12 11:11	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000049		W206208	KWH	02/20/12 11:11	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W206190	DJA	02/13/12 10:30	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0005		W206262	IIT	02/10/12 17:05	
EPA 120.1	Specific conductance	84.0	µmhos/cm	5.00			W206216	JMS	02/10/12 08:22	
EPA 180.1	Turbidity	7.19	NTU	0.100			W206197	SM	02/09/12 12:18	H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W206213	IIT	02/10/12 12:45	
EPA 350.1	Ammonia as N	0.156	mg/L	0.030	0.006		W207052	RHW	02/14/12 07:16	
EPA 353.2	Nitrate/Nitrite as N	0.151	mg/L	0.050	0.015		W208104	SM	02/22/12 16:17	N1,Q13
SM 2320B/2310B	Bicarbonate	24.4	mg/L	1.0	0.5		W206198	DKS	02/09/12 12:30	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.5		W206198	DKS	02/09/12 12:30	
SM 2320B/2310B	Total Alkalinity	24.4	mg/L	1.0	0.5		W206198	DKS	02/09/12 12:30	
SM 2540 C	Total Diss. Solids	92	mg/L	20			W206218	JMS	02/10/12 12:25	H3
SM 2540 D	Total Susp. Solids	12.0	mg/L	10.0			W206217	JMS	02/10/12 12:25	H3
SM 4500 H B	pH @24.0°C	5.86	pH Units				W206198	DKS	02/09/12 12:30	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W206212	IIT	02/10/12 12:11	
SM 4500-P-E	Phosphorus	0.016	mg/L	0.010	0.004		W207041	SM	02/16/12 15:48	



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Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace Ste 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: **W2B0100**

Reported: 23-Feb-12 10:43

Client Sample ID: **TSF-PZ-2**

SVL Sample ID: **W2B0100-02 (Ground Water)**

Sample Report Page 3 of 3

Sampled: 27-Jan-12 11:21

Received: 06-Feb-12

Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	4.12	mg/L	0.20	0.07		W207035	AEW	02/13/12 19:58	
EPA 300.0	Fluoride	< 0.10	mg/L	0.10	0.02		W207035	AEW	02/13/12 19:58	
EPA 300.0	Sulfate as SO4	10.7	mg/L	0.30	0.04		W207035	AEW	02/13/12 19:58	

Cation/Anion Balance and TDS Ratios

Cation Sum: 0.80 meq/L Anion Sum: 0.84 meq/L C/A Balance: -2.59 % Calculated TDS: 85 TDS/cTDS: 1.08 TDS/eC: 1.10

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace Ste 201
Boise, ID 83707

Project Name: **Suriname Merian 2012 / 113-93245**

Work Order: **W2B0100**

Reported: 23-Feb-12 10:43

Client Sample ID: **MA-PZ-1-TW**

SVL Sample ID: **W2B0100-03 (Ground Water)**

Sample Report Page 1 of 3

Sampled: 25-Jan-12 15:50

Received: 06-Feb-12

Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total)										
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W206189	DJA	02/13/12 10:31	
Metals (Total Recoverable--reportable as Total per 40 CFR 136)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.008		W206246	TJK	02/13/12 13:34	
EPA 200.7	Barium	0.0268	mg/L	0.0020	0.0002		W206246	TJK	02/13/12 13:34	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W206246	TJK	02/13/12 13:34	
EPA 200.7	Calcium	31.1	mg/L	0.040	0.006		W206246	TJK	02/13/12 13:34	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0003		W206246	TJK	02/13/12 13:34	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W206246	TJK	02/13/12 13:34	
EPA 200.7	Iron	0.886	mg/L	0.060	0.008		W206246	TJK	02/13/12 13:34	
EPA 200.7	Magnesium	16.8	mg/L	0.060	0.010		W206246	TJK	02/13/12 13:34	
EPA 200.7	Manganese	0.670	mg/L	0.0040	0.0006		W206246	TJK	02/13/12 13:34	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.0006		W206246	TJK	02/13/12 13:34	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W206246	TJK	02/13/12 13:34	
EPA 200.7	Potassium	0.83	mg/L	0.50	0.03		W206246	TJK	02/13/12 13:34	
EPA 200.7	Silicon	30.2	mg/L	0.08	0.01		W206246	TJK	02/13/12 13:34	
EPA 200.7	Sodium	21.4	mg/L	0.50	0.02		W206246	TJK	02/13/12 13:34	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0002		W206246	TJK	02/13/12 13:34	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0002		W206246	TJK	02/13/12 13:34	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0010		W206246	TJK	02/13/12 13:34	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W206207	KWH	02/20/12 11:51	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W206207	KWH	02/20/12 11:51	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000096	2.5	W206207	KWH	02/20/12 14:10	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.00002	2.5	W206207	KWH	02/20/12 11:51	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.00009	2.5	W206207	KWH	02/20/12 11:51	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000016	2.5	W206207	KWH	02/20/12 11:51	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W206207	KWH	02/20/12 11:51	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.000009	2.5	W206207	KWH	02/20/12 11:51	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000004	2.5	W206207	KWH	02/20/12 11:51	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000006	2.5	W206207	KWH	02/20/12 11:51	
SM 2340B	Hardness (as CaCO3)	150	mg/L	0.347	0.116		N/A		02/15/12 13:22	



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace Ste 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: **W2B0100**

Reported: 23-Feb-12 10:43

Client Sample ID: **MA-PZ-1-TW**

Sampled: 25-Jan-12 15:50

SVL Sample ID: **W2B0100-03 (Ground Water)**

Received: 06-Feb-12

Sample Report Page 2 of 3

Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.016		W206227	AS	02/15/12 13:22	
EPA 200.7	Barium	0.0280	mg/L	0.0020	0.0004		W206227	AS	02/15/12 13:22	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W206227	AS	02/15/12 13:22	
EPA 200.7	Calcium	31.8	mg/L	0.040	0.012		W206227	AS	02/15/12 13:22	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W206227	AS	02/15/12 13:22	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W206227	AS	02/15/12 13:22	
EPA 200.7	Iron	0.991	mg/L	0.060	0.017		W206227	AS	02/15/12 13:22	
EPA 200.7	Magnesium	17.2	mg/L	0.060	0.021		W206227	AS	02/15/12 13:22	
EPA 200.7	Manganese	0.714	mg/L	0.0040	0.0011		W206227	AS	02/15/12 13:22	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W206227	AS	02/15/12 13:22	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W206227	AS	02/15/12 13:22	
EPA 200.7	Potassium	0.87	mg/L	0.50	0.07		W206227	AS	02/15/12 13:22	
EPA 200.7	Silicon	30.6	mg/L	0.08	0.03		W206227	AS	02/15/12 13:22	
EPA 200.7	Sodium	20.9	mg/L	0.50	0.04		W206227	AS	02/15/12 13:22	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W206227	AS	02/15/12 13:22	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W206227	AS	02/15/12 13:22	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0021		W206227	AS	02/15/12 13:22	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W206208	KWH	02/20/12 11:13	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W206208	KWH	02/20/12 11:13	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000077		W206208	KWH	02/20/12 13:39	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.000013		W206208	KWH	02/20/12 11:13	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.000072		W206208	KWH	02/20/12 11:13	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000013		W206208	KWH	02/20/12 11:13	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W206208	KWH	02/20/12 11:13	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.0000074		W206208	KWH	02/20/12 11:13	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000033		W206208	KWH	02/20/12 11:13	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000049		W206208	KWH	02/20/12 11:13	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W206190	DJA	02/13/12 10:31	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0005		W206262	IIT	02/10/12 17:22	H3
EPA 120.1	Specific conductance	370	µmhos/cm	5.00			W206216	JMS	02/10/12 08:22	
EPA 180.1	Turbidity	6.39	NTU	0.100			W206197	SM	02/09/12 12:18	H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W206213	IIT	02/10/12 12:47	H3
EPA 350.1	Ammonia as N	0.048	mg/L	0.030	0.006		W207052	RHW	02/14/12 07:17	
EPA 353.2	Nitrate/Nitrite as N	0.596	mg/L	0.050	0.015		W207019	RHW	02/15/12 13:02	
SM 2320B/2310B	Bicarbonate	200	mg/L	1.0	0.5		W206198	DKS	02/09/12 12:38	H3
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.5		W206198	DKS	02/09/12 12:38	H3
SM 2320B/2310B	Total Alkalinity	200	mg/L	1.0	0.5		W206198	DKS	02/09/12 12:38	H3
SM 2540 C	Total Diss. Solids	222	mg/L	20			W206218	JMS	02/10/12 12:25	H3
SM 2540 D	Total Susp. Solids	< 10.0	mg/L	10.0			W206217	JMS	02/10/12 12:25	H3
SM 4500 H B	pH @23.0°C	7.25	pH Units				W206198	DKS	02/09/12 12:38	H3,H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W206212	IIT	02/10/12 12:13	H3
SM 4500-P-E	Phosphorus	0.140	mg/L	0.010	0.004		W207041	SM	02/16/12 15:48	



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Kellogg ID 83837-0929

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Fax (208) 783-0891

Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace Ste 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: **W2B0100**

Reported: 23-Feb-12 10:43

Client Sample ID: **MA-PZ-1-TW**

SVL Sample ID: **W2B0100-03 (Ground Water)**

Sample Report Page 3 of 3

Sampled: 25-Jan-12 15:50

Received: 06-Feb-12

Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	5.67	mg/L	0.20	0.07		W207035	AEW	02/13/12 20:09	
EPA 300.0	Fluoride	0.17	mg/L	0.10	0.02		W207035	AEW	02/13/12 20:09	
EPA 300.0	Sulfate as SO4	0.71	mg/L	0.30	0.04		W207035	AEW	02/13/12 20:09	

Cation/Anion Balance and TDS Ratios

Cation Sum: 3.93 meq/L Anion Sum: 4.22 meq/L C/A Balance: -3.64 % Calculated TDS: 282 TDS/cTDS: 0.79 TDS/eC: 0.60

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace Ste 201
Boise, ID 83707

Project Name: **Suriname Merian 2012 / 113-93245**

Work Order: **W2B0100**

Reported: 23-Feb-12 10:43

Client Sample ID: **TSF-TW-5**

SVL Sample ID: **W2B0100-04 (Ground Water)**

Sample Report Page 1 of 3

Sampled: 24-Jan-12 16:35

Received: 06-Feb-12

Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W206189	DJA	02/13/12 10:33	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	0.780	mg/L	0.080	0.008		W206246	TJK	02/13/12 13:40	
EPA 200.7	Barium	0.0151	mg/L	0.0020	0.0002		W206246	TJK	02/13/12 13:40	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W206246	TJK	02/13/12 13:40	
EPA 200.7	Calcium	4.81	mg/L	0.040	0.006		W206246	TJK	02/13/12 13:40	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0003		W206246	TJK	02/13/12 13:40	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W206246	TJK	02/13/12 13:40	
EPA 200.7	Iron	1.33	mg/L	0.060	0.008		W206246	TJK	02/13/12 13:40	
EPA 200.7	Magnesium	6.70	mg/L	0.060	0.010		W206246	TJK	02/13/12 13:40	
EPA 200.7	Manganese	0.178	mg/L	0.0040	0.0006		W206246	TJK	02/13/12 13:40	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.0006		W206246	TJK	02/13/12 13:40	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W206246	TJK	02/13/12 13:40	
EPA 200.7	Potassium	1.08	mg/L	0.50	0.03		W206246	TJK	02/13/12 13:40	
EPA 200.7	Silicon	23.3	mg/L	0.08	0.01		W206246	TJK	02/13/12 13:40	
EPA 200.7	Sodium	25.1	mg/L	0.50	0.02		W206246	TJK	02/13/12 13:40	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0002		W206246	TJK	02/13/12 13:40	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0002		W206246	TJK	02/13/12 13:40	
EPA 200.7	Zinc	0.0229	mg/L	0.0100	0.0010		W206246	TJK	02/13/12 13:40	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W206207	KWH	02/20/12 11:53	
EPA 200.8	Arsenic	0.0031	mg/L	0.0030	0.0003	2.5	W206207	KWH	02/20/12 11:53	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000096	2.5	W206207	KWH	02/20/12 14:11	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.00002	2.5	W206207	KWH	02/20/12 11:53	
EPA 200.8	Copper	0.00119	mg/L	0.00100	0.00009	2.5	W206207	KWH	02/20/12 11:53	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000016	2.5	W206207	KWH	02/20/12 11:53	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W206207	KWH	02/20/12 11:53	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.000009	2.5	W206207	KWH	02/20/12 11:53	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000004	2.5	W206207	KWH	02/20/12 11:53	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000006	2.5	W206207	KWH	02/20/12 11:53	
SM 2340B	Hardness (as CaCO3)	37.0	mg/L	0.347	0.116		N/A		02/15/12 13:27	



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace Ste 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: W2B0100

Reported: 23-Feb-12 10:43

Client Sample ID: TSF-TW-5

Sampled: 24-Jan-12 16:35

SVL Sample ID: W2B0100-04 (Ground Water)

Received: 06-Feb-12

Sample Report Page 2 of 3

Sampled By:

Table header with columns: Method, Analyte, Result, Units, RL, MDL, Dilution, Batch, Analyst, Analyzed, Notes

Metals (Dissolved)

Main data table listing various metals (Aluminum, Barium, Boron, Calcium, Chromium, Cobalt, Iron, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Silicon, Sodium, Titanium, Vanadium, Zinc, Antimony, Arsenic, Beryllium, Cadmium, Copper, Lead, Selenium, Silver, Thallium, Uranium, Mercury) with their respective results and units.

Classical Chemistry Parameters

Table listing classical chemistry parameters such as Cyanide (free), Specific conductance, Turbidity, Ammonia as N, Nitrate/Nitrite as N, Bicarbonate, Carbonate, Total Alkalinity, Total Diss. Solids, Total Susp. Solids, pH @24.0°C, and Phosphorus.



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Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace Ste 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: **W2B0100**

Reported: 23-Feb-12 10:43

Client Sample ID: **TSF-TW-5**

SVL Sample ID: **W2B0100-04 (Ground Water)**

Sample Report Page 3 of 3

Sampled: 24-Jan-12 16:35

Received: 06-Feb-12

Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	5.47	mg/L	0.20	0.07		W207035	AEW	02/13/12 20:31	
EPA 300.0	Fluoride	0.15	mg/L	0.10	0.02		W207035	AEW	02/13/12 20:31	
EPA 300.0	Sulfate as SO4	11.5	mg/L	0.30	0.04		W207035	AEW	02/13/12 20:31	

Cation/Anion Balance and TDS Ratios

Cation Sum: 1.86 meq/L Anion Sum: 1.93 meq/L C/A Balance: -1.72 % Calculated TDS: 162 TDS/cTDS: 0.79 TDS/eC: 0.71

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace Ste 201
Boise, ID 83707

Project Name: **Suriname Merian 2012 / 113-93245**

Work Order: **W2B0100**

Reported: 23-Feb-12 10:43

Client Sample ID: **TSF-TW-3**

SVL Sample ID: **W2B0100-05 (Ground Water)**

Sample Report Page 1 of 3

Sampled: 24-Jan-12 11:55

Received: 06-Feb-12

Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W206189	DJA	02/13/12 10:35	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	13.6	mg/L	0.080	0.008		W206246	TJK	02/13/12 13:46	
EPA 200.7	Barium	0.0607	mg/L	0.0020	0.0002		W206246	TJK	02/13/12 13:46	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W206246	TJK	02/13/12 13:46	
EPA 200.7	Calcium	8.40	mg/L	0.040	0.006		W206246	TJK	02/13/12 13:46	
EPA 200.7	Chromium	0.0085	mg/L	0.0060	0.0003		W206246	TJK	02/13/12 13:46	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W206246	TJK	02/13/12 13:46	
EPA 200.7	Iron	5.17	mg/L	0.060	0.008		W206246	TJK	02/13/12 13:46	
EPA 200.7	Magnesium	2.87	mg/L	0.060	0.010		W206246	TJK	02/13/12 13:46	
EPA 200.7	Manganese	0.105	mg/L	0.0040	0.0006		W206246	TJK	02/13/12 13:46	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.0006		W206246	TJK	02/13/12 13:46	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W206246	TJK	02/13/12 13:46	
EPA 200.7	Potassium	2.55	mg/L	0.50	0.03		W206246	TJK	02/13/12 13:46	
EPA 200.7	Silicon	34.3	mg/L	0.08	0.01		W206246	TJK	02/13/12 13:46	
EPA 200.7	Sodium	19.0	mg/L	0.50	0.02		W206246	TJK	02/13/12 13:46	
EPA 200.7	Titanium	0.0196	mg/L	0.0050	0.0002		W206246	TJK	02/13/12 13:46	
EPA 200.7	Vanadium	0.0090	mg/L	0.0050	0.0002		W206246	TJK	02/13/12 13:46	
EPA 200.7	Zinc	0.340	mg/L	0.0100	0.0010		W206246	TJK	02/13/12 13:46	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W206207	KWH	02/20/12 11:55	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W206207	KWH	02/20/12 11:55	
EPA 200.8	Beryllium	0.00210	mg/L	0.000200	0.000096	2.5	W206207	KWH	02/20/12 14:13	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.00002	2.5	W206207	KWH	02/20/12 11:55	
EPA 200.8	Copper	0.00743	mg/L	0.00100	0.00009	2.5	W206207	KWH	02/20/12 11:55	
EPA 200.8	Lead	0.0107	mg/L	0.00300	0.000016	2.5	W206207	KWH	02/20/12 11:55	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W206207	KWH	02/20/12 11:55	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.000009	2.5	W206207	KWH	02/20/12 11:55	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000004	2.5	W206207	KWH	02/20/12 11:55	
EPA 200.8	Uranium	0.00330	mg/L	0.00100	0.000006	2.5	W206207	KWH	02/20/12 11:55	
SM 2340B	Hardness (as CaCO3)	4.42	mg/L	0.347	0.116		N/A		02/15/12 13:32	



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace Ste 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2B0100**
Reported: 23-Feb-12 10:43

Client Sample ID: **TSF-TW-3**

SVL Sample ID: **W2B0100-05 (Ground Water)**

Sample Report Page 2 of 3

Sampled: 24-Jan-12 11:55
Received: 06-Feb-12
Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	0.153	mg/L	0.080	0.016		W206227	AS	02/15/12 13:32	
EPA 200.7	Barium	0.0075	mg/L	0.0020	0.0004		W206227	AS	02/15/12 13:32	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W206227	AS	02/15/12 13:32	
EPA 200.7	Calcium	1.47	mg/L	0.040	0.012		W206227	AS	02/15/12 13:32	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W206227	AS	02/15/12 13:32	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W206227	AS	02/15/12 13:32	
EPA 200.7	Iron	0.080	mg/L	0.060	0.017		W206227	AS	02/15/12 13:32	
EPA 200.7	Magnesium	0.184	mg/L	0.060	0.021		W206227	AS	02/15/12 13:32	
EPA 200.7	Manganese	0.0224	mg/L	0.0040	0.0011		W206227	AS	02/15/12 13:32	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W206227	AS	02/15/12 13:32	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W206227	AS	02/15/12 13:32	
EPA 200.7	Potassium	1.34	mg/L	0.50	0.07		W206227	AS	02/15/12 13:32	
EPA 200.7	Silicon	6.03	mg/L	0.08	0.03		W206227	AS	02/15/12 13:32	
EPA 200.7	Sodium	18.2	mg/L	0.50	0.04		W206227	AS	02/15/12 13:32	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W206227	AS	02/15/12 13:32	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W206227	AS	02/15/12 13:32	
EPA 200.7	Zinc	0.0536	mg/L	0.0100	0.0021		W206227	AS	02/15/12 13:32	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W206208	KWH	02/20/12 11:17	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W206208	KWH	02/20/12 11:17	
EPA 200.8	Beryllium	0.000206	mg/L	0.000200	0.000077		W206208	KWH	02/20/12 13:43	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.000013		W206208	KWH	02/20/12 11:17	
EPA 200.8	Copper	0.00121	mg/L	0.00100	0.000072		W206208	KWH	02/20/12 11:17	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000013		W206208	KWH	02/20/12 11:17	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W206208	KWH	02/20/12 11:17	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.0000074		W206208	KWH	02/20/12 11:17	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000033		W206208	KWH	02/20/12 11:17	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000049		W206208	KWH	02/20/12 11:17	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W206190	DJA	02/13/12 10:35	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0005		W206262	IIT	02/10/12 17:11	H3
EPA 120.1	Specific conductance	95.9	µmhos/cm	5.00			W206216	JMS	02/10/12 08:22	
EPA 180.1	Turbidity	256	NTU	1.00		10	W206197	SM	02/09/12 12:18	D2,H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W206213	IIT	02/10/12 12:51	H3
EPA 350.1	Ammonia as N	0.147	mg/L	0.030	0.006		W207052	RHW	02/14/12 07:25	
EPA 353.2	Nitrate/Nitrite as N	1.15	mg/L	0.050	0.015		W207019	RHW	02/15/12 12:40	
SM 2320B/2310B	Bicarbonate	32.7	mg/L	1.0	0.5		W206198	DKS	02/09/12 13:29	H3
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.5		W206198	DKS	02/09/12 13:29	H3
SM 2320B/2310B	Total Alkalinity	32.7	mg/L	1.0	0.5		W206198	DKS	02/09/12 13:29	H3
SM 2540 C	Total Diss. Solids	60	mg/L	40			W206218	JMS	02/10/12 12:25	H3
SM 2540 D	Total Susp. Solids	728	mg/L	20.0			W206217	JMS	02/10/12 12:25	H3
SM 4500 H B	pH @23.0°C	6.45	pH Units				W206198	DKS	02/09/12 13:29	H3,H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W206212	IIT	02/10/12 12:17	H3
SM 4500-P-E	Phosphorus	0.028	mg/L	0.010	0.004		W207041	SM	02/16/12 15:48	



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Kellogg ID 83837-0929

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Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace Ste 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: **W2B0100**

Reported: 23-Feb-12 10:43

Client Sample ID: **TSF-TW-3**

SVL Sample ID: **W2B0100-05 (Ground Water)**

Sample Report Page 3 of 3

Sampled: 24-Jan-12 11:55

Received: 06-Feb-12

Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	5.51	mg/L	0.20	0.07		W207035	AEW	02/13/12 20:42	
EPA 300.0	Fluoride	0.16	mg/L	0.10	0.02		W207035	AEW	02/13/12 20:42	
EPA 300.0	Sulfate as SO4	6.17	mg/L	0.30	0.04		W207035	AEW	02/13/12 20:42	

Cation/Anion Balance and TDS Ratios

Cation Sum: 0.95 meq/L Anion Sum: 1.03 meq/L C/A Balance: -4.07 % Calculated TDS: 118 TDS/cTDS: 0.51 TDS/eC: 0.63

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Tetra Tech EM, Inc. (Boise)
 3380 Americana Terrace Ste 201
 Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: **W2B0100**

Reported: 23-Feb-12 10:43

Client Sample ID: **TSF-PZ-7**

SVL Sample ID: **W2B0100-06 (Ground Water)**

Sample Report Page 1 of 3

Sampled: 25-Jan-12 11:10

Received: 06-Feb-12

Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W206189	DJA	02/13/12 10:36	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	0.301	mg/L	0.080	0.008		W206246	TJK	02/13/12 13:52	
EPA 200.7	Barium	0.0256	mg/L	0.0020	0.0002		W206246	TJK	02/13/12 13:52	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W206246	TJK	02/13/12 13:52	
EPA 200.7	Calcium	14.7	mg/L	0.040	0.006		W206246	TJK	02/13/12 13:52	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0003		W206246	TJK	02/13/12 13:52	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W206246	TJK	02/13/12 13:52	
EPA 200.7	Iron	1.16	mg/L	0.060	0.008		W206246	TJK	02/13/12 13:52	
EPA 200.7	Magnesium	8.08	mg/L	0.060	0.010		W206246	TJK	02/13/12 13:52	
EPA 200.7	Manganese	0.522	mg/L	0.0040	0.0006		W206246	TJK	02/13/12 13:52	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.0006		W206246	TJK	02/13/12 13:52	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W206246	TJK	02/13/12 13:52	
EPA 200.7	Potassium	0.73	mg/L	0.50	0.03		W206246	TJK	02/13/12 13:52	
EPA 200.7	Silicon	35.2	mg/L	0.08	0.01		W206246	TJK	02/13/12 13:52	
EPA 200.7	Sodium	20.6	mg/L	0.50	0.02		W206246	TJK	02/13/12 13:52	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0002		W206246	TJK	02/13/12 13:52	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0002		W206246	TJK	02/13/12 13:52	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0010		W206246	TJK	02/13/12 13:52	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W206207	KWH	02/20/12 12:01	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W206207	KWH	02/20/12 12:01	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000096	2.5	W206207	KWH	02/20/12 14:17	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.00002	2.5	W206207	KWH	02/20/12 12:01	
EPA 200.8	Copper	0.00744	mg/L	0.00100	0.00009	2.5	W206207	KWH	02/20/12 12:01	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000016	2.5	W206207	KWH	02/20/12 12:01	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W206207	KWH	02/20/12 12:01	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.000009	2.5	W206207	KWH	02/20/12 12:01	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000004	2.5	W206207	KWH	02/20/12 12:01	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000006	2.5	W206207	KWH	02/20/12 12:01	
SM 2340B	Hardness (as CaCO3)	72.2	mg/L	0.347	0.116		N/A		02/15/12 13:38	



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace Ste 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: **W2B0100**

Reported: 23-Feb-12 10:43

Client Sample ID: **TSF-PZ-7**

SVL Sample ID: **W2B0100-06 (Ground Water)**

Sample Report Page 2 of 3

Sampled: 25-Jan-12 11:10

Received: 06-Feb-12

Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.016		W206227	AS	02/15/12 13:38	
EPA 200.7	Barium	0.0261	mg/L	0.0020	0.0004		W206227	AS	02/15/12 13:38	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W206227	AS	02/15/12 13:38	
EPA 200.7	Calcium	15.1	mg/L	0.040	0.012		W206227	AS	02/15/12 13:38	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W206227	AS	02/15/12 13:38	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W206227	AS	02/15/12 13:38	
EPA 200.7	Iron	1.18	mg/L	0.060	0.017		W206227	AS	02/15/12 13:38	
EPA 200.7	Magnesium	8.41	mg/L	0.060	0.021		W206227	AS	02/15/12 13:38	
EPA 200.7	Manganese	0.563	mg/L	0.0040	0.0011		W206227	AS	02/15/12 13:38	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W206227	AS	02/15/12 13:38	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W206227	AS	02/15/12 13:38	
EPA 200.7	Potassium	0.77	mg/L	0.50	0.07		W206227	AS	02/15/12 13:38	
EPA 200.7	Silicon	35.9	mg/L	0.08	0.03		W206227	AS	02/15/12 13:38	
EPA 200.7	Sodium	20.5	mg/L	0.50	0.04		W206227	AS	02/15/12 13:38	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W206227	AS	02/15/12 13:38	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W206227	AS	02/15/12 13:38	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0021		W206227	AS	02/15/12 13:38	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W206208	KWH	02/20/12 11:19	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W206208	KWH	02/20/12 11:19	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000077		W206208	KWH	02/20/12 13:44	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.000013		W206208	KWH	02/20/12 11:19	
EPA 200.8	Copper	0.00232	mg/L	0.00100	0.000072		W206208	KWH	02/20/12 11:19	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000013		W206208	KWH	02/20/12 11:19	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W206208	KWH	02/20/12 11:19	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.0000074		W206208	KWH	02/20/12 11:19	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000033		W206208	KWH	02/20/12 11:19	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000049		W206208	KWH	02/20/12 11:19	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W206190	DJA	02/13/12 10:36	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0005		W206262	IIT	02/10/12 17:24	H3
EPA 120.1	Specific conductance	230	µmhos/cm	5.00			W206216	JMS	02/10/12 08:22	
EPA 180.1	Turbidity	3.26	NTU	0.100			W206197	SM	02/09/12 12:18	H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W206213	IIT	02/10/12 12:53	H3
EPA 350.1	Ammonia as N	0.063	mg/L	0.030	0.006		W207052	RHW	02/14/12 07:27	
EPA 353.2	Nitrate/Nitrite as N	0.121	mg/L	0.050	0.015		W207019	RHW	02/15/12 12:41	
SM 2320B/2310B	Bicarbonate	108	mg/L	1.0	0.5		W206198	DKS	02/09/12 13:34	H3
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.5		W206198	DKS	02/09/12 13:34	H3
SM 2320B/2310B	Total Alkalinity	108	mg/L	1.0	0.5		W206198	DKS	02/09/12 13:34	H3
SM 2540 C	Total Diss. Solids	132	mg/L	20			W206218	JMS	02/10/12 12:25	H3
SM 2540 D	Total Susp. Solids	12.0	mg/L	10.0			W206217	JMS	02/10/12 12:25	H3
SM 4500 H B	pH @23.0°C	7.11	pH Units				W206198	DKS	02/09/12 13:34	H3,H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W206212	IIT	02/10/12 12:19	H3
SM 4500-P-E	Phosphorus	0.423	mg/L	0.010	0.004		W207041	SM	02/16/12 15:48	



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

(208) 784-1258

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Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace Ste 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: **W2B0100**

Reported: 23-Feb-12 10:43

Client Sample ID: **TSF-PZ-7**

SVL Sample ID: **W2B0100-06 (Ground Water)**

Sample Report Page 3 of 3

Sampled: 25-Jan-12 11:10

Received: 06-Feb-12

Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	10.0	mg/L	0.20	0.07		W207035	AEW	02/13/12 21:15	
EPA 300.0	Fluoride	0.19	mg/L	0.10	0.02		W207035	AEW	02/13/12 21:15	
EPA 300.0	Sulfate as SO4	2.10	mg/L	0.30	0.04		W207035	AEW	02/13/12 21:15	

Cation/Anion Balance and TDS Ratios

Cation Sum: 2.38 meq/L Anion Sum: 2.50 meq/L C/A Balance: -2.59 % Calculated TDS: 218 TDS/cTDS: 0.60 TDS/eC: 0.57

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace Ste 201
Boise, ID 83707

Project Name: **Suriname Merian 2012 / 113-93245**

Work Order: **W2B0100**

Reported: 23-Feb-12 10:43

Client Sample ID: **MA-TW-6**

SVL Sample ID: **W2B0100-07 (Ground Water)**

Sample Report Page 1 of 3

Sampled: 26-Jan-12 16:50

Received: 06-Feb-12

Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W206189	DJA	02/13/12 10:38	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	0.696	mg/L	0.080	0.008		W206246	TJK	02/13/12 13:59	
EPA 200.7	Barium	0.0243	mg/L	0.0020	0.0002		W206246	TJK	02/13/12 13:59	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W206246	TJK	02/13/12 13:59	
EPA 200.7	Calcium	29.4	mg/L	0.040	0.006		W206246	TJK	02/13/12 13:59	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0003		W206246	TJK	02/13/12 13:59	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W206246	TJK	02/13/12 13:59	
EPA 200.7	Iron	0.662	mg/L	0.060	0.008		W206246	TJK	02/13/12 13:59	
EPA 200.7	Magnesium	12.1	mg/L	0.060	0.010		W206246	TJK	02/13/12 13:59	
EPA 200.7	Manganese	0.562	mg/L	0.0040	0.0006		W206246	TJK	02/13/12 13:59	
EPA 200.7	Molybdenum	0.018	mg/L	0.008	0.0006		W206246	TJK	02/13/12 13:59	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W206246	TJK	02/13/12 13:59	
EPA 200.7	Potassium	4.10	mg/L	0.50	0.03		W206246	TJK	02/13/12 13:59	
EPA 200.7	Silicon	18.1	mg/L	0.08	0.01		W206246	TJK	02/13/12 13:59	
EPA 200.7	Sodium	47.1	mg/L	0.50	0.02		W206246	TJK	02/13/12 13:59	
EPA 200.7	Titanium	0.0088	mg/L	0.0050	0.0002		W206246	TJK	02/13/12 13:59	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0002		W206246	TJK	02/13/12 13:59	
EPA 200.7	Zinc	0.0600	mg/L	0.0100	0.0010		W206246	TJK	02/13/12 13:59	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W206207	KWH	02/20/12 12:02	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W206207	KWH	02/20/12 12:02	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000096	2.5	W206207	KWH	02/20/12 14:19	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.00002	2.5	W206207	KWH	02/20/12 12:02	
EPA 200.8	Copper	0.00461	mg/L	0.00100	0.00009	2.5	W206207	KWH	02/20/12 12:02	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000016	2.5	W206207	KWH	02/20/12 12:02	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W206207	KWH	02/20/12 12:02	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.000009	2.5	W206207	KWH	02/20/12 12:02	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000004	2.5	W206207	KWH	02/20/12 12:02	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000006	2.5	W206207	KWH	02/20/12 12:02	
SM 2340B	Hardness (as CaCO3)	123	mg/L	0.347	0.116		N/A		02/15/12 13:43	



Tetra Tech EM, Inc. (Boise)
 3380 Americana Terrace Ste 201
 Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: **W2B0100**

Reported: 23-Feb-12 10:43

Client Sample ID: **MA-TW-6**

Sampled: 26-Jan-12 16:50

SVL Sample ID: **W2B0100-07 (Ground Water)**

Received: 06-Feb-12

Sample Report Page 2 of 3

Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Dissolved)

EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.016		W206227	AS	02/15/12 13:43	
EPA 200.7	Barium	0.0226	mg/L	0.0020	0.0004		W206227	AS	02/15/12 13:43	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W206227	AS	02/15/12 13:43	
EPA 200.7	Calcium	29.5	mg/L	0.040	0.012		W206227	AS	02/15/12 13:43	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W206227	AS	02/15/12 13:43	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W206227	AS	02/15/12 13:43	
EPA 200.7	Iron	0.369	mg/L	0.060	0.017		W206227	AS	02/15/12 13:43	
EPA 200.7	Magnesium	12.1	mg/L	0.060	0.021		W206227	AS	02/15/12 13:43	
EPA 200.7	Manganese	0.622	mg/L	0.0040	0.0011		W206227	AS	02/15/12 13:43	
EPA 200.7	Molybdenum	0.015	mg/L	0.008	0.001		W206227	AS	02/15/12 13:43	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W206227	AS	02/15/12 13:43	
EPA 200.7	Potassium	4.06	mg/L	0.50	0.07		W206227	AS	02/15/12 13:43	
EPA 200.7	Silicon	16.5	mg/L	0.08	0.03		W206227	AS	02/15/12 13:43	
EPA 200.7	Sodium	45.9	mg/L	0.50	0.04		W206227	AS	02/15/12 13:43	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W206227	AS	02/15/12 13:43	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W206227	AS	02/15/12 13:43	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0021		W206227	AS	02/15/12 13:43	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W206208	KWH	02/20/12 11:24	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W206208	KWH	02/20/12 11:24	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000077		W206208	KWH	02/20/12 13:49	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.000013		W206208	KWH	02/20/12 11:24	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.000072		W206208	KWH	02/20/12 11:24	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000013		W206208	KWH	02/20/12 11:24	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W206208	KWH	02/20/12 11:24	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.0000074		W206208	KWH	02/20/12 11:24	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000033		W206208	KWH	02/20/12 11:24	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000049		W206208	KWH	02/20/12 11:24	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W206190	DJA	02/13/12 10:38	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0005		W206262	IIT	02/10/12 17:43	H1
EPA 120.1	Specific conductance	449	µmhos/cm	5.00			W206216	JMS	02/10/12 08:22	
EPA 180.1	Turbidity	9.01	NTU	0.100			W206197	SM	02/09/12 12:18	H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W206213	IIT	02/10/12 13:01	H1
EPA 350.1	Ammonia as N	0.539	mg/L	0.030	0.006		W207052	RHW	02/14/12 07:28	
EPA 353.2	Nitrate/Nitrite as N	0.121	mg/L	0.050	0.015		W207019	RHW	02/15/12 12:42	
SM 2320B/2310B	Bicarbonate	205	mg/L	1.0	0.5		W206198	DKS	02/09/12 13:43	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.5		W206198	DKS	02/09/12 13:43	
SM 2320B/2310B	Total Alkalinity	205	mg/L	1.0	0.5		W206198	DKS	02/09/12 13:43	
SM 2540 C	Total Diss. Solids	226	mg/L	20			W206218	JMS	02/10/12 12:25	H3
SM 2540 D	Total Susp. Solids	28.0	mg/L	10.0			W206217	JMS	02/10/12 12:25	H3
SM 4500 H B	pH @23.0°C	7.72	pH Units				W206198	DKS	02/09/12 13:43	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W206212	IIT	02/10/12 12:21	H1
SM 4500-P-E	Phosphorus	0.044	mg/L	0.010	0.004		W207041	SM	02/16/12 15:48	



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Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace Ste 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: **W2B0100**

Reported: 23-Feb-12 10:43

Client Sample ID: **MA-TW-6**

SVL Sample ID: **W2B0100-07 (Ground Water)**

Sample Report Page 3 of 3

Sampled: 26-Jan-12 16:50

Received: 06-Feb-12

Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	11.6	mg/L	1.00	0.36	5	W207035	AEW	02/13/12 21:47	D2
EPA 300.0	Fluoride	0.20	mg/L	0.10	0.02		W207035	AEW	02/13/12 21:36	
EPA 300.0	Sulfate as SO4	17.8	mg/L	0.30	0.04		W207035	AEW	02/13/12 21:36	

Cation/Anion Balance and TDS Ratios

Cation Sum: 4.64 meq/L Anion Sum: 4.81 meq/L C/A Balance: -1.86 % Calculated TDS: 292 TDS/cTDS: 0.77 TDS/eC: 0.50

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace Ste 201
Boise, ID 83707

Project Name: **Suriname Merian 2012 / 113-93245**

Work Order: **W2B0100**

Reported: 23-Feb-12 10:43

Client Sample ID: **TSF-MW-1**

SVL Sample ID: **W2B0100-08 (Ground Water)**

Sample Report Page 1 of 3

Sampled: 23-Jan-12 17:10

Received: 06-Feb-12

Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W206189	DJA	02/13/12 10:40	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.008		W206246	TJK	02/13/12 14:05	
EPA 200.7	Barium	0.0654	mg/L	0.0020	0.0002		W206246	TJK	02/13/12 14:05	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W206246	TJK	02/13/12 14:05	
EPA 200.7	Calcium	20.7	mg/L	0.040	0.006		W206246	TJK	02/13/12 14:05	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0003		W206246	TJK	02/13/12 14:05	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W206246	TJK	02/13/12 14:05	
EPA 200.7	Iron	1.30	mg/L	0.060	0.008		W206246	TJK	02/13/12 14:05	
EPA 200.7	Magnesium	7.57	mg/L	0.060	0.010		W206246	TJK	02/13/12 14:05	
EPA 200.7	Manganese	0.765	mg/L	0.0040	0.0006		W206246	TJK	02/13/12 14:05	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.0006		W206246	TJK	02/13/12 14:05	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W206246	TJK	02/13/12 14:05	
EPA 200.7	Potassium	0.55	mg/L	0.50	0.03		W206246	TJK	02/13/12 14:05	
EPA 200.7	Silicon	17.1	mg/L	0.08	0.01		W206246	TJK	02/13/12 14:05	
EPA 200.7	Sodium	22.0	mg/L	0.50	0.02		W206246	TJK	02/13/12 14:05	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0002		W206246	TJK	02/13/12 14:05	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0002		W206246	TJK	02/13/12 14:05	
EPA 200.7	Zinc	0.0148	mg/L	0.0100	0.0010		W206246	TJK	02/13/12 14:05	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W206207	KWH	02/20/12 12:04	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W206207	KWH	02/20/12 12:04	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000096	2.5	W206207	KWH	02/20/12 14:20	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.00002	2.5	W206207	KWH	02/20/12 12:04	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.00009	2.5	W206207	KWH	02/20/12 12:04	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000016	2.5	W206207	KWH	02/20/12 12:04	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W206207	KWH	02/20/12 12:04	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.000009	2.5	W206207	KWH	02/20/12 12:04	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000004	2.5	W206207	KWH	02/20/12 12:04	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000006	2.5	W206207	KWH	02/20/12 12:04	
SM 2340B	Hardness (as CaCO3)	86.0	mg/L	0.347	0.116		N/A		02/15/12 13:48	



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace Ste 201
Boise, ID 83707

Project Name: **Suriname Merian 2012 / 113-93245**
Work Order: **W2B0100**
Reported: 23-Feb-12 10:43

Client Sample ID: **TSF-MW-1**

SVL Sample ID: **W2B0100-08 (Ground Water)**

Sample Report Page 2 of 3

Sampled: 23-Jan-12 17:10
Received: 06-Feb-12
Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.016		W206227	AS	02/15/12 13:48	
EPA 200.7	Barium	0.0699	mg/L	0.0020	0.0004		W206227	AS	02/15/12 13:48	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W206227	AS	02/15/12 13:48	
EPA 200.7	Calcium	21.4	mg/L	0.040	0.012		W206227	AS	02/15/12 13:48	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W206227	AS	02/15/12 13:48	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W206227	AS	02/15/12 13:48	
EPA 200.7	Iron	1.31	mg/L	0.060	0.017		W206227	AS	02/15/12 13:48	
EPA 200.7	Magnesium	7.91	mg/L	0.060	0.021		W206227	AS	02/15/12 13:48	
EPA 200.7	Manganese	0.860	mg/L	0.0040	0.0011		W206227	AS	02/15/12 13:48	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W206227	AS	02/15/12 13:48	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W206227	AS	02/15/12 13:48	
EPA 200.7	Potassium	0.65	mg/L	0.50	0.07		W206227	AS	02/15/12 13:48	
EPA 200.7	Silicon	17.2	mg/L	0.08	0.03		W206227	AS	02/15/12 13:48	
EPA 200.7	Sodium	21.6	mg/L	0.50	0.04		W206227	AS	02/15/12 13:48	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W206227	AS	02/15/12 13:48	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W206227	AS	02/15/12 13:48	
EPA 200.7	Zinc	0.0157	mg/L	0.0100	0.0021		W206227	AS	02/15/12 13:48	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W206208	KWH	02/20/12 11:26	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W206208	KWH	02/20/12 11:26	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000077		W206208	KWH	02/20/12 13:50	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.000013		W206208	KWH	02/20/12 11:26	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.000072		W206208	KWH	02/20/12 11:26	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000013		W206208	KWH	02/20/12 11:26	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W206208	KWH	02/20/12 11:26	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.0000074		W206208	KWH	02/20/12 11:26	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000033		W206208	KWH	02/20/12 11:26	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000049		W206208	KWH	02/20/12 11:26	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W206190	DJA	02/13/12 10:40	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0005		W206262	IIT	02/10/12 17:28	H3
EPA 120.1	Specific conductance	265	µmhos/cm	5.00			W206216	JMS	02/10/12 08:22	
EPA 180.1	Turbidity	6.91	NTU	0.100			W206197	SM	02/09/12 12:18	H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W206213	IIT	02/10/12 13:03	H3
EPA 350.1	Ammonia as N	0.038	mg/L	0.030	0.006		W207052	RHW	02/14/12 07:29	
EPA 353.2	Nitrate/Nitrite as N	< 0.050	mg/L	0.050	0.015		W207019	RHW	02/15/12 12:44	
SM 2320B/2310B	Bicarbonate	134	mg/L	1.0	0.5		W206198	DKS	02/09/12 13:50	H3
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.5		W206198	DKS	02/09/12 13:50	H3
SM 2320B/2310B	Total Alkalinity	134	mg/L	1.0	0.5		W206198	DKS	02/09/12 13:50	H3
SM 2540 C	Total Diss. Solids	114	mg/L	20			W206218	JMS	02/10/12 12:25	H3
SM 2540 D	Total Susp. Solids	< 10.0	mg/L	10.0			W206217	JMS	02/10/12 12:25	H3
SM 4500 H B	pH @23.0°C	7.41	pH Units				W206198	DKS	02/09/12 13:50	H3,H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W206212	IIT	02/10/12 12:23	H3
SM 4500-P-E	Phosphorus	0.038	mg/L	0.010	0.004		W207041	SM	02/16/12 15:48	



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

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Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace Ste 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: **W2B0100**

Reported: 23-Feb-12 10:43

Client Sample ID: **TSF-MW-1**

SVL Sample ID: **W2B0100-08 (Ground Water)**

Sample Report Page 3 of 3

Sampled: 23-Jan-12 17:10

Received: 06-Feb-12

Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	6.44	mg/L	0.20	0.07		W207035	AEW	02/13/12 21:58	
EPA 300.0	Fluoride	0.12	mg/L	0.10	0.02		W207035	AEW	02/13/12 21:58	
EPA 300.0	Sulfate as SO4	0.99	mg/L	0.30	0.04		W207035	AEW	02/13/12 21:58	

Cation/Anion Balance and TDS Ratios

Cation Sum: 2.69 meq/L Anion Sum: 2.89 meq/L C/A Balance: -3.55 % Calculated TDS: 186 TDS/cTDS: 0.61 TDS/eC: 0.43

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace Ste 201
Boise, ID 83707

Project Name: **Suriname Merian 2012 / 113-93245**

Work Order: **W2B0100**

Reported: 23-Feb-12 10:43

Client Sample ID: **DUP-100**

SVL Sample ID: **W2B0100-09 (Ground Water)**

Sample Report Page 1 of 3

Sampled: —

Received: 06-Feb-12

Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W206189	DJA	02/13/12 10:41	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	0.789	mg/L	0.080	0.008		W206246	TJK	02/13/12 14:23	
EPA 200.7	Barium	0.0087	mg/L	0.0020	0.0002		W206246	TJK	02/13/12 14:23	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W206246	TJK	02/13/12 14:23	
EPA 200.7	Calcium	0.484	mg/L	0.040	0.006		W206246	TJK	02/13/12 14:23	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0003		W206246	TJK	02/13/12 14:23	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W206246	TJK	02/13/12 14:23	
EPA 200.7	Iron	0.642	mg/L	0.060	0.008		W206246	TJK	02/13/12 14:23	
EPA 200.7	Magnesium	0.215	mg/L	0.060	0.010		W206246	TJK	02/13/12 14:23	
EPA 200.7	Manganese	0.0497	mg/L	0.0040	0.0006		W206246	TJK	02/13/12 14:23	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.0006		W206246	TJK	02/13/12 14:23	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W206246	TJK	02/13/12 14:23	
EPA 200.7	Potassium	0.92	mg/L	0.50	0.03		W206246	TJK	02/13/12 14:23	
EPA 200.7	Silicon	13.7	mg/L	0.08	0.01		W206246	TJK	02/13/12 14:23	
EPA 200.7	Sodium	16.6	mg/L	0.50	0.02		W206246	TJK	02/13/12 14:23	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0002		W206246	TJK	02/13/12 14:23	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0002		W206246	TJK	02/13/12 14:23	
EPA 200.7	Zinc	0.0885	mg/L	0.0100	0.0010		W206246	TJK	02/13/12 14:23	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W206207	KWH	02/20/12 12:06	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W206207	KWH	02/20/12 12:06	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000096	2.5	W206207	KWH	02/20/12 14:22	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.00002	2.5	W206207	KWH	02/20/12 12:06	
EPA 200.8	Copper	0.00106	mg/L	0.00100	0.00009	2.5	W206207	KWH	02/20/12 12:06	
EPA 200.8	Lead	0.00399	mg/L	0.00300	0.000016	2.5	W206207	KWH	02/20/12 12:06	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W206207	KWH	02/20/12 12:06	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.000009	2.5	W206207	KWH	02/20/12 12:06	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000004	2.5	W206207	KWH	02/20/12 12:06	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000006	2.5	W206207	KWH	02/20/12 12:06	
SM 2340B	Hardness (as CaCO3)	0.877	mg/L	0.347	0.116		N/A		02/15/12 14:10	



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace Ste 201
Boise, ID 83707

Project Name: **Suriname Merian 2012 / 113-93245**

Work Order: **W2B0100**

Reported: 23-Feb-12 10:43

Client Sample ID: **DUP-100**

SVL Sample ID: **W2B0100-09 (Ground Water)**

Sample Report Page 2 of 3

Sampled: —

Received: 06-Feb-12

Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	0.150	mg/L	0.080	0.016		W206227	AS	02/15/12 14:10	
EPA 200.7	Barium	0.0028	mg/L	0.0020	0.0004		W206227	AS	02/15/12 14:10	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W206227	AS	02/15/12 14:10	
EPA 200.7	Calcium	0.238	mg/L	0.040	0.012		W206227	AS	02/15/12 14:10	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W206227	AS	02/15/12 14:10	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W206227	AS	02/15/12 14:10	
EPA 200.7	Iron	0.204	mg/L	0.060	0.017		W206227	AS	02/15/12 14:10	
EPA 200.7	Magnesium	0.069	mg/L	0.060	0.021		W206227	AS	02/15/12 14:10	
EPA 200.7	Manganese	0.0249	mg/L	0.0040	0.0011		W206227	AS	02/15/12 14:10	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W206227	AS	02/15/12 14:10	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W206227	AS	02/15/12 14:10	
EPA 200.7	Potassium	0.96	mg/L	0.50	0.07		W206227	AS	02/15/12 14:10	
EPA 200.7	Silicon	12.8	mg/L	0.08	0.03		W206227	AS	02/15/12 14:10	
EPA 200.7	Sodium	16.4	mg/L	0.50	0.04		W206227	AS	02/15/12 14:10	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W206227	AS	02/15/12 14:10	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W206227	AS	02/15/12 14:10	
EPA 200.7	Zinc	0.0369	mg/L	0.0100	0.0021		W206227	AS	02/15/12 14:10	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W206208	KWH	02/20/12 11:28	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W206208	KWH	02/20/12 11:28	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000077		W206208	KWH	02/20/12 13:52	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.000013		W206208	KWH	02/20/12 11:28	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.000072		W206208	KWH	02/20/12 11:28	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000013		W206208	KWH	02/20/12 11:28	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W206208	KWH	02/20/12 11:28	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.0000074		W206208	KWH	02/20/12 11:28	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000033		W206208	KWH	02/20/12 11:28	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000049		W206208	KWH	02/20/12 11:28	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W206190	DJA	02/13/12 10:41	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0005		W206262	IIT	02/10/12 17:30	
EPA 120.1	Specific conductance	86.6	µmhos/cm	5.00			W206216	JMS	02/10/12 08:22	
EPA 180.1	Turbidity	5.53	NTU	0.100			W206197	SM	02/09/12 12:18	H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W206213	IIT	02/10/12 13:05	
EPA 350.1	Ammonia as N	0.088	mg/L	0.030	0.006		W207052	RHW	02/14/12 07:31	
EPA 353.2	Nitrate/Nitrite as N	0.203	mg/L	0.050	0.015		W207019	RHW	02/15/12 12:51	
SM 2320B/2310B	Bicarbonate	24.8	mg/L	1.0	0.5		W206198	DKS	02/09/12 13:56	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.5		W206198	DKS	02/09/12 13:56	
SM 2320B/2310B	Total Alkalinity	24.8	mg/L	1.0	0.5		W206198	DKS	02/09/12 13:56	
SM 2540 C	Total Diss. Solids	40	mg/L	20			W206218	JMS	02/10/12 12:25	
SM 2540 D	Total Susp. Solids	16.0	mg/L	10.0			W206217	JMS	02/10/12 12:25	
SM 4500 H B	pH @23.0°C	6.04	pH Units				W206198	DKS	02/09/12 13:56	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W206212	IIT	02/10/12 12:25	
SM 4500-P-E	Phosphorus	0.024	mg/L	0.010	0.004		W207041	SM	02/16/12 15:48	



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Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace Ste 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: **W2B0100**

Reported: 23-Feb-12 10:43

Client Sample ID: **DUP-100**

SVL Sample ID: **W2B0100-09 (Ground Water)**

Sample Report Page 3 of 3

Sampled: —

Received: 06-Feb-12

Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	4.01	mg/L	0.20	0.07		W207035	AEW	02/13/12 22:20	
EPA 300.0	Fluoride	< 0.10	mg/L	0.10	0.02		W207035	AEW	02/13/12 22:20	
EPA 300.0	Sulfate as SO4	10.5	mg/L	0.30	0.04		W207035	AEW	02/13/12 22:20	

Cation/Anion Balance and TDS Ratios

Cation Sum: 0.79 meq/L Anion Sum: 0.84 meq/L C/A Balance: -3.45 % Calculated TDS: 84 TDS/cTDS: 0.48 TDS/eC: 0.46

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace Ste 201
Boise, ID 83707

Project Name: **Suriname Merian 2012 / 113-93245**

Work Order: **W2B0100**

Reported: 23-Feb-12 10:43

Client Sample ID: **M2-PZ-1-TW**

SVL Sample ID: **W2B0100-10 (Ground Water)**

Sample Report Page 1 of 3

Sampled: 26-Jan-12 11:50

Received: 06-Feb-12

Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W206189	DJA	02/13/12 10:43	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	0.242	mg/L	0.080	0.008		W206246	TJK	02/13/12 14:29	
EPA 200.7	Barium	0.130	mg/L	0.0020	0.0002		W206246	TJK	02/13/12 14:29	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W206246	TJK	02/13/12 14:29	
EPA 200.7	Calcium	34.0	mg/L	0.040	0.006		W206246	TJK	02/13/12 14:29	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0003		W206246	TJK	02/13/12 14:29	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W206246	TJK	02/13/12 14:29	
EPA 200.7	Iron	1.01	mg/L	0.060	0.008		W206246	TJK	02/13/12 14:29	
EPA 200.7	Magnesium	15.7	mg/L	0.060	0.010		W206246	TJK	02/13/12 14:29	
EPA 200.7	Manganese	1.04	mg/L	0.0040	0.0006		W206246	TJK	02/13/12 14:29	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.0006		W206246	TJK	02/13/12 14:29	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W206246	TJK	02/13/12 14:29	
EPA 200.7	Potassium	0.91	mg/L	0.50	0.03		W206246	TJK	02/13/12 14:29	
EPA 200.7	Silicon	20.0	mg/L	0.08	0.01		W206246	TJK	02/13/12 14:29	
EPA 200.7	Sodium	21.4	mg/L	0.50	0.02		W206246	TJK	02/13/12 14:29	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0002		W206246	TJK	02/13/12 14:29	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0002		W206246	TJK	02/13/12 14:29	
EPA 200.7	Zinc	0.0513	mg/L	0.0100	0.0010		W206246	TJK	02/13/12 14:29	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W206207	KWH	02/20/12 12:08	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W206207	KWH	02/20/12 12:08	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000096	2.5	W206207	KWH	02/20/12 14:23	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.00002	2.5	W206207	KWH	02/20/12 12:08	
EPA 200.8	Copper	0.00134	mg/L	0.00100	0.00009	2.5	W206207	KWH	02/20/12 12:08	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000016	2.5	W206207	KWH	02/20/12 12:08	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W206207	KWH	02/20/12 12:08	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.000009	2.5	W206207	KWH	02/20/12 12:08	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000004	2.5	W206207	KWH	02/20/12 12:08	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000006	2.5	W206207	KWH	02/20/12 12:08	
SM 2340B	Hardness (as CaCO3)	167	mg/L	0.347	0.116		N/A		02/15/12 14:16	



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace Ste 201
Boise, ID 83707

Project Name: **Suriname Merian 2012 / 113-93245**

Work Order: **W2B0100**

Reported: 23-Feb-12 10:43

Client Sample ID: **M2-PZ-1-TW**

SVL Sample ID: **W2B0100-10 (Ground Water)**

Sample Report Page 2 of 3

Sampled: 26-Jan-12 11:50

Received: 06-Feb-12

Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Dissolved)

EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.016		W206227	AS	02/15/12 14:16	
EPA 200.7	Barium	0.153	mg/L	0.0020	0.0004		W206227	AS	02/15/12 14:16	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W206227	AS	02/15/12 14:16	
EPA 200.7	Calcium	38.6	mg/L	0.040	0.012		W206227	AS	02/15/12 14:16	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W206227	AS	02/15/12 14:16	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W206227	AS	02/15/12 14:16	
EPA 200.7	Iron	0.698	mg/L	0.060	0.017		W206227	AS	02/15/12 14:16	
EPA 200.7	Magnesium	17.2	mg/L	0.060	0.021		W206227	AS	02/15/12 14:16	
EPA 200.7	Manganese	1.13	mg/L	0.0040	0.0011		W206227	AS	02/15/12 14:16	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W206227	AS	02/15/12 14:16	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W206227	AS	02/15/12 14:16	
EPA 200.7	Potassium	0.91	mg/L	0.50	0.07		W206227	AS	02/15/12 14:16	
EPA 200.7	Silicon	21.2	mg/L	0.08	0.03		W206227	AS	02/15/12 14:16	
EPA 200.7	Sodium	22.0	mg/L	0.50	0.04		W206227	AS	02/15/12 14:16	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W206227	AS	02/15/12 14:16	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W206227	AS	02/15/12 14:16	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0021		W206227	AS	02/15/12 14:16	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W206208	KWH	02/20/12 11:30	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W206208	KWH	02/20/12 11:30	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000077		W206208	KWH	02/20/12 13:53	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.000013		W206208	KWH	02/20/12 11:30	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.000072		W206208	KWH	02/20/12 11:30	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000013		W206208	KWH	02/20/12 11:30	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W206208	KWH	02/20/12 11:30	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.0000074		W206208	KWH	02/20/12 11:30	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000033		W206208	KWH	02/20/12 11:30	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000049		W206208	KWH	02/20/12 11:30	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W206190	DJA	02/13/12 10:43	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0005		W206262	IIT	02/10/12 17:45	H1
EPA 120.1	Specific conductance	384	µmhos/cm	5.00			W206216	JMS	02/10/12 08:22	
EPA 180.1	Turbidity	5.39	NTU	0.100			W206197	SM	02/09/12 12:18	H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W206213	IIT	02/10/12 13:07	H1
EPA 350.1	Ammonia as N	0.049	mg/L	0.030	0.006		W207052	RHW	02/14/12 07:32	
EPA 353.2	Nitrate/Nitrite as N	0.085	mg/L	0.050	0.015		W207019	RHW	02/15/12 12:52	
SM 2320B/2310B	Bicarbonate	208	mg/L	1.0	0.5		W206198	DKS	02/09/12 14:05	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.5		W206198	DKS	02/09/12 14:05	
SM 2320B/2310B	Total Alkalinity	208	mg/L	1.0	0.5		W206198	DKS	02/09/12 14:05	
SM 2540 C	Total Diss. Solids	200	mg/L	20			W206218	JMS	02/10/12 12:25	H3
SM 2540 D	Total Susp. Solids	18.0	mg/L	10.0			W206217	JMS	02/10/12 12:25	H3
SM 4500 H B	pH @23.0°C	7.60	pH Units				W206198	DKS	02/09/12 14:05	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W206212	IIT	02/10/12 12:27	H1
SM 4500-P-E	Phosphorus	0.057	mg/L	0.010	0.004		W207041	SM	02/16/12 15:48	



One Government Gulch - PO Box 929

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Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace Ste 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: **W2B0100**

Reported: 23-Feb-12 10:43

Client Sample ID: **M2-PZ-1-TW**

SVL Sample ID: **W2B0100-10 (Ground Water)**

Sample Report Page 3 of 3

Sampled: 26-Jan-12 11:50

Received: 06-Feb-12

Sampled By:

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	5.22	mg/L	0.20	0.07		W207035	AEW	02/13/12 22:31	
EPA 300.0	Fluoride	0.12	mg/L	0.10	0.02		W207035	AEW	02/13/12 22:31	
EPA 300.0	Sulfate as SO4	1.05	mg/L	0.30	0.04		W207035	AEW	02/13/12 22:31	

Cation/Anion Balance and TDS Ratios

Cation Sum: 4.01 meq/L Anion Sum: 4.34 meq/L C/A Balance: -3.89 % Calculated TDS: 263 TDS/cTDS: 0.76 TDS/eC: 0.52

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace Ste 201
Boise, ID 83707

Project Name: **Suriname Merian 2012 / 113-93245**
Work Order: **W2B0100**
Reported: 23-Feb-12 10:43

Quality Control - BLANK Data

Method	Analyte	Units	Result	MDL	MRL	Batch ID	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	mg/L	<0.00020	0.000072	0.00020	W206189	13-Feb-12	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	mg/L	<0.080	0.008	0.080	W206246	13-Feb-12	
EPA 200.7	Barium	mg/L	<0.0020	0.0002	0.0020	W206246	13-Feb-12	
EPA 200.7	Boron	mg/L	<0.040	0.005	0.040	W206246	13-Feb-12	
EPA 200.7	Calcium	mg/L	<0.040	0.006	0.040	W206246	13-Feb-12	
EPA 200.7	Chromium	mg/L	<0.0060	0.0003	0.0060	W206246	13-Feb-12	
EPA 200.7	Cobalt	mg/L	<0.0060	0.0005	0.0060	W206246	13-Feb-12	
EPA 200.7	Iron	mg/L	<0.060	0.008	0.060	W206246	13-Feb-12	
EPA 200.7	Magnesium	mg/L	<0.060	0.010	0.060	W206246	13-Feb-12	
EPA 200.7	Manganese	mg/L	<0.0040	0.0006	0.0040	W206246	13-Feb-12	
EPA 200.7	Molybdenum	mg/L	<0.008	0.0006	0.008	W206246	13-Feb-12	
EPA 200.7	Nickel	mg/L	<0.010	0.002	0.010	W206246	13-Feb-12	
EPA 200.7	Potassium	mg/L	<0.50	0.03	0.50	W206246	13-Feb-12	
EPA 200.7	Silicon	mg/L	<0.08	0.01	0.08	W206246	13-Feb-12	
EPA 200.7	Sodium	mg/L	<0.50	0.02	0.50	W206246	13-Feb-12	
EPA 200.7	Titanium	mg/L	<0.0050	0.0002	0.0050	W206246	13-Feb-12	
EPA 200.7	Vanadium	mg/L	<0.0050	0.0002	0.0050	W206246	13-Feb-12	
EPA 200.7	Zinc	mg/L	<0.0100	0.0010	0.0100	W206246	13-Feb-12	
EPA 200.8	Antimony	mg/L	<0.00300	0.00015	0.00300	W206207	20-Feb-12	
EPA 200.8	Arsenic	mg/L	<0.0030	0.0003	0.0030	W206207	20-Feb-12	
EPA 200.8	Beryllium	mg/L	<0.000200	0.000096	0.000200	W206207	20-Feb-12	
EPA 200.8	Copper	mg/L	<0.00100	0.00009	0.00100	W206207	20-Feb-12	
EPA 200.8	Lead	mg/L	<0.00300	0.000016	0.00300	W206207	20-Feb-12	
EPA 200.8	Selenium	mg/L	<0.00300	0.00028	0.00300	W206207	20-Feb-12	
EPA 200.8	Silver	mg/L	<0.000100	0.000009	0.000100	W206207	20-Feb-12	
EPA 200.8	Uranium	mg/L	<0.00100	0.000006	0.00100	W206207	20-Feb-12	
EPA 200.8	Thallium	mg/L	<0.00100	0.000004	0.00100	W206207	20-Feb-12	
EPA 200.8	Cadmium	mg/L	<0.00020	0.00002	0.00020	W206207	20-Feb-12	

Metals (Dissolved)

EPA 200.7	Aluminum	mg/L	<0.080	0.016	0.080	W206227	15-Feb-12	
EPA 200.7	Barium	mg/L	<0.0020	0.0004	0.0020	W206227	15-Feb-12	
EPA 200.7	Boron	mg/L	<0.040	0.010	0.040	W206227	15-Feb-12	
EPA 200.7	Calcium	mg/L	<0.040	0.012	0.040	W206227	15-Feb-12	
EPA 200.7	Chromium	mg/L	<0.0060	0.0006	0.0060	W206227	15-Feb-12	
EPA 200.7	Cobalt	mg/L	<0.0060	0.0009	0.0060	W206227	15-Feb-12	
EPA 200.7	Iron	mg/L	<0.060	0.017	0.060	W206227	15-Feb-12	
EPA 200.7	Magnesium	mg/L	<0.060	0.021	0.060	W206227	15-Feb-12	
EPA 200.7	Manganese	mg/L	<0.0040	0.0011	0.0040	W206227	15-Feb-12	
EPA 200.7	Molybdenum	mg/L	<0.008	0.001	0.008	W206227	15-Feb-12	
EPA 200.7	Nickel	mg/L	<0.010	0.003	0.010	W206227	15-Feb-12	
EPA 200.7	Potassium	mg/L	<0.50	0.07	0.50	W206227	15-Feb-12	
EPA 200.7	Silicon	mg/L	<0.08	0.03	0.08	W206227	15-Feb-12	
EPA 200.7	Sodium	mg/L	<0.50	0.04	0.50	W206227	15-Feb-12	
EPA 200.7	Titanium	mg/L	<0.0050	0.0003	0.0050	W206227	15-Feb-12	
EPA 200.7	Vanadium	mg/L	<0.0050	0.0005	0.0050	W206227	15-Feb-12	
EPA 200.7	Zinc	mg/L	<0.0100	0.0021	0.0100	W206227	15-Feb-12	
EPA 200.8	Antimony	mg/L	<0.00300	0.00012	0.00300	W206208	20-Feb-12	
EPA 200.8	Arsenic	mg/L	<0.0030	0.0002	0.0030	W206208	20-Feb-12	
EPA 200.8	Beryllium	mg/L	<0.000200	0.000077	0.000200	W206208	20-Feb-12	
EPA 200.8	Cadmium	mg/L	<0.00020	0.000013	0.00020	W206208	20-Feb-12	
EPA 200.8	Copper	mg/L	<0.00100	0.000072	0.00100	W206208	20-Feb-12	
EPA 200.8	Lead	mg/L	<0.00300	0.000013	0.00300	W206208	20-Feb-12	
EPA 200.8	Selenium	mg/L	<0.00300	0.00022	0.00300	W206208	20-Feb-12	
EPA 200.8	Silver	mg/L	<0.000100	0.0000074	0.000100	W206208	20-Feb-12	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



Tetra Tech EM, Inc. (Boise)
 3380 Americana Terrace Ste 201
 Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
 Work Order: **W2B0100**
 Reported: 23-Feb-12 10:43

Quality Control - BLANK Data (Continued)

Method	Analyte	Units	Result	MDL	MRL	Batch ID	Analyzed	Notes
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Metals (Dissolved) (Continued)

EPA 200.8	Thallium	mg/L	<0.00100	0.0000033	0.00100	W206208	20-Feb-12	
EPA 200.8	Uranium	mg/L	<0.00100	0.0000049	0.00100	W206208	20-Feb-12	
EPA 245.1	Mercury	mg/L	<0.00020	0.000072	0.00020	W206190	13-Feb-12	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	mg/L	<0.005	0.0005	0.005	W206262	10-Feb-12	
EPA 120.1	Specific conductance	µmhos/cm	<5.00		5.00	W206216	10-Feb-12	
EPA 180.1	Turbidity	NTU	<0.100		0.100	W206197	09-Feb-12	
EPA 335.4	Cyanide (total)	mg/L	<0.0100	0.0021	0.0100	W206213	10-Feb-12	
EPA 350.1	Ammonia as N	mg/L	<0.030	0.006	0.030	W207052	14-Feb-12	
EPA 353.2	Nitrate/Nitrite as N	mg/L	<0.050	0.015	0.050	W207019	15-Feb-12	
EPA 353.2	Nitrate/Nitrite as N	mg/L	<0.050	0.015	0.050	W208104	22-Feb-12	
SM 2540 C	Total Diss. Solids	mg/L	<10		10	W206218	10-Feb-12	
SM 2540 D	Total Susp. Solids	mg/L	<5.0		5.0	W206217	10-Feb-12	
SM 4500-CN-I	Cyanide (WAD)	mg/L	<0.0100	0.0006	0.0100	W206212	10-Feb-12	
SM 4500-P-E	Phosphorus	mg/L	<0.010	0.004	0.010	W207041	16-Feb-12	

Anions by Ion Chromatography

EPA 300.0	Fluoride	mg/L	<0.10	0.02	0.10	W207035	13-Feb-12	
EPA 300.0	Chloride	mg/L	<0.20	0.07	0.20	W207035	13-Feb-12	
EPA 300.0	Sulfate as SO4	mg/L	<0.30	0.04	0.30	W207035	13-Feb-12	

Quality Control - LABORATORY CONTROL SAMPLE Data

Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	mg/L	0.00483	0.00500	96.6	85 - 115	W206189	13-Feb-12	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	mg/L	1.01	1.00	101	85 - 115	W206246	13-Feb-12	
EPA 200.7	Barium	mg/L	0.995	1.00	99.5	85 - 115	W206246	13-Feb-12	
EPA 200.7	Boron	mg/L	0.991	1.00	99.1	85 - 115	W206246	13-Feb-12	
EPA 200.7	Calcium	mg/L	19.2	20.0	96.1	85 - 115	W206246	13-Feb-12	
EPA 200.7	Chromium	mg/L	0.981	1.00	98.1	85 - 115	W206246	13-Feb-12	
EPA 200.7	Cobalt	mg/L	0.965	1.00	96.5	85 - 115	W206246	13-Feb-12	
EPA 200.7	Iron	mg/L	9.41	10.0	94.1	85 - 115	W206246	13-Feb-12	
EPA 200.7	Magnesium	mg/L	19.4	20.0	96.8	85 - 115	W206246	13-Feb-12	
EPA 200.7	Manganese	mg/L	0.981	1.00	98.1	85 - 115	W206246	13-Feb-12	
EPA 200.7	Molybdenum	mg/L	0.985	1.00	98.5	85 - 115	W206246	13-Feb-12	
EPA 200.7	Nickel	mg/L	0.954	1.00	95.4	85 - 115	W206246	13-Feb-12	
EPA 200.7	Potassium	mg/L	19.9	20.0	99.3	85 - 115	W206246	13-Feb-12	
EPA 200.7	Silicon	mg/L	4.82	5.00	96.5	85 - 115	W206246	13-Feb-12	
EPA 200.7	Sodium	mg/L	19.0	19.0	99.8	85 - 115	W206246	13-Feb-12	
EPA 200.7	Titanium	mg/L	0.973	1.00	97.3	85 - 115	W206246	13-Feb-12	
EPA 200.7	Vanadium	mg/L	0.990	1.00	99.0	85 - 115	W206246	13-Feb-12	
EPA 200.7	Zinc	mg/L	0.960	1.00	96.0	85 - 115	W206246	13-Feb-12	
EPA 200.8	Antimony	mg/L	0.0281	0.0250	112	85 - 115	W206207	20-Feb-12	
EPA 200.8	Arsenic	mg/L	0.0258	0.0250	103	85 - 115	W206207	20-Feb-12	
EPA 200.8	Beryllium	mg/L	0.0254	0.0250	102	85 - 115	W206207	20-Feb-12	
EPA 200.8	Copper	mg/L	0.0253	0.0250	101	85 - 115	W206207	20-Feb-12	
EPA 200.8	Lead	mg/L	0.0244	0.0250	97.6	85 - 115	W206207	20-Feb-12	
EPA 200.8	Selenium	mg/L	0.0262	0.0250	105	85 - 115	W206207	20-Feb-12	
EPA 200.8	Silver	mg/L	0.0258	0.0250	103	85 - 115	W206207	20-Feb-12	
EPA 200.8	Uranium	mg/L	0.0246	0.0250	98.3	85 - 115	W206207	20-Feb-12	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



Tetra Tech EM, Inc. (Boise)
 3380 Americana Terrace Ste 201
 Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
 Work Order: **W2B0100**
 Reported: 23-Feb-12 10:43

Quality Control - LABORATORY CONTROL SAMPLE Data (Continued)

Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Total Recoverable--reportable as Total per 40 CFR 136) (Continued)

EPA 200.8	Thallium	mg/L	0.0246	0.0250	98.5	85 - 115	W206207	20-Feb-12	
EPA 200.8	Cadmium	mg/L	0.0256	0.0250	103	85 - 115	W206207	20-Feb-12	

Metals (Dissolved)

EPA 200.7	Aluminum	mg/L	0.972	1.00	97.2	85 - 115	W206227	15-Feb-12	
EPA 200.7	Barium	mg/L	0.994	1.00	99.4	85 - 115	W206227	15-Feb-12	
EPA 200.7	Boron	mg/L	0.987	1.00	98.7	85 - 115	W206227	15-Feb-12	
EPA 200.7	Calcium	mg/L	18.4	20.0	92.0	85 - 115	W206227	15-Feb-12	
EPA 200.7	Chromium	mg/L	0.980	1.00	98.0	85 - 115	W206227	15-Feb-12	
EPA 200.7	Cobalt	mg/L	0.941	1.00	94.1	85 - 115	W206227	15-Feb-12	
EPA 200.7	Iron	mg/L	9.50	10.0	95.0	85 - 115	W206227	15-Feb-12	
EPA 200.7	Magnesium	mg/L	18.6	20.0	92.8	85 - 115	W206227	15-Feb-12	
EPA 200.7	Manganese	mg/L	0.972	1.00	97.2	85 - 115	W206227	15-Feb-12	
EPA 200.7	Molybdenum	mg/L	0.933	1.00	93.3	85 - 115	W206227	15-Feb-12	
EPA 200.7	Nickel	mg/L	0.939	1.00	93.9	85 - 115	W206227	15-Feb-12	
EPA 200.7	Potassium	mg/L	18.8	20.0	94.0	85 - 115	W206227	15-Feb-12	
EPA 200.7	Silicon	mg/L	4.78	5.00	95.5	85 - 115	W206227	15-Feb-12	
EPA 200.7	Sodium	mg/L	17.3	19.0	90.9	85 - 115	W206227	15-Feb-12	
EPA 200.7	Titanium	mg/L	1.00	1.00	100	85 - 115	W206227	15-Feb-12	
EPA 200.7	Vanadium	mg/L	0.995	1.00	99.5	85 - 115	W206227	15-Feb-12	
EPA 200.7	Zinc	mg/L	0.906	1.00	90.6	85 - 115	W206227	15-Feb-12	
EPA 200.8	Antimony	mg/L	0.0264	0.0250	106	85 - 115	W206208	20-Feb-12	
EPA 200.8	Arsenic	mg/L	0.0264	0.0250	106	85 - 115	W206208	20-Feb-12	
EPA 200.8	Beryllium	mg/L	0.0270	0.0250	108	85 - 115	W206208	20-Feb-12	
EPA 200.8	Cadmium	mg/L	0.0263	0.0250	105	85 - 115	W206208	20-Feb-12	
EPA 200.8	Copper	mg/L	0.0257	0.0250	103	85 - 115	W206208	20-Feb-12	
EPA 200.8	Lead	mg/L	0.0253	0.0250	101	85 - 115	W206208	20-Feb-12	
EPA 200.8	Selenium	mg/L	0.0265	0.0250	106	85 - 115	W206208	20-Feb-12	
EPA 200.8	Silver	mg/L	0.0256	0.0250	102	85 - 115	W206208	20-Feb-12	
EPA 200.8	Thallium	mg/L	0.0256	0.0250	102	85 - 115	W206208	20-Feb-12	
EPA 200.8	Uranium	mg/L	0.0262	0.0250	105	85 - 115	W206208	20-Feb-12	
EPA 245.1	Mercury	mg/L	0.00509	0.00500	102	85 - 115	W206190	13-Feb-12	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	mg/L	0.144	0.150	96.3	85 - 115	W206262	10-Feb-12	
EPA 120.1	Specific conductance	µmhos/cm	423	421	100	90 - 110	W206216	10-Feb-12	
EPA 180.1	Turbidity	NTU	4.52	4.39	103	90 - 110	W206197	09-Feb-12	
EPA 335.4	Cyanide (total)	mg/L	0.152	0.150	101	90 - 110	W206213	10-Feb-12	
EPA 350.1	Ammonia as N	mg/L	0.725	0.750	96.7	90 - 110	W207052	14-Feb-12	
EPA 353.2	Nitrate/Nitrite as N	mg/L	1.97	2.00	98.3	90 - 110	W207019	15-Feb-12	
EPA 353.2	Nitrate/Nitrite as N	mg/L	1.98	2.00	99.2	90 - 110	W208104	22-Feb-12	
SM 4500-CN-I	Cyanide (WAD)	mg/L	0.149	0.150	99.3	90 - 110	W206212	10-Feb-12	
SM 4500-P-E	Phosphorus	mg/L	0.915	0.877	104	90 - 110	W207041	16-Feb-12	

Anions by Ion Chromatography

EPA 300.0	Fluoride	mg/L	1.99	2.00	99.3	90 - 110	W207035	13-Feb-12	
EPA 300.0	Chloride	mg/L	3.09	3.00	103	90 - 110	W207035	13-Feb-12	
EPA 300.0	Sulfate as SO4	mg/L	10.6	10.0	106	90 - 110	W207035	13-Feb-12	



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace Ste 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2B0100**
Reported: 23-Feb-12 10:43

Quality Control - DUPLICATE Data

Method	Analyte	Units	Duplicate Result	Sample Result	RPD	RPD Limit	Batch ID	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	mg/L	<0.00020	<0.00020	UDL	20	W206189	13-Feb-12	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	mg/L	<0.080	<0.080	<RL	20	W206246	13-Feb-12	
EPA 200.7	Barium	mg/L	0.0207	0.0214	3.4	20	W206246	13-Feb-12	
EPA 200.7	Boron	mg/L	<0.040	<0.040	<RL	20	W206246	13-Feb-12	
EPA 200.7	Calcium	mg/L	62.2	63.2	1.7	20	W206246	13-Feb-12	
EPA 200.7	Chromium	mg/L	<0.0060	<0.0060	<RL	20	W206246	13-Feb-12	
EPA 200.7	Cobalt	mg/L	<0.0060	<0.0060	UDL	20	W206246	13-Feb-12	
EPA 200.7	Iron	mg/L	<0.060	<0.060	<RL	20	W206246	13-Feb-12	
EPA 200.7	Magnesium	mg/L	85.0	86.7	2.0	20	W206246	13-Feb-12	
EPA 200.7	Manganese	mg/L	0.230	0.234	1.8	20	W206246	13-Feb-12	
EPA 200.7	Molybdenum	mg/L	<0.008	<0.008	<RL	20	W206246	13-Feb-12	
EPA 200.7	Nickel	mg/L	<0.010	<0.010	UDL	20	W206246	13-Feb-12	
EPA 200.7	Potassium	mg/L	10.4	10.7	2.5	20	W206246	13-Feb-12	
EPA 200.7	Silicon	mg/L	3.45	3.49	1.2	20	W206246	13-Feb-12	
EPA 200.7	Sodium	mg/L	9.43	9.73	3.1	20	W206246	13-Feb-12	
EPA 200.7	Titanium	mg/L	<0.0050	<0.0050	UDL	20	W206246	13-Feb-12	
EPA 200.7	Vanadium	mg/L	<0.0050	<0.0050	<RL	20	W206246	13-Feb-12	
EPA 200.7	Zinc	mg/L	<0.0100	<0.0100	<RL	20	W206246	13-Feb-12	
EPA 200.8	Antimony	mg/L	0.00498	0.00500	0.5	20	W206207	20-Feb-12	
EPA 200.8	Arsenic	mg/L	0.0042	0.0045	6.2	20	W206207	20-Feb-12	
EPA 200.8	Beryllium	mg/L	<0.000200	<0.000200	UDL	20	W206207	20-Feb-12	
EPA 200.8	Copper	mg/L	<0.00100	<0.00100	<RL	20	W206207	20-Feb-12	
EPA 200.8	Lead	mg/L	<0.00300	<0.00300	UDL	20	W206207	20-Feb-12	
EPA 200.8	Selenium	mg/L	<0.00300	<0.00300	UDL	20	W206207	20-Feb-12	
EPA 200.8	Silver	mg/L	<0.000100	<0.000100	UDL	20	W206207	20-Feb-12	
EPA 200.8	Uranium	mg/L	<0.00100	<0.00100	<RL	20	W206207	20-Feb-12	
EPA 200.8	Thallium	mg/L	<0.00100	<0.00100	<RL	20	W206207	20-Feb-12	
EPA 200.8	Cadmium	mg/L	<0.00020	<0.00020	UDL	20	W206207	20-Feb-12	

Metals (Dissolved)

EPA 200.7	Aluminum	mg/L	<0.080	<0.080	UDL	20	W206227	15-Feb-12	
EPA 200.7	Barium	mg/L	0.0333	0.0332	0.4	20	W206227	15-Feb-12	
EPA 200.7	Boron	mg/L	0.105	0.102	2.6	20	W206227	15-Feb-12	
EPA 200.7	Calcium	mg/L	24.6	24.5	0.1	20	W206227	15-Feb-12	
EPA 200.7	Chromium	mg/L	<0.0060	<0.0060	UDL	20	W206227	15-Feb-12	
EPA 200.7	Cobalt	mg/L	<0.0060	<0.0060	<RL	20	W206227	15-Feb-12	
EPA 200.7	Iron	mg/L	<0.060	<0.060	UDL	20	W206227	15-Feb-12	
EPA 200.7	Magnesium	mg/L	6.54	6.63	1.5	20	W206227	15-Feb-12	
EPA 200.7	Manganese	mg/L	<0.0040	<0.0040	UDL	20	W206227	15-Feb-12	
EPA 200.7	Molybdenum	mg/L	<0.008	<0.008	<RL	20	W206227	15-Feb-12	
EPA 200.7	Nickel	mg/L	<0.010	<0.010	<RL	20	W206227	15-Feb-12	
EPA 200.7	Potassium	mg/L	3.20	3.22	0.8	20	W206227	15-Feb-12	
EPA 200.7	Silicon	mg/L	26.6	26.7	0.0	20	W206227	15-Feb-12	
EPA 200.7	Sodium	mg/L	22.1	22.0	0.4	20	W206227	15-Feb-12	
EPA 200.7	Titanium	mg/L	<0.0050	<0.0050	UDL	20	W206227	15-Feb-12	
EPA 200.7	Vanadium	mg/L	0.0114	0.0115	0.9	20	W206227	15-Feb-12	
EPA 200.7	Zinc	mg/L	<0.0100	<0.0100	UDL	20	W206227	15-Feb-12	
EPA 200.8	Antimony	mg/L	<0.00300	<0.00300	UDL	20	W206208	20-Feb-12	
EPA 200.8	Arsenic	mg/L	<0.0030	<0.0030	<RL	20	W206208	20-Feb-12	
EPA 200.8	Beryllium	mg/L	<0.000200	<0.000200	UDL	20	W206208	20-Feb-12	
EPA 200.8	Cadmium	mg/L	<0.00020	<0.00020	UDL	20	W206208	20-Feb-12	
EPA 200.8	Copper	mg/L	0.00112	0.00120	6.3	20	W206208	20-Feb-12	
EPA 200.8	Lead	mg/L	<0.00300	<0.00300	<RL	20	W206208	20-Feb-12	
EPA 200.8	Selenium	mg/L	<0.00300	<0.00300	UDL	20	W206208	20-Feb-12	
EPA 200.8	Silver	mg/L	<0.000100	<0.000100	UDL	20	W206208	20-Feb-12	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace Ste 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2B0100**
Reported: 23-Feb-12 10:43

Quality Control - DUPLICATE Data (Continued)

Method	Analyte	Units	Duplicate Result	Sample Result	RPD	RPD Limit	Batch ID	Analyzed	Notes
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Metals (Dissolved) (Continued)

EPA 200.8	Thallium	mg/L	<0.00100	<0.00100	UDL	20	W206208	20-Feb-12	
EPA 200.8	Uranium	mg/L	<0.00100	<0.00100	<RL	20	W206208	20-Feb-12	
EPA 245.1	Mercury	mg/L	<0.00020	<0.00020	UDL	20	W206190	13-Feb-12	

Classical Chemistry Parameters

EPA 120.1	Specific conductance	µmhos/cm	43.6	45.0	3.2	20	W206216	10-Feb-12	
EPA 120.1	Specific conductance	µmhos/cm	730	734	0.5	20	W206216	10-Feb-12	
EPA 180.1	Turbidity	NTU	7.06	7.28	3.1	20	W206197	09-Feb-12	
EPA 335.4	Cyanide (total)	mg/L	<0.0100	<0.0100	UDL	20	W206213	10-Feb-12	
EPA 350.1	Ammonia as N	mg/L	0.054	0.077	36.1	20	W207052	14-Feb-12	R2
EPA 353.2	Nitrate/Nitrite as N	mg/L	0.360	0.396	9.7	20	W208104	22-Feb-12	
EPA 353.2	Nitrate/Nitrite as N	mg/L	1.68	1.61	4.7	20	W207019	15-Feb-12	
SM 2320B/2310B	Total Alkalinity	mg/L	12.6	11.3	10.9	20	W206198	09-Feb-12	
SM 2320B/2310B	Bicarbonate	mg/L	12.6	11.3	10.9	20	W206198	09-Feb-12	
SM 2320B/2310B	Carbonate	mg/L	<1.0	<1.0	UDL	20	W206198	09-Feb-12	
SM 2540 C	Total Diss. Solids	mg/L	80	60	28.6	10	W206218	10-Feb-12	R1
SM 2540 D	Total Susp. Solids	mg/L	740	728	1.6	10	W206217	10-Feb-12	
SM 4500 H B	pH	pH Units	5.59	5.51	1.4	20	W206198	09-Feb-12	
SM 4500-CN-I	Cyanide (WAD)	mg/L	<0.0100	<0.0100	<RL	20	W206212	10-Feb-12	
SM 4500-P-E	Phosphorus	mg/L	0.043	0.044	3.0	20	W207041	16-Feb-12	

Anions by Ion Chromatography

EPA 300.0	Fluoride	mg/L	<0.10	<0.10	<RL	20	W207035	13-Feb-12	
EPA 300.0	Chloride	mg/L	4.92	4.90	0.4	20	W207035	13-Feb-12	
EPA 300.0	Sulfate as SO4	mg/L	0.99	0.95	3.4	20	W207035	13-Feb-12	

Quality Control - MATRIX SPIKE Data

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	mg/L	0.00188	<0.00020	0.00200	94.0	70 - 130	W206189	13-Feb-12	
EPA 245.1	Mercury	mg/L	0.0282	0.0282	0.00100	R > 4S	70 - 130	W206189	13-Feb-12	M4

Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	mg/L	1.02	<0.080	1.00	98.4	70 - 130	W206246	13-Feb-12	
EPA 200.7	Aluminum	mg/L	1.19	0.117	1.00	107	70 - 130	W206246	13-Feb-12	
EPA 200.7	Barium	mg/L	0.940	0.0214	1.00	91.8	70 - 130	W206246	13-Feb-12	
EPA 200.7	Barium	mg/L	0.975	0.0267	1.00	94.8	70 - 130	W206246	13-Feb-12	
EPA 200.7	Boron	mg/L	0.962	<0.040	1.00	93.3	70 - 130	W206246	13-Feb-12	
EPA 200.7	Boron	mg/L	0.993	<0.040	1.00	96.8	70 - 130	W206246	13-Feb-12	
EPA 200.7	Calcium	mg/L	79.6	63.2	20.0	81.5	70 - 130	W206246	13-Feb-12	
EPA 200.7	Calcium	mg/L	68.4	51.9	20.0	82.6	70 - 130	W206246	13-Feb-12	
EPA 200.7	Chromium	mg/L	0.900	<0.0060	1.00	90.0	70 - 130	W206246	13-Feb-12	
EPA 200.7	Chromium	mg/L	0.928	<0.0060	1.00	92.7	70 - 130	W206246	13-Feb-12	
EPA 200.7	Cobalt	mg/L	0.882	<0.0060	1.00	88.2	70 - 130	W206246	13-Feb-12	
EPA 200.7	Cobalt	mg/L	0.915	<0.0060	1.00	91.4	70 - 130	W206246	13-Feb-12	
EPA 200.7	Iron	mg/L	8.79	<0.060	10.0	87.4	70 - 130	W206246	13-Feb-12	
EPA 200.7	Iron	mg/L	9.24	0.152	10.0	90.9	70 - 130	W206246	13-Feb-12	
EPA 200.7	Magnesium	mg/L	103	86.7	20.0	82.0	70 - 130	W206246	13-Feb-12	M3
EPA 200.7	Magnesium	mg/L	80.8	63.8	20.0	85.2	70 - 130	W206246	13-Feb-12	
EPA 200.7	Manganese	mg/L	1.14	0.234	1.00	90.5	70 - 130	W206246	13-Feb-12	
EPA 200.7	Manganese	mg/L	1.18	0.257	1.00	92.0	70 - 130	W206246	13-Feb-12	
EPA 200.7	Molybdenum	mg/L	0.920	<0.008	1.00	91.5	70 - 130	W206246	13-Feb-12	
EPA 200.7	Molybdenum	mg/L	0.952	<0.008	1.00	94.7	70 - 130	W206246	13-Feb-12	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



Tetra Tech EM, Inc. (Boise)
 3380 Americana Terrace Ste 201
 Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
 Work Order: **W2B0100**
 Reported: 23-Feb-12 10:43

Quality Control - MATRIX SPIKE Data (Continued)

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Total Recoverable--reportable as Total per 40 CFR 136) (Continued)

EPA 200.7	Nickel	mg/L	0.922	<0.010	1.00	92.2	70 - 130	W206246	13-Feb-12	
EPA 200.7	Nickel	mg/L	0.944	<0.010	1.00	94.4	70 - 130	W206246	13-Feb-12	
EPA 200.7	Potassium	mg/L	30.0	10.7	20.0	96.3	70 - 130	W206246	13-Feb-12	
EPA 200.7	Potassium	mg/L	27.6	8.01	20.0	98.0	70 - 130	W206246	13-Feb-12	
EPA 200.7	Silicon	mg/L	7.93	3.49	5.00	88.8	70 - 130	W206246	13-Feb-12	
EPA 200.7	Silicon	mg/L	8.23	3.54	5.00	93.8	70 - 130	W206246	13-Feb-12	
EPA 200.7	Sodium	mg/L	27.9	9.73	19.0	95.7	70 - 130	W206246	13-Feb-12	
EPA 200.7	Sodium	mg/L	27.2	8.67	19.0	97.4	70 - 130	W206246	13-Feb-12	
EPA 200.7	Titanium	mg/L	0.912	<0.0050	1.00	91.2	70 - 130	W206246	13-Feb-12	
EPA 200.7	Titanium	mg/L	0.942	<0.0050	1.00	94.2	70 - 130	W206246	13-Feb-12	
EPA 200.7	Vanadium	mg/L	0.930	<0.0050	1.00	92.9	70 - 130	W206246	13-Feb-12	
EPA 200.7	Vanadium	mg/L	0.959	<0.0050	1.00	95.9	70 - 130	W206246	13-Feb-12	
EPA 200.7	Zinc	mg/L	0.861	<0.0100	1.00	85.8	70 - 130	W206246	13-Feb-12	
EPA 200.7	Zinc	mg/L	0.890	<0.0100	1.00	88.4	70 - 130	W206246	13-Feb-12	
EPA 200.8	Antimony	mg/L	0.0330	0.00500	0.0250	112	70 - 130	W206207	20-Feb-12	
EPA 200.8	Antimony	mg/L	0.515	0.492	0.0250	90.4	70 - 130	W206207	20-Feb-12	D5
EPA 200.8	Arsenic	mg/L	0.0298	0.0045	0.0250	101	70 - 130	W206207	20-Feb-12	
EPA 200.8	Arsenic	mg/L	2.81	2.81	0.0250	R > 4S	70 - 130	W206207	20-Feb-12	D5,M3
EPA 200.8	Beryllium	mg/L	0.0231	<0.000200	0.0250	92.2	70 - 130	W206207	20-Feb-12	
EPA 200.8	Beryllium	mg/L	0.0133	<0.000200	0.0250	53.3	70 - 130	W206207	20-Feb-12	M2
EPA 200.8	Copper	mg/L	0.0248	<0.00100	0.0250	97.4	70 - 130	W206207	20-Feb-12	
EPA 200.8	Copper	mg/L	2.97	2.99	0.0250	R > 4S	70 - 130	W206207	20-Feb-12	D5,M3
EPA 200.8	Lead	mg/L	0.0234	<0.00300	0.0250	93.3	70 - 130	W206207	20-Feb-12	
EPA 200.8	Lead	mg/L	0.0241	<0.00300	0.0250	95.0	70 - 130	W206207	20-Feb-12	D5
EPA 200.8	Selenium	mg/L	0.0262	<0.00300	0.0250	105	70 - 130	W206207	20-Feb-12	
EPA 200.8	Selenium	mg/L	1.06	1.03	0.0250	R > 4S	70 - 130	W206207	20-Feb-12	D5,M3
EPA 200.8	Silver	mg/L	0.0245	<0.000100	0.0250	97.9	70 - 130	W206207	20-Feb-12	
EPA 200.8	Silver	mg/L	0.0535	0.0299	0.0250	94.5	70 - 130	W206207	20-Feb-12	
EPA 200.8	Uranium	mg/L	0.0247	<0.00100	0.0250	97.4	70 - 130	W206207	20-Feb-12	
EPA 200.8	Uranium	mg/L	0.0705	0.0427	0.0250	111	70 - 130	W206207	20-Feb-12	D5
EPA 200.8	Thallium	mg/L	0.0240	<0.00100	0.0250	95.5	70 - 130	W206207	20-Feb-12	
EPA 200.8	Thallium	mg/L	0.0850	0.0612	0.0250	95.3	70 - 130	W206207	20-Feb-12	D5
EPA 200.8	Cadmium	mg/L	0.0247	<0.00020	0.0250	98.9	70 - 130	W206207	20-Feb-12	
EPA 200.8	Cadmium	mg/L	0.0695	0.0458	0.0250	94.9	70 - 130	W206207	20-Feb-12	D5

Metals (Dissolved)

EPA 200.7	Aluminum	mg/L	1.03	<0.080	1.00	103	70 - 130	W206227	15-Feb-12	
EPA 200.7	Aluminum	mg/L	1.02	<0.080	1.00	102	70 - 130	W206227	15-Feb-12	
EPA 200.7	Barium	mg/L	1.05	0.0332	1.00	102	70 - 130	W206227	15-Feb-12	
EPA 200.7	Barium	mg/L	1.12	0.120	1.00	100	70 - 130	W206227	15-Feb-12	
EPA 200.7	Boron	mg/L	1.15	0.102	1.00	105	70 - 130	W206227	15-Feb-12	
EPA 200.7	Boron	mg/L	1.15	0.109	1.00	104	70 - 130	W206227	15-Feb-12	
EPA 200.7	Calcium	mg/L	43.6	24.5	20.0	95.4	70 - 130	W206227	15-Feb-12	
EPA 200.7	Calcium	mg/L	85.4	67.5	20.0	89.7	70 - 130	W206227	15-Feb-12	
EPA 200.7	Chromium	mg/L	1.00	<0.0060	1.00	100	70 - 130	W206227	15-Feb-12	
EPA 200.7	Chromium	mg/L	0.996	<0.0060	1.00	99.6	70 - 130	W206227	15-Feb-12	
EPA 200.7	Cobalt	mg/L	0.954	<0.0060	1.00	95.3	70 - 130	W206227	15-Feb-12	
EPA 200.7	Cobalt	mg/L	0.937	<0.0060	1.00	93.7	70 - 130	W206227	15-Feb-12	
EPA 200.7	Iron	mg/L	9.98	<0.060	10.0	99.8	70 - 130	W206227	15-Feb-12	
EPA 200.7	Iron	mg/L	10.1	0.065	10.0	99.9	70 - 130	W206227	15-Feb-12	
EPA 200.7	Magnesium	mg/L	25.9	6.63	20.0	96.3	70 - 130	W206227	15-Feb-12	
EPA 200.7	Magnesium	mg/L	35.7	17.0	20.0	93.5	70 - 130	W206227	15-Feb-12	
EPA 200.7	Manganese	mg/L	1.02	<0.0040	1.00	102	70 - 130	W206227	15-Feb-12	
EPA 200.7	Manganese	mg/L	1.02	<0.0040	1.00	102	70 - 130	W206227	15-Feb-12	
EPA 200.7	Molybdenum	mg/L	0.941	<0.008	1.00	93.7	70 - 130	W206227	15-Feb-12	
EPA 200.7	Molybdenum	mg/L	0.928	<0.008	1.00	92.4	70 - 130	W206227	15-Feb-12	
EPA 200.7	Nickel	mg/L	0.969	<0.010	1.00	96.5	70 - 130	W206227	15-Feb-12	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



Tetra Tech EM, Inc. (Boise)
 3380 Americana Terrace Ste 201
 Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
 Work Order: **W2B0100**
 Reported: 23-Feb-12 10:43

Quality Control - MATRIX SPIKE Data (Continued)

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Dissolved) (Continued)

EPA 200.7	Nickel	mg/L	0.958	<0.010	1.00	95.8	70 - 130	W206227	15-Feb-12	
EPA 200.7	Potassium	mg/L	22.6	3.22	20.0	97.0	70 - 130	W206227	15-Feb-12	
EPA 200.7	Potassium	mg/L	21.2	1.73	20.0	97.2	70 - 130	W206227	15-Feb-12	
EPA 200.7	Silicon	mg/L	31.5	26.7	5.00	97.9	70 - 130	W206227	15-Feb-12	
EPA 200.7	Silicon	mg/L	14.7	9.69	5.00	101	70 - 130	W206227	15-Feb-12	
EPA 200.7	Sodium	mg/L	39.6	22.0	19.0	92.5	70 - 130	W206227	15-Feb-12	
EPA 200.7	Sodium	mg/L	45.6	28.4	19.0	90.6	70 - 130	W206227	15-Feb-12	
EPA 200.7	Titanium	mg/L	1.05	<0.0050	1.00	105	70 - 130	W206227	15-Feb-12	
EPA 200.7	Titanium	mg/L	1.04	<0.0050	1.00	104	70 - 130	W206227	15-Feb-12	
EPA 200.7	Vanadium	mg/L	1.03	0.0115	1.00	102	70 - 130	W206227	15-Feb-12	
EPA 200.7	Vanadium	mg/L	1.02	<0.0050	1.00	102	70 - 130	W206227	15-Feb-12	
EPA 200.7	Zinc	mg/L	0.924	<0.0100	1.00	92.4	70 - 130	W206227	15-Feb-12	
EPA 200.7	Zinc	mg/L	0.902	<0.0100	1.00	89.7	70 - 130	W206227	15-Feb-12	
EPA 200.8	Antimony	mg/L	0.0275	<0.00300	0.0250	109	70 - 130	W206208	20-Feb-12	
EPA 200.8	Arsenic	mg/L	0.0286	<0.0030	0.0250	113	70 - 130	W206208	20-Feb-12	
EPA 200.8	Beryllium	mg/L	0.0266	<0.000200	0.0250	107	70 - 130	W206208	20-Feb-12	
EPA 200.8	Cadmium	mg/L	0.0274	<0.00020	0.0250	110	70 - 130	W206208	20-Feb-12	
EPA 200.8	Copper	mg/L	0.0275	0.00120	0.0250	105	70 - 130	W206208	20-Feb-12	
EPA 200.8	Lead	mg/L	0.0250	<0.00300	0.0250	98.5	70 - 130	W206208	20-Feb-12	
EPA 200.8	Selenium	mg/L	0.0296	<0.00300	0.0250	118	70 - 130	W206208	20-Feb-12	
EPA 200.8	Silver	mg/L	0.0253	<0.000100	0.0250	101	70 - 130	W206208	20-Feb-12	
EPA 200.8	Thallium	mg/L	0.0250	<0.00100	0.0250	99.8	70 - 130	W206208	20-Feb-12	
EPA 200.8	Uranium	mg/L	0.0251	<0.00100	0.0250	101	70 - 130	W206208	20-Feb-12	
EPA 245.1	Mercury	mg/L	0.00105	<0.00020	0.00100	105	70 - 130	W206190	13-Feb-12	
EPA 245.1	Mercury	mg/L	0.00107	<0.00020	0.00100	107	70 - 130	W206190	13-Feb-12	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	mg/L	0.097	<0.005	0.100	97.5	85 - 115	W206262	10-Feb-12	
EPA 335.4	Cyanide (total)	mg/L	0.103	<0.0100	0.100	103	90 - 110	W206213	10-Feb-12	
EPA 350.1	Ammonia as N	mg/L	0.536	0.077	0.500	91.7	90 - 110	W207052	14-Feb-12	
EPA 350.1	Ammonia as N	mg/L	0.580	0.093	0.500	97.4	90 - 110	W207052	14-Feb-12	
EPA 353.2	Nitrate/Nitrite as N	mg/L	2.74	1.61	1.00	113	90 - 110	W207019	15-Feb-12	M1
EPA 353.2	Nitrate/Nitrite as N	mg/L	1.52	0.414	1.00	111	90 - 110	W207019	15-Feb-12	M1
EPA 353.2	Nitrate/Nitrite as N	mg/L	1.35	0.396	1.00	95.1	90 - 110	W208104	22-Feb-12	
EPA 353.2	Nitrate/Nitrite as N	mg/L	1.02	<0.050	1.00	98.1	90 - 110	W208104	22-Feb-12	
SM 4500-CN-I	Cyanide (WAD)	mg/L	0.102	<0.0100	0.100	101	75 - 125	W206212	10-Feb-12	
SM 4500-CN-I	Cyanide (WAD)	mg/L	0.100	<0.0100	0.100	99.0	75 - 125	W206212	10-Feb-12	
SM 4500-P-E	Phosphorus	mg/L	0.539	0.044	0.500	99.1	75 - 125	W207041	16-Feb-12	

Anions by Ion Chromatography

EPA 300.0	Fluoride	mg/L	2.00	<0.10	2.00	97.5	90 - 110	W207035	13-Feb-12	
EPA 300.0	Fluoride	mg/L	1.76	<0.10	2.00	85.1	90 - 110	W207035	13-Feb-12	M2
EPA 300.0	Chloride	mg/L	8.15	4.90	3.00	108	90 - 110	W207035	13-Feb-12	
EPA 300.0	Chloride	mg/L	19.8	17.5	3.00	R > 4S	90 - 110	W207035	13-Feb-12	D2,M3
EPA 300.0	Sulfate as SO4	mg/L	11.7	0.95	10.0	107	90 - 110	W207035	13-Feb-12	
EPA 300.0	Sulfate as SO4	mg/L	55.9	49.1	10.0	R > 4S	90 - 110	W207035	13-Feb-12	D2,M3



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace Ste 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: **W2B0100**

Reported: 23-Feb-12 10:43

Quality Control - MATRIX SPIKE DUPLICATE Data

Method	Analyte	Units	MSD Result	Spike Result	Spike Level	RPD	RPD Limit	Batch ID	Analyzed	Notes
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Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	mg/L	0.099	0.097	0.100	1.1	20	W206262	10-Feb-12	
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Notes and Definitions

- D2 Sample required dilution due to high concentration of target analyte.
- D5 Sample required dilution to meet internal standard recovery limits.
- H1 Sample analysis performed past holding time.
- H3 Sample was received and analyzed past holding time.
- H5 This test is specified to be performed in the field within 15 minutes of sampling; sample was received and analyzed past the regulatory holding time.
- M1 Matrix spike recovery was high, but the LCS recovery was acceptable.
- M2 Matrix spike recovery was low, but the LCS recovery was acceptable.
- M3 The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to spike level. The LCS was acceptable.
- M4 The analysis of the spiked sample required a dilution such that the spike recovery calculation does not provide useful information. The LCS recovery was acceptable.
- N1 See case narrative.
- Q13 Sample was received and analyzed with pH>2.
- R1 RPD exceeded the method acceptance limit.
- R2 RPD exceeded the laboratory acceptance limit.
- LCS Laboratory Control Sample (Blank Spike)
- RPD Relative Percent Difference
- UDL A result is less than the detection limit
- R > 4S % recovery not applicable, sample concentration more than four times greater than spike level
- <RL A result is less than the reporting limit
- MRL Method Reporting Limit
- MDL Method Detection Limit
- N/A Not Applicable



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2C0061**
Reported: 21-Mar-12 10:08

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Sampled By	Date Received
24FEB12GW001	W2C0061-01	Ground Water	24-Feb-12 15:45	JW	05-Mar-2012
25FEB12GW002	W2C0061-02	Ground Water	25-Feb-12 12:00	JW	05-Mar-2012
25FEB12GW003	W2C0061-03	Ground Water	25-Feb-12 16:20	JW	05-Mar-2012
26FEB12GW004	W2C0061-04	Ground Water	26-Feb-12 10:40	JW	05-Mar-2012
26FEB12GW005	W2C0061-05	Ground Water	26-Feb-12 11:30	JW	05-Mar-2012
26FEB12GW006	W2C0061-06	Ground Water	26-Feb-12 16:40	JW	05-Mar-2012
27FEB12GW007	W2C0061-07	Ground Water	27-Feb-12 11:00	JW	05-Mar-2012
27FEB12GW008	W2C0061-08	Ground Water	27-Feb-12 15:45	JW	05-Mar-2012
28FEB12GW009	W2C0061-09	Ground Water	28-Feb-12 12:00	JW	05-Mar-2012
28FEB12GW109	W2C0061-10	Ground Water	28-Feb-12 12:00	JW	05-Mar-2012

Solid samples are analyzed on an as-received, wet-weight basis, unless otherwise requested. Non-Detects are reported at the MDL. Sample preparation is defined by the client as per their Data Quality Objectives. This report supercedes any previous reports for this Work Order. The complete report includes pages for each sample, a full QC report, and a notes section. The results presented in this report relate only to the samples, and meet all requirements of the NELAC Standards unless otherwise noted.

Case Narrative

03/12/12 DG Original result for sample W2C0061-08 for CN Free was 0.327mg/L. Suspected Sulfide interference due to <.01mg/L CN T 335.4 result. Sample was treated with CdCO3 and reanalyzed.



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2C0061**
Reported: 21-Mar-12 10:08

Client Sample ID: **24FEB12GW001**

SVL Sample ID: **W2C0061-01 (Ground Water)**

Sample Report Page 1 of 3

Sampled: 24-Feb-12 15:45
Received: 05-Mar-12
Sampled By: JW

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W210313	STA	03/12/12 11:13	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	0.158	mg/L	0.080	0.008		W210083	AS	03/19/12 16:28	
EPA 200.7	Barium	0.148	mg/L	0.0020	0.0002		W210083	AS	03/19/12 16:28	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W210083	AS	03/19/12 16:28	
EPA 200.7	Calcium	29.1	mg/L	0.040	0.006		W210083	AS	03/19/12 16:28	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0003		W210083	AS	03/19/12 16:28	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W210083	AS	03/19/12 16:28	
EPA 200.7	Iron	1.93	mg/L	0.060	0.008		W210083	AS	03/19/12 16:28	
EPA 200.7	Magnesium	8.88	mg/L	0.060	0.010		W210083	AS	03/19/12 16:28	
EPA 200.7	Manganese	2.61	mg/L	0.0040	0.0006		W210083	AS	03/19/12 16:28	
EPA 200.7	Molybdenum	0.029	mg/L	0.008	0.0006		W210083	AS	03/19/12 16:28	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W210083	AS	03/19/12 16:28	
EPA 200.7	Potassium	1.02	mg/L	0.50	0.03		W210083	AS	03/19/12 16:28	
EPA 200.7	Silicon	14.1	mg/L	0.08	0.01		W210083	AS	03/19/12 16:28	
EPA 200.7	Sodium	32.2	mg/L	0.50	0.02		W210083	AS	03/19/12 16:28	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0002		W210083	AS	03/19/12 16:28	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0002		W210083	AS	03/19/12 16:28	
EPA 200.7	Zinc	0.0264	mg/L	0.0100	0.0010		W210083	AS	03/19/12 16:28	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W210087	KWH	03/12/12 07:20	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W210087	KWH	03/12/12 07:20	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000096	2.5	W210087	KWH	03/12/12 07:20	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.00002	2.5	W210087	KWH	03/12/12 07:20	
EPA 200.8	Copper	0.00115	mg/L	0.00100	0.00009	2.5	W210087	KWH	03/12/12 07:20	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000016	2.5	W210087	KWH	03/12/12 07:20	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W210087	KWH	03/12/12 07:20	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.000009	2.5	W210087	KWH	03/12/12 07:20	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000004	2.5	W210087	KWH	03/12/12 07:20	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000006	2.5	W210087	KWH	03/12/12 07:20	
SM 2340B	Hardness (as CaCO3)	98.5	mg/L	0.347	0.116		N/A		03/20/12 10:18	



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2C0061**
Reported: 21-Mar-12 10:08

Client Sample ID: **24FEB12GW001**

SVL Sample ID: **W2C0061-01 (Ground Water)**

Sample Report Page 2 of 3

Sampled: 24-Feb-12 15:45
Received: 05-Mar-12
Sampled By: JW

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.016		W210080	DT	03/20/12 10:18	
EPA 200.7	Barium	0.139	mg/L	0.0020	0.0004		W210080	DT	03/20/12 10:18	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W210080	DT	03/20/12 10:18	
EPA 200.7	Calcium	26.6	mg/L	0.040	0.012		W210080	DT	03/20/12 10:18	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W210080	DT	03/20/12 10:18	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W210080	DT	03/20/12 10:18	
EPA 200.7	Iron	1.13	mg/L	0.060	0.017		W210080	DT	03/20/12 10:18	
EPA 200.7	Magnesium	7.81	mg/L	0.060	0.021		W210080	DT	03/20/12 10:18	
EPA 200.7	Manganese	2.36	mg/L	0.0040	0.0011		W210080	DT	03/20/12 10:18	
EPA 200.7	Molybdenum	0.029	mg/L	0.008	0.001		W210080	DT	03/20/12 10:18	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W210080	DT	03/20/12 10:18	
EPA 200.7	Potassium	0.85	mg/L	0.50	0.07		W210080	DT	03/20/12 10:18	
EPA 200.7	Silicon	13.2	mg/L	0.08	0.03		W210080	DT	03/20/12 10:18	
EPA 200.7	Sodium	28.7	mg/L	0.50	0.04		W210080	DT	03/20/12 10:18	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W210080	DT	03/20/12 10:18	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W210080	DT	03/20/12 10:18	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0021		W210080	DT	03/20/12 10:18	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W210089	KWH	03/14/12 08:05	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W210089	KWH	03/14/12 08:05	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000077		W210089	KWH	03/14/12 08:05	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.000013		W210089	KWH	03/14/12 08:05	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.000072		W210089	KWH	03/14/12 08:05	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000013		W210089	KWH	03/14/12 08:05	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W210089	KWH	03/14/12 08:05	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.0000074		W210089	KWH	03/14/12 08:38	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000033		W210089	KWH	03/14/12 08:05	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000049		W210089	KWH	03/14/12 08:05	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W210183	STA	03/08/12 12:52	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0005		W210178	IIT	03/07/12 13:26	
EPA 120.1	Specific conductance	323	µmhos/cm	5.00			W210075	RS	03/05/12 17:06	
EPA 180.1	Turbidity	12.7	NTU	0.100			W210111	SM	03/06/12 12:39	H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W210228	IIT	03/09/12 13:01	
EPA 350.1	Ammonia as N	0.075	mg/L	0.030	0.006		W211199	RHW	03/19/12 13:35	
EPA 353.2	Nitrate/Nitrite as N	< 0.050	mg/L	0.050	0.009		W211257	RHW	03/19/12 11:26	
SM 2320B/2310B	Bicarbonate	175	mg/L	1.0	0.1		W210074	AGF	03/06/12 11:44	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.1		W210074	AGF	03/06/12 11:44	
SM 2320B/2310B	Total Alkalinity	175	mg/L	1.0	0.1		W210074	AGF	03/06/12 11:44	
SM 2540 C	Total Diss. Solids	208	mg/L	10			W210078	RS	03/05/12 17:30	H3
SM 2540 D	Total Susp. Solids	18.0	mg/L	5.0			W210076	RS	03/05/12 17:30	H3
SM 4500 H B	pH @23.0°C	7.72	pH Units				W210074	AGF	03/06/12 11:44	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W210289	IIT	03/09/12 12:03	
SM 4500-P-E	Phosphorus	0.051	mg/L	0.010	0.003		W210252	SM	03/08/12 14:31	



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Kellogg ID 83837-0929

(208) 784-1258

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Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: **W2C0061**

Reported: 21-Mar-12 10:08

Client Sample ID: **24FEB12GW001**

SVL Sample ID: **W2C0061-01 (Ground Water)**

Sample Report Page 3 of 3

Sampled: 24-Feb-12 15:45

Received: 05-Mar-12

Sampled By: JW

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	6.26	mg/L	0.20	0.07		W211069	AEW	03/12/12 17:58	
EPA 300.0	Fluoride	0.18	mg/L	0.10	0.02		W211069	AEW	03/12/12 17:58	
EPA 300.0	Sulfate as SO4	0.83	mg/L	0.30	0.04		W211069	AEW	03/12/12 17:58	

Cation/Anion Balance and TDS Ratios

Cation Sum: 3.38 meq/L Anion Sum: 3.70 meq/L C/A Balance: -4.59 % Calculated TDS: 217 TDS/cTDS: 0.96 TDS/eC: 0.64

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Kirby Gray
Technical Director



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2C0061**
Reported: 21-Mar-12 10:08

Client Sample ID: **25FEB12GW002**

SVL Sample ID: **W2C0061-02 (Ground Water)**

Sample Report Page 1 of 3

Sampled: 25-Feb-12 12:00
Received: 05-Mar-12
Sampled By: JW

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W210313	STA	03/12/12 11:15	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.008		W210083	AS	03/19/12 16:47	
EPA 200.7	Barium	0.0274	mg/L	0.0020	0.0002		W210083	AS	03/19/12 16:47	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W210083	AS	03/19/12 16:47	
EPA 200.7	Calcium	33.9	mg/L	0.040	0.006		W210083	AS	03/19/12 16:47	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0003		W210083	AS	03/19/12 16:47	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W210083	AS	03/19/12 16:47	
EPA 200.7	Iron	1.01	mg/L	0.060	0.008		W210083	AS	03/19/12 16:47	
EPA 200.7	Magnesium	18.0	mg/L	0.060	0.010		W210083	AS	03/19/12 16:47	
EPA 200.7	Manganese	0.675	mg/L	0.0040	0.0006		W210083	AS	03/19/12 16:47	
EPA 200.7	Molybdenum	0.011	mg/L	0.008	0.0006		W210083	AS	03/19/12 16:47	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W210083	AS	03/19/12 16:47	
EPA 200.7	Potassium	0.75	mg/L	0.50	0.03		W210083	AS	03/19/12 16:47	
EPA 200.7	Silicon	29.9	mg/L	0.08	0.01		W210083	AS	03/19/12 16:47	
EPA 200.7	Sodium	22.4	mg/L	0.50	0.02		W210083	AS	03/19/12 16:47	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0002		W210083	AS	03/19/12 16:47	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0002		W210083	AS	03/19/12 16:47	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0010		W210083	AS	03/19/12 16:47	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W210087	KWH	03/12/12 07:29	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W210087	KWH	03/12/12 07:29	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000096	2.5	W210087	KWH	03/12/12 07:29	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.00002	2.5	W210087	KWH	03/12/12 07:29	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.00009	2.5	W210087	KWH	03/12/12 07:29	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000016	2.5	W210087	KWH	03/12/12 07:29	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W210087	KWH	03/12/12 07:29	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.000009	2.5	W210087	KWH	03/12/12 07:29	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000004	2.5	W210087	KWH	03/12/12 07:29	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000006	2.5	W210087	KWH	03/12/12 07:29	
SM 2340B	Hardness (as CaCO3)	153	mg/L	0.347	0.116		N/A		03/20/12 10:35	



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2C0061**
Reported: 21-Mar-12 10:08

Client Sample ID: **25FEB12GW002**

SVL Sample ID: **W2C0061-02 (Ground Water)**

Sample Report Page 2 of 3

Sampled: 25-Feb-12 12:00
Received: 05-Mar-12
Sampled By: JW

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.016		W210080	DT	03/20/12 10:35	
EPA 200.7	Barium	0.0276	mg/L	0.0020	0.0004		W210080	DT	03/20/12 10:35	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W210080	DT	03/20/12 10:35	
EPA 200.7	Calcium	32.7	mg/L	0.040	0.012		W210080	DT	03/20/12 10:35	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W210080	DT	03/20/12 10:35	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W210080	DT	03/20/12 10:35	
EPA 200.7	Iron	0.892	mg/L	0.060	0.017		W210080	DT	03/20/12 10:35	
EPA 200.7	Magnesium	17.3	mg/L	0.060	0.021		W210080	DT	03/20/12 10:35	
EPA 200.7	Manganese	0.665	mg/L	0.0040	0.0011		W210080	DT	03/20/12 10:35	
EPA 200.7	Molybdenum	0.013	mg/L	0.008	0.001		W210080	DT	03/20/12 10:35	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W210080	DT	03/20/12 10:35	
EPA 200.7	Potassium	0.69	mg/L	0.50	0.07		W210080	DT	03/20/12 10:35	
EPA 200.7	Silicon	30.3	mg/L	0.08	0.03		W210080	DT	03/20/12 10:35	
EPA 200.7	Sodium	21.2	mg/L	0.50	0.04		W210080	DT	03/20/12 10:35	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W210080	DT	03/20/12 10:35	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W210080	DT	03/20/12 10:35	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0021		W210080	DT	03/20/12 10:35	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W210089	KWH	03/14/12 08:17	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W210089	KWH	03/14/12 08:17	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000077		W210089	KWH	03/14/12 08:17	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.000013		W210089	KWH	03/14/12 08:17	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.000072		W210089	KWH	03/14/12 08:17	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000013		W210089	KWH	03/14/12 08:17	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W210089	KWH	03/14/12 08:17	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.0000074		W210089	KWH	03/14/12 08:43	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000033		W210089	KWH	03/14/12 08:17	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000049		W210089	KWH	03/14/12 08:17	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W210183	STA	03/08/12 12:57	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0005		W210178	IIT	03/07/12 13:28	
EPA 120.1	Specific conductance	363	µmhos/cm	5.00			W210075	RS	03/05/12 17:06	
EPA 180.1	Turbidity	10.9	NTU	0.100			W210111	SM	03/06/12 12:39	H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W210228	IIT	03/09/12 13:03	
EPA 350.1	Ammonia as N	< 0.030	mg/L	0.030	0.006		W211199	RHW	03/19/12 13:43	
EPA 353.2	Nitrate/Nitrite as N	< 0.050	mg/L	0.050	0.009		W211257	RHW	03/19/12 11:28	
SM 2320B/2310B	Bicarbonate	203	mg/L	1.0	0.1		W210074	AGF	03/06/12 11:51	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.1		W210074	AGF	03/06/12 11:51	
SM 2320B/2310B	Total Alkalinity	203	mg/L	1.0	0.1		W210074	AGF	03/06/12 11:51	
SM 2540 C	Total Diss. Solids	261	mg/L	10			W210078	RS	03/05/12 17:30	H3
SM 2540 D	Total Susp. Solids	14.0	mg/L	5.0			W210076	RS	03/05/12 17:30	H3
SM 4500 H B	pH @23.0°C	7.67	pH Units				W210074	AGF	03/06/12 11:51	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W210289	IIT	03/09/12 12:05	
SM 4500-P-E	Phosphorus	0.130	mg/L	0.010	0.003		W210252	SM	03/08/12 14:31	



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Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: **W2C0061**

Reported: 21-Mar-12 10:08

Client Sample ID: **25FEB12GW002**

SVL Sample ID: **W2C0061-02 (Ground Water)**

Sample Report Page 3 of 3

Sampled: 25-Feb-12 12:00

Received: 05-Mar-12

Sampled By: JW

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	5.59	mg/L	0.20	0.07		W211069	AEW	03/12/12 18:21	
EPA 300.0	Fluoride	0.19	mg/L	0.10	0.02		W211069	AEW	03/12/12 18:21	
EPA 300.0	Sulfate as SO4	0.66	mg/L	0.30	0.04		W211069	AEW	03/12/12 18:21	

Cation/Anion Balance and TDS Ratios

Cation Sum: 4.05 meq/L Anion Sum: 4.24 meq/L C/A Balance: -2.23 % Calculated TDS: 283 TDS/cTDS: 0.92 TDS/eC: 0.72

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Kirby Gray
Technical Director



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2C0061**
Reported: 21-Mar-12 10:08

Client Sample ID: **25FEB12GW003**

SVL Sample ID: **W2C0061-03 (Ground Water)**

Sample Report Page 1 of 3

Sampled: 25-Feb-12 16:20
Received: 05-Mar-12
Sampled By: JW

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W210313	STA	03/12/12 10:15	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.008		W210083	AS	03/19/12 16:59	
EPA 200.7	Barium	0.0242	mg/L	0.0020	0.0002		W210083	AS	03/19/12 16:59	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W210083	AS	03/19/12 16:59	
EPA 200.7	Calcium	14.9	mg/L	0.040	0.006		W210083	AS	03/19/12 16:59	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0003		W210083	AS	03/19/12 16:59	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W210083	AS	03/19/12 16:59	
EPA 200.7	Iron	2.19	mg/L	0.060	0.008		W210083	AS	03/19/12 16:59	
EPA 200.7	Magnesium	9.13	mg/L	0.060	0.010		W210083	AS	03/19/12 16:59	
EPA 200.7	Manganese	0.583	mg/L	0.0040	0.0006		W210083	AS	03/19/12 16:59	
EPA 200.7	Molybdenum	0.017	mg/L	0.008	0.0006		W210083	AS	03/19/12 16:59	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W210083	AS	03/19/12 16:59	
EPA 200.7	Potassium	0.83	mg/L	0.50	0.03		W210083	AS	03/19/12 16:59	
EPA 200.7	Silicon	34.6	mg/L	0.08	0.01		W210083	AS	03/19/12 16:59	
EPA 200.7	Sodium	23.4	mg/L	0.50	0.02		W210083	AS	03/19/12 16:59	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0002		W210083	AS	03/19/12 16:59	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0002		W210083	AS	03/19/12 16:59	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0010		W210083	AS	03/19/12 16:59	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W210087	KWH	03/12/12 07:30	
EPA 200.8	Arsenic	0.0032	mg/L	0.0030	0.0003	2.5	W210087	KWH	03/12/12 07:30	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000096	2.5	W210087	KWH	03/12/12 07:30	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.00002	2.5	W210087	KWH	03/12/12 07:30	
EPA 200.8	Copper	0.00108	mg/L	0.00100	0.00009	2.5	W210087	KWH	03/12/12 07:30	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000016	2.5	W210087	KWH	03/12/12 07:30	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W210087	KWH	03/12/12 07:30	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.000009	2.5	W210087	KWH	03/12/12 07:30	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000004	2.5	W210087	KWH	03/12/12 07:30	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000006	2.5	W210087	KWH	03/12/12 07:30	
SM 2340B	Hardness (as CaCO3)	69.4	mg/L	0.347	0.116		N/A		03/20/12 10:46	



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2C0061**
Reported: 21-Mar-12 10:08

Client Sample ID: **25FEB12GW003**

SVL Sample ID: **W2C0061-03 (Ground Water)**

Sample Report Page 2 of 3

Sampled: 25-Feb-12 16:20
Received: 05-Mar-12
Sampled By: JW

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.016		W210080	DT	03/20/12 10:46	
EPA 200.7	Barium	0.0235	mg/L	0.0020	0.0004		W210080	DT	03/20/12 10:46	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W210080	DT	03/20/12 10:46	
EPA 200.7	Calcium	14.0	mg/L	0.040	0.012		W210080	DT	03/20/12 10:46	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W210080	DT	03/20/12 10:46	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W210080	DT	03/20/12 10:46	
EPA 200.7	Iron	1.87	mg/L	0.060	0.017		W210080	DT	03/20/12 10:46	
EPA 200.7	Magnesium	8.36	mg/L	0.060	0.021		W210080	DT	03/20/12 10:46	
EPA 200.7	Manganese	0.552	mg/L	0.0040	0.0011		W210080	DT	03/20/12 10:46	
EPA 200.7	Molybdenum	0.017	mg/L	0.008	0.001		W210080	DT	03/20/12 10:46	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W210080	DT	03/20/12 10:46	
EPA 200.7	Potassium	0.78	mg/L	0.50	0.07		W210080	DT	03/20/12 10:46	
EPA 200.7	Silicon	33.5	mg/L	0.08	0.03		W210080	DT	03/20/12 10:46	
EPA 200.7	Sodium	21.8	mg/L	0.50	0.04		W210080	DT	03/20/12 10:46	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W210080	DT	03/20/12 10:46	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W210080	DT	03/20/12 10:46	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0021		W210080	DT	03/20/12 10:46	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W210089	KWH	03/14/12 08:21	
EPA 200.8	Arsenic	0.0030	mg/L	0.0030	0.0002		W210089	KWH	03/14/12 08:21	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000077		W210089	KWH	03/14/12 08:21	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.000013		W210089	KWH	03/14/12 08:21	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.000072		W210089	KWH	03/14/12 08:21	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000013		W210089	KWH	03/14/12 08:21	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W210089	KWH	03/14/12 08:21	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.0000074		W210089	KWH	03/14/12 08:45	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000033		W210089	KWH	03/14/12 08:21	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000049		W210089	KWH	03/14/12 08:21	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W210312	STA	03/12/12 10:15	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0005		W210178	IIT	03/07/12 13:30	
EPA 120.1	Specific conductance	227	µmhos/cm	5.00			W210075	RS	03/05/12 17:06	
EPA 180.1	Turbidity	5.00	NTU	0.100			W210111	SM	03/06/12 12:39	H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W210228	IIT	03/09/12 13:05	
EPA 350.1	Ammonia as N	0.064	mg/L	0.030	0.006		W211199	RHW	03/19/12 13:44	
EPA 353.2	Nitrate/Nitrite as N	< 0.050	mg/L	0.050	0.009		W211257	RHW	03/19/12 11:29	
SM 2320B/2310B	Bicarbonate	112	mg/L	1.0	0.1		W210074	AGF	03/06/12 11:58	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.1		W210074	AGF	03/06/12 11:58	
SM 2320B/2310B	Total Alkalinity	112	mg/L	1.0	0.1		W210074	AGF	03/06/12 11:58	
SM 2540 C	Total Diss. Solids	185	mg/L	10			W210078	RS	03/05/12 17:30	H3
SM 2540 D	Total Susp. Solids	10.0	mg/L	5.0			W210076	RS	03/05/12 17:30	H3
SM 4500 H B	pH @23.0°C	7.26	pH Units				W210074	AGF	03/06/12 11:58	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W210289	IIT	03/09/12 12:07	
SM 4500-P-E	Phosphorus	0.345	mg/L	0.010	0.003		W210252	SM	03/08/12 14:31	



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Kellogg ID 83837-0929

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Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: **W2C0061**

Reported: 21-Mar-12 10:08

Client Sample ID: **25FEB12GW003**

SVL Sample ID: **W2C0061-03 (Ground Water)**

Sample Report Page 3 of 3

Sampled: 25-Feb-12 16:20

Received: 05-Mar-12

Sampled By: JW

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	9.90	mg/L	0.20	0.07		W211069	AEW	03/12/12 19:07	
EPA 300.0	Fluoride	0.28	mg/L	0.10	0.02		W211069	AEW	03/12/12 19:07	
EPA 300.0	Sulfate as SO4	1.00	mg/L	0.30	0.04		W211069	AEW	03/12/12 19:07	

Cation/Anion Balance and TDS Ratios

Cation Sum: 2.45 meq/L Anion Sum: 2.55 meq/L C/A Balance: -2.11 % Calculated TDS: 217 TDS/cTDS: 0.85 TDS/eC: 0.81

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Kirby Gray
Technical Director



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: **Suriname Merian 2012 / 113-93245**

Work Order: **W2C0061**

Reported: 21-Mar-12 10:08

Client Sample ID: **26FEB12GW004**

SVL Sample ID: **W2C0061-04 (Ground Water)**

Sample Report Page 1 of 3

Sampled: 26-Feb-12 10:40

Received: 05-Mar-12

Sampled By: JW

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total)										
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W210313	STA	03/12/12 10:16	
Metals (Total Recoverable--reportable as Total per 40 CFR 136)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.008		W210083	AS	03/19/12 17:05	
EPA 200.7	Barium	0.0085	mg/L	0.0020	0.0002		W210083	AS	03/19/12 17:05	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W210083	AS	03/19/12 17:05	
EPA 200.7	Calcium	0.998	mg/L	0.040	0.006		W210083	AS	03/19/12 17:05	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0003		W210083	AS	03/19/12 17:05	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W210083	AS	03/19/12 17:05	
EPA 200.7	Iron	0.249	mg/L	0.060	0.008		W210083	AS	03/19/12 17:05	
EPA 200.7	Magnesium	2.18	mg/L	0.060	0.010		W210083	AS	03/19/12 17:05	
EPA 200.7	Manganese	0.0396	mg/L	0.0040	0.0006		W210083	AS	03/19/12 17:05	
EPA 200.7	Molybdenum	0.008	mg/L	0.008	0.0006		W210083	AS	03/19/12 17:05	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W210083	AS	03/19/12 17:05	
EPA 200.7	Potassium	< 0.50	mg/L	0.50	0.03		W210083	AS	03/19/12 17:05	
EPA 200.7	Silicon	9.21	mg/L	0.08	0.01		W210083	AS	03/19/12 17:05	
EPA 200.7	Sodium	4.12	mg/L	0.50	0.02		W210083	AS	03/19/12 17:05	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0002		W210083	AS	03/19/12 17:05	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0002		W210083	AS	03/19/12 17:05	
EPA 200.7	Zinc	0.204	mg/L	0.0100	0.0010		W210083	AS	03/19/12 17:05	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W210087	KWH	03/12/12 07:32	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W210087	KWH	03/12/12 07:32	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000096	2.5	W210087	KWH	03/12/12 07:32	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.00002	2.5	W210087	KWH	03/12/12 07:32	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.00009	2.5	W210087	KWH	03/12/12 07:32	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000016	2.5	W210087	KWH	03/12/12 07:32	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W210087	KWH	03/12/12 07:32	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.000009	2.5	W210087	KWH	03/12/12 07:32	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000004	2.5	W210087	KWH	03/12/12 07:32	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000006	2.5	W210087	KWH	03/12/12 07:32	
SM 2340B	Hardness (as CaCO3)	10.8	mg/L	0.347	0.116		N/A		03/20/12 10:52	



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2C0061**
Reported: 21-Mar-12 10:08

Client Sample ID: **26FEB12GW004**

SVL Sample ID: **W2C0061-04 (Ground Water)**

Sample Report Page 2 of 3

Sampled: 26-Feb-12 10:40
Received: 05-Mar-12
Sampled By: JW

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.016		W210080	DT	03/20/12 10:52	
EPA 200.7	Barium	0.0080	mg/L	0.0020	0.0004		W210080	DT	03/20/12 10:52	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W210080	DT	03/20/12 10:52	
EPA 200.7	Calcium	0.970	mg/L	0.040	0.012		W210080	DT	03/20/12 10:52	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W210080	DT	03/20/12 10:52	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W210080	DT	03/20/12 10:52	
EPA 200.7	Iron	< 0.060	mg/L	0.060	0.017		W210080	DT	03/20/12 10:52	
EPA 200.7	Magnesium	2.03	mg/L	0.060	0.021		W210080	DT	03/20/12 10:52	
EPA 200.7	Manganese	0.0387	mg/L	0.0040	0.0011		W210080	DT	03/20/12 10:52	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W210080	DT	03/20/12 10:52	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W210080	DT	03/20/12 10:52	
EPA 200.7	Potassium	< 0.50	mg/L	0.50	0.07		W210080	DT	03/20/12 10:52	
EPA 200.7	Silicon	8.82	mg/L	0.08	0.03		W210080	DT	03/20/12 10:52	
EPA 200.7	Sodium	3.88	mg/L	0.50	0.04		W210080	DT	03/20/12 10:52	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W210080	DT	03/20/12 10:52	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W210080	DT	03/20/12 10:52	
EPA 200.7	Zinc	0.196	mg/L	0.0100	0.0021		W210080	DT	03/20/12 10:52	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W210089	KWH	03/14/12 08:26	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W210089	KWH	03/14/12 08:26	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000077		W210089	KWH	03/14/12 08:26	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.000013		W210089	KWH	03/14/12 08:26	
EPA 200.8	Copper	0.00118	mg/L	0.00100	0.000072		W210089	KWH	03/14/12 08:26	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000013		W210089	KWH	03/14/12 08:26	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W210089	KWH	03/14/12 08:26	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.0000074		W210089	KWH	03/14/12 08:46	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000033		W210089	KWH	03/14/12 08:26	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000049		W210089	KWH	03/14/12 08:26	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W210312	STA	03/12/12 10:16	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0005		W210178	IIT	03/07/12 13:32	
EPA 120.1	Specific conductance	42.7	µmhos/cm	5.00			W210075	RS	03/05/12 17:06	
EPA 180.1	Turbidity	3.44	NTU	0.100			W210111	SM	03/06/12 12:39	H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W210228	IIT	03/09/12 13:07	
EPA 350.1	Ammonia as N	< 0.030	mg/L	0.030	0.006		W211199	RHW	03/19/12 13:45	
EPA 353.2	Nitrate/Nitrite as N	0.126	mg/L	0.050	0.009		W211257	RHW	03/19/12 11:31	
SM 2320B/2310B	Bicarbonate	12.8	mg/L	1.0	0.1		W210074	AGF	03/06/12 12:05	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.1		W210074	AGF	03/06/12 12:05	
SM 2320B/2310B	Total Alkalinity	12.8	mg/L	1.0	0.1		W210074	AGF	03/06/12 12:05	
SM 2540 C	Total Diss. Solids	32	mg/L	10			W210078	RS	03/05/12 17:30	H3
SM 2540 D	Total Susp. Solids	5.0	mg/L	5.0			W210076	RS	03/05/12 17:30	H3
SM 4500 H B	pH @23.0°C	6.08	pH Units				W210074	AGF	03/06/12 12:05	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W210289	IIT	03/09/12 12:09	
SM 4500-P-E	Phosphorus	< 0.010	mg/L	0.010	0.003		W210252	SM	03/08/12 14:31	



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Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: **W2C0061**

Reported: 21-Mar-12 10:08

Client Sample ID: **26FEB12GW004**

SVL Sample ID: **W2C0061-04 (Ground Water)**

Sample Report Page 3 of 3

Sampled: 26-Feb-12 10:40

Received: 05-Mar-12

Sampled By: JW

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	4.04	mg/L	0.20	0.07		W211069	AEW	03/12/12 19:29	
EPA 300.0	Fluoride	< 0.10	mg/L	0.10	0.02		W211069	AEW	03/12/12 19:29	
EPA 300.0	Sulfate as SO4	0.92	mg/L	0.30	0.04		W211069	AEW	03/12/12 19:29	

Cation/Anion Balance and TDS Ratios

Cation Sum: 0.39 meq/L Anion Sum: 0.40 meq/L C/A Balance: -0.57 % Calculated TDS: 45 TDS/cTDS: 0.72 TDS/eC: 0.75

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Kirby Gray
Technical Director



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2C0061**
Reported: 21-Mar-12 10:08

Client Sample ID: **26FEB12GW005**

SVL Sample ID: **W2C0061-05 (Ground Water)**

Sample Report Page 1 of 3

Sampled: 26-Feb-12 11:30
Received: 05-Mar-12
Sampled By: JW

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W210313	STA	03/12/12 10:18	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	0.153	mg/L	0.080	0.008		W210083	AS	03/19/12 17:11	
EPA 200.7	Barium	0.0072	mg/L	0.0020	0.0002		W210083	AS	03/19/12 17:11	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W210083	AS	03/19/12 17:11	
EPA 200.7	Calcium	0.435	mg/L	0.040	0.006		W210083	AS	03/19/12 17:11	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0003		W210083	AS	03/19/12 17:11	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W210083	AS	03/19/12 17:11	
EPA 200.7	Iron	0.313	mg/L	0.060	0.008		W210083	AS	03/19/12 17:11	
EPA 200.7	Magnesium	0.141	mg/L	0.060	0.010		W210083	AS	03/19/12 17:11	
EPA 200.7	Manganese	0.0459	mg/L	0.0040	0.0006		W210083	AS	03/19/12 17:11	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.0006		W210083	AS	03/19/12 17:11	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W210083	AS	03/19/12 17:11	
EPA 200.7	Potassium	0.88	mg/L	0.50	0.03		W210083	AS	03/19/12 17:11	
EPA 200.7	Silicon	12.1	mg/L	0.08	0.01		W210083	AS	03/19/12 17:11	
EPA 200.7	Sodium	14.9	mg/L	0.50	0.02		W210083	AS	03/19/12 17:11	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0002		W210083	AS	03/19/12 17:11	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0002		W210083	AS	03/19/12 17:11	
EPA 200.7	Zinc	0.0708	mg/L	0.0100	0.0010		W210083	AS	03/19/12 17:11	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W210087	KWH	03/12/12 07:34	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W210087	KWH	03/12/12 07:34	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000096	2.5	W210087	KWH	03/12/12 07:34	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.00002	2.5	W210087	KWH	03/12/12 07:34	
EPA 200.8	Copper	0.00116	mg/L	0.00100	0.00009	2.5	W210087	KWH	03/12/12 07:34	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000016	2.5	W210087	KWH	03/12/12 07:34	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W210087	KWH	03/12/12 07:34	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.000009	2.5	W210087	KWH	03/12/12 07:34	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000004	2.5	W210087	KWH	03/12/12 07:34	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000006	2.5	W210087	KWH	03/12/12 07:34	
SM 2340B	Hardness (as CaCO3)	1.55	mg/L	0.347	0.116		N/A		03/20/12 10:57	



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2C0061**
Reported: 21-Mar-12 10:08

Client Sample ID: **26FEB12GW005**

SVL Sample ID: **W2C0061-05 (Ground Water)**

Sample Report Page 2 of 3

Sampled: 26-Feb-12 11:30
Received: 05-Mar-12
Sampled By: JW

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	0.120	mg/L	0.080	0.016		W210080	DT	03/20/12 10:57	
EPA 200.7	Barium	0.0070	mg/L	0.0020	0.0004		W210080	DT	03/20/12 10:57	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W210080	DT	03/20/12 10:57	
EPA 200.7	Calcium	0.398	mg/L	0.040	0.012		W210080	DT	03/20/12 10:57	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W210080	DT	03/20/12 10:57	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W210080	DT	03/20/12 10:57	
EPA 200.7	Iron	0.291	mg/L	0.060	0.017		W210080	DT	03/20/12 10:57	
EPA 200.7	Magnesium	0.135	mg/L	0.060	0.021		W210080	DT	03/20/12 10:57	
EPA 200.7	Manganese	0.0435	mg/L	0.0040	0.0011		W210080	DT	03/20/12 10:57	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W210080	DT	03/20/12 10:57	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W210080	DT	03/20/12 10:57	
EPA 200.7	Potassium	0.82	mg/L	0.50	0.07		W210080	DT	03/20/12 10:57	
EPA 200.7	Silicon	11.6	mg/L	0.08	0.03		W210080	DT	03/20/12 10:57	
EPA 200.7	Sodium	14.3	mg/L	0.50	0.04		W210080	DT	03/20/12 10:57	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W210080	DT	03/20/12 10:57	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W210080	DT	03/20/12 10:57	
EPA 200.7	Zinc	0.0697	mg/L	0.0100	0.0021		W210080	DT	03/20/12 10:57	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W210089	KWH	03/14/12 08:30	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W210089	KWH	03/14/12 08:30	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000077		W210089	KWH	03/14/12 08:30	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.000013		W210089	KWH	03/14/12 08:30	
EPA 200.8	Copper	0.00102	mg/L	0.00100	0.000072		W210089	KWH	03/14/12 08:30	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000013		W210089	KWH	03/14/12 08:30	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W210089	KWH	03/14/12 08:30	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.0000074		W210089	KWH	03/14/12 08:48	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000033		W210089	KWH	03/14/12 08:30	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000049		W210089	KWH	03/14/12 08:30	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W210312	STA	03/12/12 10:18	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0005		W210178	IIT	03/07/12 15:17	
EPA 120.1	Specific conductance	70.9	µmhos/cm	5.00			W210075	RS	03/05/12 17:06	
EPA 180.1	Turbidity	0.446	NTU	0.100			W210111	SM	03/06/12 12:39	H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W210228	IIT	03/09/12 13:09	
EPA 350.1	Ammonia as N	0.039	mg/L	0.030	0.006		W211199	RHW	03/19/12 13:47	
EPA 353.2	Nitrate/Nitrite as N	0.211	mg/L	0.050	0.009		W211257	RHW	03/19/12 11:32	
SM 2320B/2310B	Bicarbonate	18.6	mg/L	1.0	0.1		W210074	AGF	03/06/12 12:18	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.1		W210074	AGF	03/06/12 12:18	
SM 2320B/2310B	Total Alkalinity	18.6	mg/L	1.0	0.1		W210074	AGF	03/06/12 12:18	
SM 2540 C	Total Diss. Solids	66	mg/L	10			W210078	RS	03/05/12 17:30	H3
SM 2540 D	Total Susp. Solids	< 5.0	mg/L	5.0			W210076	RS	03/05/12 17:30	H3
SM 4500 H B	pH @23.0°C	6.23	pH Units				W210074	AGF	03/06/12 12:18	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W210289	IIT	03/09/12 12:11	
SM 4500-P-E	Phosphorus	0.012	mg/L	0.010	0.003		W210252	SM	03/08/12 14:31	



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

(208) 784-1258

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Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: **W2C0061**

Reported: 21-Mar-12 10:08

Client Sample ID: **26FEB12GW005**

SVL Sample ID: **W2C0061-05 (Ground Water)**

Sample Report Page 3 of 3

Sampled: 26-Feb-12 11:30

Received: 05-Mar-12

Sampled By: JW

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	3.91	mg/L	0.20	0.07		W211069	AEW	03/12/12 19:41	
EPA 300.0	Fluoride	< 0.10	mg/L	0.10	0.02		W211069	AEW	03/12/12 19:41	
EPA 300.0	Sulfate as SO4	8.96	mg/L	0.30	0.04		W211069	AEW	03/12/12 19:41	

Cation/Anion Balance and TDS Ratios

Cation Sum: 0.70 meq/L Anion Sum: 0.68 meq/L C/A Balance: 1.41 % Calculated TDS: 73 TDS/cTDS: 0.90 TDS/eC: 0.93

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Kirby Gray
Technical Director



Tetra Tech EM, Inc. (Boise)
 3380 Americana Terrace, Suite 201
 Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
 Work Order: **W2C0061**
 Reported: 21-Mar-12 10:08

Client Sample ID: **26FEB12GW006**

SVL Sample ID: **W2C0061-06 (Ground Water)**

Sample Report Page 1 of 3

Sampled: 26-Feb-12 16:40
 Received: 05-Mar-12
 Sampled By: JW

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W210313	STA	03/12/12 10:19	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	1.15	mg/L	0.080	0.008		W210083	AS	03/19/12 17:29	
EPA 200.7	Barium	0.0178	mg/L	0.0020	0.0002		W210083	AS	03/19/12 17:29	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W210083	AS	03/19/12 17:29	
EPA 200.7	Calcium	4.55	mg/L	0.040	0.006		W210083	AS	03/19/12 17:29	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0003		W210083	AS	03/19/12 17:29	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W210083	AS	03/19/12 17:29	
EPA 200.7	Iron	2.20	mg/L	0.060	0.008		W210083	AS	03/19/12 17:29	
EPA 200.7	Magnesium	7.78	mg/L	0.060	0.010		W210083	AS	03/19/12 17:29	
EPA 200.7	Manganese	0.162	mg/L	0.0040	0.0006		W210083	AS	03/19/12 17:29	
EPA 200.7	Molybdenum	0.025	mg/L	0.008	0.0006		W210083	AS	03/19/12 17:29	
EPA 200.7	Nickel	0.010	mg/L	0.010	0.002		W210083	AS	03/19/12 17:29	
EPA 200.7	Potassium	1.23	mg/L	0.50	0.03		W210083	AS	03/19/12 17:29	
EPA 200.7	Silicon	24.9	mg/L	0.08	0.01		W210083	AS	03/19/12 17:29	
EPA 200.7	Sodium	22.6	mg/L	0.50	0.02		W210083	AS	03/19/12 17:29	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0002		W210083	AS	03/19/12 17:29	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0002		W210083	AS	03/19/12 17:29	
EPA 200.7	Zinc	0.0715	mg/L	0.0100	0.0010		W210083	AS	03/19/12 17:29	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W210087	KWH	03/12/12 07:36	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W210087	KWH	03/12/12 07:36	
EPA 200.8	Beryllium	< 0.000400	mg/L	0.000400	0.000192	5	W210087	KWH	03/12/12 09:09	D5
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.00002	2.5	W210087	KWH	03/12/12 07:36	
EPA 200.8	Copper	0.00223	mg/L	0.00100	0.00009	2.5	W210087	KWH	03/12/12 07:36	
EPA 200.8	Lead	0.00355	mg/L	0.00300	0.000016	2.5	W210087	KWH	03/12/12 07:36	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W210087	KWH	03/12/12 07:36	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.000009	2.5	W210087	KWH	03/12/12 07:36	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000004	2.5	W210087	KWH	03/12/12 07:36	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000006	2.5	W210087	KWH	03/12/12 07:36	
SM 2340B	Hardness (as CaCO3)	40.2	mg/L	0.347	0.116		N/A		03/20/12 11:03	



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: **W2C0061**

Reported: 21-Mar-12 10:08

Client Sample ID: **26FEB12GW006**

Sampled: 26-Feb-12 16:40

SVL Sample ID: **W2C0061-06 (Ground Water)**

Received: 05-Mar-12

Sample Report Page 2 of 3

Sampled By: JW

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Dissolved)

EPA 200.7	Aluminum	0.402	mg/L	0.080	0.016		W210080	DT	03/20/12 11:03	
EPA 200.7	Barium	0.0186	mg/L	0.0020	0.0004		W210080	DT	03/20/12 11:03	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W210080	DT	03/20/12 11:03	
EPA 200.7	Calcium	4.36	mg/L	0.040	0.012		W210080	DT	03/20/12 11:03	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W210080	DT	03/20/12 11:03	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W210080	DT	03/20/12 11:03	
EPA 200.7	Iron	1.29	mg/L	0.060	0.017		W210080	DT	03/20/12 11:03	
EPA 200.7	Magnesium	7.12	mg/L	0.060	0.021		W210080	DT	03/20/12 11:03	
EPA 200.7	Manganese	0.152	mg/L	0.0040	0.0011		W210080	DT	03/20/12 11:03	
EPA 200.7	Molybdenum	0.019	mg/L	0.008	0.001		W210080	DT	03/20/12 11:03	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W210080	DT	03/20/12 11:03	
EPA 200.7	Potassium	1.14	mg/L	0.50	0.07		W210080	DT	03/20/12 11:03	
EPA 200.7	Silicon	23.0	mg/L	0.08	0.03		W210080	DT	03/20/12 11:03	
EPA 200.7	Sodium	21.5	mg/L	0.50	0.04		W210080	DT	03/20/12 11:03	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W210080	DT	03/20/12 11:03	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W210080	DT	03/20/12 11:03	
EPA 200.7	Zinc	0.0557	mg/L	0.0100	0.0021		W210080	DT	03/20/12 11:03	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W210089	KWH	03/14/12 08:34	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W210089	KWH	03/14/12 08:34	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000077		W210089	KWH	03/14/12 08:34	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.000013		W210089	KWH	03/14/12 08:34	
EPA 200.8	Copper	0.00165	mg/L	0.00100	0.000072		W210089	KWH	03/14/12 08:34	
EPA 200.8	Lead	0.00353	mg/L	0.00300	0.000013		W210089	KWH	03/14/12 08:34	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W210089	KWH	03/14/12 08:34	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.0000074		W210089	KWH	03/14/12 08:50	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000033		W210089	KWH	03/14/12 08:34	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000049		W210089	KWH	03/14/12 08:34	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W210312	STA	03/12/12 10:19	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0005		W210178	IIT	03/07/12 15:19	
EPA 120.1	Specific conductance	170	µmhos/cm	5.00			W210075	RS	03/05/12 17:06	
EPA 180.1	Turbidity	36.3	NTU	0.100			W210111	SM	03/06/12 12:39	H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W210228	IIT	03/09/12 13:11	
EPA 350.1	Ammonia as N	0.133	mg/L	0.030	0.006		W211199	RHW	03/19/12 13:52	
EPA 353.2	Nitrate/Nitrite as N	< 0.050	mg/L	0.050	0.009		W211257	RHW	03/19/12 11:34	
SM 2320B/2310B	Bicarbonate	71.8	mg/L	1.0	0.1		W210074	AGF	03/06/12 12:27	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.1		W210074	AGF	03/06/12 12:27	
SM 2320B/2310B	Total Alkalinity	71.8	mg/L	1.0	0.1		W210074	AGF	03/06/12 12:27	
SM 2540 C	Total Diss. Solids	156	mg/L	10			W210078	RS	03/05/12 17:30	H3
SM 2540 D	Total Susp. Solids	106	mg/L	5.0			W210076	RS	03/05/12 17:30	H3
SM 4500 H B	pH @23.0°C	7.07	pH Units				W210074	AGF	03/06/12 12:27	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W210289	IIT	03/09/12 12:13	
SM 4500-P-E	Phosphorus	0.247	mg/L	0.010	0.003		W210252	SM	03/08/12 14:31	



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Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: **W2C0061**

Reported: 21-Mar-12 10:08

Client Sample ID: **26FEB12GW006**

SVL Sample ID: **W2C0061-06 (Ground Water)**

Sample Report Page 3 of 3

Sampled: 26-Feb-12 16:40

Received: 05-Mar-12

Sampled By: JW

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	7.17	mg/L	0.20	0.07		W211069	AEW	03/12/12 20:15	
EPA 300.0	Fluoride	0.24	mg/L	0.10	0.02		W211069	AEW	03/12/12 20:15	
EPA 300.0	Sulfate as SO4	9.94	mg/L	0.30	0.04		W211069	AEW	03/12/12 20:15	

Cation/Anion Balance and TDS Ratios

Cation Sum: 1.88 meq/L Anion Sum: 1.86 meq/L C/A Balance: 0.50 % Calculated TDS: 160 TDS/cTDS: 0.97 TDS/eC: 0.92

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Kirby Gray
Technical Director



Tetra Tech EM, Inc. (Boise)
 3380 Americana Terrace, Suite 201
 Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
 Work Order: **W2C0061**
 Reported: 21-Mar-12 10:08

Client Sample ID: **27FEB12GW007**

SVL Sample ID: **W2C0061-07 (Ground Water)**

Sample Report Page 1 of 3

Sampled: 27-Feb-12 11:00
 Received: 05-Mar-12
 Sampled By: JW

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W210313	STA	03/12/12 10:21	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	8.92	mg/L	0.080	0.008		W210083	AS	03/19/12 17:35	
EPA 200.7	Barium	0.0572	mg/L	0.0020	0.0002		W210083	AS	03/19/12 17:35	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W210083	AS	03/19/12 17:35	
EPA 200.7	Calcium	7.52	mg/L	0.040	0.006		W210083	AS	03/19/12 17:35	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0003		W210083	AS	03/19/12 17:35	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W210083	AS	03/19/12 17:35	
EPA 200.7	Iron	4.00	mg/L	0.060	0.008		W210083	AS	03/19/12 17:35	
EPA 200.7	Magnesium	2.49	mg/L	0.060	0.010		W210083	AS	03/19/12 17:35	
EPA 200.7	Manganese	0.189	mg/L	0.0040	0.0006		W210083	AS	03/19/12 17:35	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.0006		W210083	AS	03/19/12 17:35	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W210083	AS	03/19/12 17:35	
EPA 200.7	Potassium	2.53	mg/L	0.50	0.03		W210083	AS	03/19/12 17:35	
EPA 200.7	Silicon	26.8	mg/L	0.08	0.01		W210083	AS	03/19/12 17:35	
EPA 200.7	Sodium	35.0	mg/L	0.50	0.02		W210083	AS	03/19/12 17:35	
EPA 200.7	Titanium	0.0099	mg/L	0.0050	0.0002		W210083	AS	03/19/12 17:35	
EPA 200.7	Vanadium	0.0061	mg/L	0.0050	0.0002		W210083	AS	03/19/12 17:35	
EPA 200.7	Zinc	0.174	mg/L	0.0100	0.0010		W210083	AS	03/19/12 17:35	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W210087	KWH	03/12/12 07:38	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W210087	KWH	03/12/12 07:38	
EPA 200.8	Beryllium	0.00147	mg/L	0.000400	0.000192	5	W210087	KWH	03/12/12 09:11	D5
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.00002	2.5	W210087	KWH	03/12/12 07:38	
EPA 200.8	Copper	0.00567	mg/L	0.00100	0.00009	2.5	W210087	KWH	03/12/12 07:38	
EPA 200.8	Lead	0.00781	mg/L	0.00300	0.000016	2.5	W210087	KWH	03/12/12 07:38	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W210087	KWH	03/12/12 07:38	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.000009	2.5	W210087	KWH	03/12/12 07:38	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000004	2.5	W210087	KWH	03/12/12 07:38	
EPA 200.8	Uranium	0.00265	mg/L	0.00100	0.000006	2.5	W210087	KWH	03/12/12 07:38	
SM 2340B	Hardness (as CaCO3)	5.09	mg/L	0.347	0.116		N/A		03/20/12 11:08	



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2C0061**
Reported: 21-Mar-12 10:08

Client Sample ID: **27FEB12GW007**

SVL Sample ID: **W2C0061-07 (Ground Water)**

Sample Report Page 2 of 3

Sampled: 27-Feb-12 11:00
Received: 05-Mar-12
Sampled By: JW

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.016		W210080	DT	03/20/12 11:08	
EPA 200.7	Barium	0.0069	mg/L	0.0020	0.0004		W210080	DT	03/20/12 11:08	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W210080	DT	03/20/12 11:08	
EPA 200.7	Calcium	1.64	mg/L	0.040	0.012		W210080	DT	03/20/12 11:08	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W210080	DT	03/20/12 11:08	
EPA 200.7	Cobalt	0.0086	mg/L	0.0060	0.0009		W210080	DT	03/20/12 11:08	
EPA 200.7	Iron	0.283	mg/L	0.060	0.017		W210080	DT	03/20/12 11:08	
EPA 200.7	Magnesium	0.241	mg/L	0.060	0.021		W210080	DT	03/20/12 11:08	
EPA 200.7	Manganese	0.0516	mg/L	0.0040	0.0011		W210080	DT	03/20/12 11:08	
EPA 200.7	Molybdenum	0.010	mg/L	0.008	0.001		W210080	DT	03/20/12 11:08	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W210080	DT	03/20/12 11:08	
EPA 200.7	Potassium	1.46	mg/L	0.50	0.07		W210080	DT	03/20/12 11:08	
EPA 200.7	Silicon	7.50	mg/L	0.08	0.03		W210080	DT	03/20/12 11:08	
EPA 200.7	Sodium	30.8	mg/L	0.50	0.04		W210080	DT	03/20/12 11:08	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W210080	DT	03/20/12 11:08	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W210080	DT	03/20/12 11:08	
EPA 200.7	Zinc	0.0312	mg/L	0.0100	0.0021		W210080	DT	03/20/12 11:08	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W210089	KWH	03/14/12 08:47	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W210089	KWH	03/14/12 08:47	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000077		W210089	KWH	03/14/12 08:47	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.000013		W210089	KWH	03/14/12 08:47	
EPA 200.8	Copper	0.00109	mg/L	0.00100	0.000072		W210089	KWH	03/14/12 08:47	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000013		W210089	KWH	03/14/12 08:47	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W210089	KWH	03/14/12 08:47	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.0000074		W210089	KWH	03/14/12 08:54	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000033		W210089	KWH	03/14/12 08:47	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000049		W210089	KWH	03/14/12 08:47	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W210312	STA	03/12/12 10:21	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0005		W210178	IIT	03/07/12 15:21	
EPA 120.1	Specific conductance	156	µmhos/cm	5.00			W210075	RS	03/05/12 17:06	
EPA 180.1	Turbidity	175	NTU	0.500		5	W210111	SM	03/06/12 12:39	D2,H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W210228	IIT	03/09/12 13:13	
EPA 350.1	Ammonia as N	0.479	mg/L	0.030	0.006		W211199	RHW	03/19/12 13:53	
EPA 353.2	Nitrate/Nitrite as N	< 0.050	mg/L	0.050	0.009		W211257	RHW	03/19/12 11:35	
SM 2320B/2310B	Bicarbonate	66.9	mg/L	1.0	0.1		W210074	AGF	03/06/12 12:34	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.1		W210074	AGF	03/06/12 12:34	
SM 2320B/2310B	Total Alkalinity	66.9	mg/L	1.0	0.1		W210074	AGF	03/06/12 12:34	
SM 2540 C	Total Diss. Solids	140	mg/L	40			W210078	RS	03/05/12 17:30	
SM 2540 D	Total Susp. Solids	420	mg/L	20.0			W210076	RS	03/05/12 17:30	
SM 4500 H B	pH @23.0°C	7.06	pH Units				W210074	AGF	03/06/12 12:34	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W210289	IIT	03/09/12 12:15	
SM 4500-P-E	Phosphorus	0.016	mg/L	0.010	0.003		W210252	SM	03/08/12 14:31	



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

(208) 784-1258

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Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: **W2C0061**

Reported: 21-Mar-12 10:08

Client Sample ID: **27FEB12GW007**

SVL Sample ID: **W2C0061-07 (Ground Water)**

Sample Report Page 3 of 3

Sampled: 27-Feb-12 11:00

Received: 05-Mar-12

Sampled By: JW

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	5.13	mg/L	0.20	0.07		W211069	AEW	03/12/12 20:27	
EPA 300.0	Fluoride	0.17	mg/L	0.10	0.02		W211069	AEW	03/12/12 20:27	
EPA 300.0	Sulfate as SO4	10.1	mg/L	0.30	0.04		W211069	AEW	03/12/12 20:27	

Cation/Anion Balance and TDS Ratios

Cation Sum: 1.53 meq/L Anion Sum: 1.70 meq/L C/A Balance: -5.37 % Calculated TDS: 143 TDS/cTDS: 0.98 TDS/eC: 0.90

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Kirby Gray
Technical Director



Tetra Tech EM, Inc. (Boise)
 3380 Americana Terrace, Suite 201
 Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
 Work Order: **W2C0061**
 Reported: 21-Mar-12 10:08

Client Sample ID: **27FEB12GW008**

SVL Sample ID: **W2C0061-08 (Ground Water)**

Sample Report Page 1 of 3

Sampled: 27-Feb-12 15:45
 Received: 05-Mar-12
 Sampled By: JW

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total)										
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W210313	STA	03/12/12 10:26	
Metals (Total Recoverable--reportable as Total per 40 CFR 136)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.008		W210083	AS	03/19/12 17:41	
EPA 200.7	Barium	0.0317	mg/L	0.0020	0.0002		W210083	AS	03/19/12 17:41	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W210083	AS	03/19/12 17:41	
EPA 200.7	Calcium	40.1	mg/L	0.040	0.006		W210083	AS	03/19/12 17:41	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0003		W210083	AS	03/19/12 17:41	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W210083	AS	03/19/12 17:41	
EPA 200.7	Iron	0.500	mg/L	0.060	0.008		W210083	AS	03/19/12 17:41	
EPA 200.7	Magnesium	15.9	mg/L	0.060	0.010		W210083	AS	03/19/12 17:41	
EPA 200.7	Manganese	0.599	mg/L	0.0040	0.0006		W210083	AS	03/19/12 17:41	
EPA 200.7	Molybdenum	0.013	mg/L	0.008	0.0006		W210083	AS	03/19/12 17:41	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W210083	AS	03/19/12 17:41	
EPA 200.7	Potassium	2.52	mg/L	0.50	0.03		W210083	AS	03/19/12 17:41	
EPA 200.7	Silicon	21.4	mg/L	0.08	0.01		W210083	AS	03/19/12 17:41	
EPA 200.7	Sodium	38.7	mg/L	0.50	0.02		W210083	AS	03/19/12 17:41	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0002		W210083	AS	03/19/12 17:41	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0002		W210083	AS	03/19/12 17:41	
EPA 200.7	Zinc	0.0819	mg/L	0.0100	0.0010		W210083	AS	03/19/12 17:41	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W210087	KWH	03/12/12 07:40	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W210087	KWH	03/12/12 07:40	
EPA 200.8	Beryllium	< 0.000400	mg/L	0.000400	0.000192	5	W210087	KWH	03/12/12 09:12	D5
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.00002	2.5	W210087	KWH	03/12/12 07:40	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.00009	2.5	W210087	KWH	03/12/12 07:40	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000016	2.5	W210087	KWH	03/12/12 07:40	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W210087	KWH	03/12/12 07:40	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.000009	2.5	W210087	KWH	03/12/12 07:40	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000004	2.5	W210087	KWH	03/12/12 07:40	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000006	2.5	W210087	KWH	03/12/12 07:40	
SM 2340B	Hardness (as CaCO3)	148	mg/L	0.347	0.116		N/A		03/20/12 11:14	



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2C0061**
Reported: 21-Mar-12 10:08

Client Sample ID: **27FEB12GW008**

SVL Sample ID: **W2C0061-08 (Ground Water)**

Sample Report Page 2 of 3

Sampled: 27-Feb-12 15:45
Received: 05-Mar-12
Sampled By: JW

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.016		W210080	DT	03/20/12 11:14	
EPA 200.7	Barium	0.0301	mg/L	0.0020	0.0004		W210080	DT	03/20/12 11:14	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W210080	DT	03/20/12 11:14	
EPA 200.7	Calcium	35.9	mg/L	0.040	0.012		W210080	DT	03/20/12 11:14	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W210080	DT	03/20/12 11:14	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W210080	DT	03/20/12 11:14	
EPA 200.7	Iron	0.405	mg/L	0.060	0.017		W210080	DT	03/20/12 11:14	
EPA 200.7	Magnesium	14.2	mg/L	0.060	0.021		W210080	DT	03/20/12 11:14	
EPA 200.7	Manganese	0.547	mg/L	0.0040	0.0011		W210080	DT	03/20/12 11:14	
EPA 200.7	Molybdenum	0.015	mg/L	0.008	0.001		W210080	DT	03/20/12 11:14	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W210080	DT	03/20/12 11:14	
EPA 200.7	Potassium	2.28	mg/L	0.50	0.07		W210080	DT	03/20/12 11:14	
EPA 200.7	Silicon	19.9	mg/L	0.08	0.03		W210080	DT	03/20/12 11:14	
EPA 200.7	Sodium	35.9	mg/L	0.50	0.04		W210080	DT	03/20/12 11:14	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W210080	DT	03/20/12 11:14	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W210080	DT	03/20/12 11:14	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0021		W210080	DT	03/20/12 11:14	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W210089	KWH	03/14/12 08:51	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W210089	KWH	03/14/12 08:51	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000077		W210089	KWH	03/14/12 08:51	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.000013		W210089	KWH	03/14/12 08:51	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.000072		W210089	KWH	03/14/12 08:51	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000013		W210089	KWH	03/14/12 08:51	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W210089	KWH	03/14/12 08:51	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.0000074		W210089	KWH	03/14/12 08:56	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000033		W210089	KWH	03/14/12 08:51	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000049		W210089	KWH	03/14/12 08:51	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W210312	STA	03/12/12 10:26	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0005		W210309	IIT	03/09/12 14:08	N1
EPA 120.1	Specific conductance	434	µmhos/cm	5.00			W210075	RS	03/05/12 17:06	
EPA 180.1	Turbidity	4.86	NTU	0.100			W210111	SM	03/06/12 12:39	H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W210228	IIT	03/09/12 13:21	
EPA 350.1	Ammonia as N	0.321	mg/L	0.030	0.006		W211199	RHW	03/19/12 15:16	
EPA 353.2	Nitrate/Nitrite as N	< 0.050	mg/L	0.050	0.009		W211257	RHW	03/19/12 11:36	
SM 2320B/2310B	Bicarbonate	228	mg/L	1.0	0.1		W210074	AGF	03/06/12 12:41	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.1		W210074	AGF	03/06/12 12:41	
SM 2320B/2310B	Total Alkalinity	228	mg/L	1.0	0.1		W210074	AGF	03/06/12 12:41	
SM 2540 C	Total Diss. Solids	266	mg/L	10			W210078	RS	03/05/12 17:30	
SM 2540 D	Total Susp. Solids	15.0	mg/L	5.0			W210076	RS	03/05/12 17:30	
SM 4500 H B	pH @23.0°C	7.90	pH Units				W210074	AGF	03/06/12 12:41	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W210289	IIT	03/09/12 12:17	
SM 4500-P-E	Phosphorus	0.032	mg/L	0.010	0.003		W210252	SM	03/08/12 14:31	



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Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: **W2C0061**

Reported: 21-Mar-12 10:08

Client Sample ID: **27FEB12GW008**

SVL Sample ID: **W2C0061-08 (Ground Water)**

Sample Report Page 3 of 3

Sampled: 27-Feb-12 15:45

Received: 05-Mar-12

Sampled By: JW

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	9.27	mg/L	0.20	0.07		W211069	AEW	03/12/12 20:38	
EPA 300.0	Fluoride	0.18	mg/L	0.10	0.02		W211069	AEW	03/12/12 20:38	
EPA 300.0	Sulfate as SO4	6.43	mg/L	0.30	0.04		W211069	AEW	03/12/12 20:38	

Cation/Anion Balance and TDS Ratios

Cation Sum: 4.64 meq/L Anion Sum: 4.96 meq/L C/A Balance: -3.36 % Calculated TDS: 301 TDS/cTDS: 0.88 TDS/eC: 0.61

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Kirby Gray
Technical Director



Tetra Tech EM, Inc. (Boise)
 3380 Americana Terrace, Suite 201
 Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
 Work Order: **W2C0061**
 Reported: 21-Mar-12 10:08

Client Sample ID: **28FEB12GW009**

SVL Sample ID: **W2C0061-09 (Ground Water)**

Sample Report Page 1 of 3

Sampled: 28-Feb-12 12:00
 Received: 05-Mar-12
 Sampled By: JW

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W210313	STA	03/12/12 10:28	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	0.357	mg/L	0.080	0.008		W210083	AS	03/19/12 17:48	
EPA 200.7	Barium	0.175	mg/L	0.0020	0.0002		W210083	AS	03/19/12 17:48	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W210083	AS	03/19/12 17:48	
EPA 200.7	Calcium	43.9	mg/L	0.040	0.006		W210083	AS	03/19/12 17:48	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0003		W210083	AS	03/19/12 17:48	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W210083	AS	03/19/12 17:48	
EPA 200.7	Iron	1.34	mg/L	0.060	0.008		W210083	AS	03/19/12 17:48	
EPA 200.7	Magnesium	19.3	mg/L	0.060	0.010		W210083	AS	03/19/12 17:48	
EPA 200.7	Manganese	1.11	mg/L	0.0040	0.0006		W210083	AS	03/19/12 17:48	
EPA 200.7	Molybdenum	0.008	mg/L	0.008	0.0006		W210083	AS	03/19/12 17:48	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W210083	AS	03/19/12 17:48	
EPA 200.7	Potassium	0.81	mg/L	0.50	0.03		W210083	AS	03/19/12 17:48	
EPA 200.7	Silicon	22.5	mg/L	0.08	0.01		W210083	AS	03/19/12 17:48	
EPA 200.7	Sodium	23.0	mg/L	0.50	0.02		W210083	AS	03/19/12 17:48	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0002		W210083	AS	03/19/12 17:48	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0002		W210083	AS	03/19/12 17:48	
EPA 200.7	Zinc	0.118	mg/L	0.0100	0.0010		W210083	AS	03/19/12 17:48	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W210087	KWH	03/12/12 07:42	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W210087	KWH	03/12/12 07:42	
EPA 200.8	Beryllium	< 0.000400	mg/L	0.000400	0.000192	5	W210087	KWH	03/12/12 09:14	D5
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.00002	2.5	W210087	KWH	03/12/12 07:42	
EPA 200.8	Copper	0.00252	mg/L	0.00100	0.00009	2.5	W210087	KWH	03/12/12 07:42	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000016	2.5	W210087	KWH	03/12/12 07:42	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W210087	KWH	03/12/12 07:42	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.000009	2.5	W210087	KWH	03/12/12 07:42	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000004	2.5	W210087	KWH	03/12/12 07:42	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000006	2.5	W210087	KWH	03/12/12 07:42	
SM 2340B	Hardness (as CaCO3)	171	mg/L	0.347	0.116		N/A		03/20/12 11:19	



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2C0061**
Reported: 21-Mar-12 10:08

Client Sample ID: **28FEB12GW009**

SVL Sample ID: **W2C0061-09 (Ground Water)**

Sample Report Page 2 of 3

Sampled: 28-Feb-12 12:00
Received: 05-Mar-12
Sampled By: JW

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Dissolved)

EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.016		W210080	DT	03/20/12 11:19	
EPA 200.7	Barium	0.161	mg/L	0.0020	0.0004		W210080	DT	03/20/12 11:19	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W210080	DT	03/20/12 11:19	
EPA 200.7	Calcium	39.6	mg/L	0.040	0.012		W210080	DT	03/20/12 11:19	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W210080	DT	03/20/12 11:19	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W210080	DT	03/20/12 11:19	
EPA 200.7	Iron	0.543	mg/L	0.060	0.017		W210080	DT	03/20/12 11:19	
EPA 200.7	Magnesium	17.5	mg/L	0.060	0.021		W210080	DT	03/20/12 11:19	
EPA 200.7	Manganese	1.02	mg/L	0.0040	0.0011		W210080	DT	03/20/12 11:19	
EPA 200.7	Molybdenum	0.011	mg/L	0.008	0.001		W210080	DT	03/20/12 11:19	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W210080	DT	03/20/12 11:19	
EPA 200.7	Potassium	0.72	mg/L	0.50	0.07		W210080	DT	03/20/12 11:19	
EPA 200.7	Silicon	21.0	mg/L	0.08	0.03		W210080	DT	03/20/12 11:19	
EPA 200.7	Sodium	21.7	mg/L	0.50	0.04		W210080	DT	03/20/12 11:19	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W210080	DT	03/20/12 11:19	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W210080	DT	03/20/12 11:19	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0021		W210080	DT	03/20/12 11:19	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W210089	KWH	03/14/12 08:55	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W210089	KWH	03/14/12 08:55	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000077		W210089	KWH	03/14/12 08:55	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.000013		W210089	KWH	03/14/12 08:55	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.000072		W210089	KWH	03/14/12 08:55	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000013		W210089	KWH	03/14/12 08:55	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W210089	KWH	03/14/12 08:55	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.0000074		W210089	KWH	03/14/12 08:58	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000033		W210089	KWH	03/14/12 08:55	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000049		W210089	KWH	03/14/12 08:55	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W210312	STA	03/12/12 10:28	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0005		W210178	IIT	03/07/12 15:25	
EPA 120.1	Specific conductance	413	µmhos/cm	5.00			W210075	RS	03/05/12 17:06	
EPA 180.1	Turbidity	18.5	NTU	0.100			W210111	SM	03/06/12 12:39	H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W210228	IIT	03/09/12 13:23	
EPA 350.1	Ammonia as N	0.035	mg/L	0.030	0.006		W211199	RHW	03/19/12 15:25	
EPA 353.2	Nitrate/Nitrite as N	< 0.050	mg/L	0.050	0.009		W211257	RHW	03/19/12 11:38	
SM 2320B/2310B	Bicarbonate	228	mg/L	1.0	0.1		W210074	AGF	03/06/12 12:47	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.1		W210074	AGF	03/06/12 12:47	
SM 2320B/2310B	Total Alkalinity	228	mg/L	1.0	0.1		W210074	AGF	03/06/12 12:47	
SM 2540 C	Total Diss. Solids	259	mg/L	10			W210078	RS	03/05/12 17:30	
SM 2540 D	Total Susp. Solids	47.0	mg/L	5.0			W210076	RS	03/05/12 17:30	
SM 4500 H B	pH @23.0°C	7.87	pH Units				W210074	AGF	03/06/12 12:47	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W210289	IIT	03/09/12 12:19	
SM 4500-P-E	Phosphorus	0.049	mg/L	0.010	0.003		W210252	SM	03/08/12 14:31	



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

(208) 784-1258

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Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: **W2C0061**

Reported: 21-Mar-12 10:08

Client Sample ID: **28FEB12GW009**

SVL Sample ID: **W2C0061-09 (Ground Water)**

Sample Report Page 3 of 3

Sampled: 28-Feb-12 12:00

Received: 05-Mar-12

Sampled By: JW

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	4.86	mg/L	0.20	0.07		W211069	AEW	03/12/12 21:24	
EPA 300.0	Fluoride	0.18	mg/L	0.10	0.02		W211069	AEW	03/12/12 21:24	
EPA 300.0	Sulfate as SO4	1.24	mg/L	0.30	0.04		W211069	AEW	03/13/12 10:46	

Cation/Anion Balance and TDS Ratios

Cation Sum: 4.44 meq/L Anion Sum: 4.73 meq/L C/A Balance: -3.13 % Calculated TDS: 285 TDS/cTDS: 0.91 TDS/eC: 0.63

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Kirby Gray
Technical Director



Tetra Tech EM, Inc. (Boise)
 3380 Americana Terrace, Suite 201
 Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: **W2C0061**

Reported: 21-Mar-12 10:08

Client Sample ID: **28FEB12GW109**

SVL Sample ID: **W2C0061-10 (Ground Water)**

Sample Report Page 1 of 3

Sampled: 28-Feb-12 12:00

Received: 05-Mar-12

Sampled By: JW

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W210313	STA	03/12/12 10:29	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	0.363	mg/L	0.080	0.008		W210083	AS	03/19/12 17:54	
EPA 200.7	Barium	0.174	mg/L	0.0020	0.0002		W210083	AS	03/19/12 17:54	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.005		W210083	AS	03/19/12 17:54	
EPA 200.7	Calcium	43.9	mg/L	0.040	0.006		W210083	AS	03/19/12 17:54	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0003		W210083	AS	03/19/12 17:54	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0005		W210083	AS	03/19/12 17:54	
EPA 200.7	Iron	1.34	mg/L	0.060	0.008		W210083	AS	03/19/12 17:54	
EPA 200.7	Magnesium	19.4	mg/L	0.060	0.010		W210083	AS	03/19/12 17:54	
EPA 200.7	Manganese	1.11	mg/L	0.0040	0.0006		W210083	AS	03/19/12 17:54	
EPA 200.7	Molybdenum	0.008	mg/L	0.008	0.0006		W210083	AS	03/19/12 17:54	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W210083	AS	03/19/12 17:54	
EPA 200.7	Potassium	0.82	mg/L	0.50	0.03		W210083	AS	03/19/12 17:54	
EPA 200.7	Silicon	22.7	mg/L	0.08	0.01		W210083	AS	03/19/12 17:54	
EPA 200.7	Sodium	23.2	mg/L	0.50	0.02		W210083	AS	03/19/12 17:54	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0002		W210083	AS	03/19/12 17:54	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0002		W210083	AS	03/19/12 17:54	
EPA 200.7	Zinc	0.117	mg/L	0.0100	0.0010		W210083	AS	03/19/12 17:54	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W210087	KWH	03/12/12 07:55	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W210087	KWH	03/12/12 07:55	
EPA 200.8	Beryllium	< 0.000400	mg/L	0.000400	0.000192	5	W210087	KWH	03/12/12 09:16	D5
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.00002	2.5	W210087	KWH	03/12/12 07:55	
EPA 200.8	Copper	0.00220	mg/L	0.00100	0.00009	2.5	W210087	KWH	03/12/12 07:55	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000016	2.5	W210087	KWH	03/12/12 07:55	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W210087	KWH	03/12/12 07:55	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.000009	2.5	W210087	KWH	03/12/12 07:55	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000004	2.5	W210087	KWH	03/12/12 07:55	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000006	2.5	W210087	KWH	03/12/12 07:55	
SM 2340B	Hardness (as CaCO3)	171	mg/L	0.347	0.116		N/A		03/20/12 11:25	



Tetra Tech EM, Inc. (Boise)
 3380 Americana Terrace, Suite 201
 Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
 Work Order: **W2C0061**
 Reported: 21-Mar-12 10:08

Client Sample ID: **28FEB12GW109**

SVL Sample ID: **W2C0061-10 (Ground Water)**

Sample Report Page 2 of 3

Sampled: 28-Feb-12 12:00
 Received: 05-Mar-12
 Sampled By: JW

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Dissolved)

EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.016		W210080	DT	03/20/12 11:25	
EPA 200.7	Barium	0.162	mg/L	0.0020	0.0004		W210080	DT	03/20/12 11:25	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.010		W210080	DT	03/20/12 11:25	
EPA 200.7	Calcium	39.7	mg/L	0.040	0.012		W210080	DT	03/20/12 11:25	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0006		W210080	DT	03/20/12 11:25	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0009		W210080	DT	03/20/12 11:25	
EPA 200.7	Iron	0.546	mg/L	0.060	0.017		W210080	DT	03/20/12 11:25	
EPA 200.7	Magnesium	17.5	mg/L	0.060	0.021		W210080	DT	03/20/12 11:25	
EPA 200.7	Manganese	1.02	mg/L	0.0040	0.0011		W210080	DT	03/20/12 11:25	
EPA 200.7	Molybdenum	0.010	mg/L	0.008	0.001		W210080	DT	03/20/12 11:25	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.003		W210080	DT	03/20/12 11:25	
EPA 200.7	Potassium	0.74	mg/L	0.50	0.07		W210080	DT	03/20/12 11:25	
EPA 200.7	Silicon	21.1	mg/L	0.08	0.03		W210080	DT	03/20/12 11:25	
EPA 200.7	Sodium	21.9	mg/L	0.50	0.04		W210080	DT	03/20/12 11:25	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W210080	DT	03/20/12 11:25	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W210080	DT	03/20/12 11:25	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0021		W210080	DT	03/20/12 11:25	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W210089	KWH	03/14/12 08:59	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W210089	KWH	03/14/12 08:59	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000077		W210089	KWH	03/14/12 08:59	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.000013		W210089	KWH	03/14/12 08:59	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.000072		W210089	KWH	03/14/12 08:59	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000013		W210089	KWH	03/14/12 08:59	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W210089	KWH	03/14/12 08:59	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.0000074		W210089	KWH	03/14/12 09:00	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000033		W210089	KWH	03/14/12 08:59	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000049		W210089	KWH	03/14/12 08:59	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000072		W210312	STA	03/12/12 10:29	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0005		W210178	IIT	03/07/12 15:27	
EPA 120.1	Specific conductance	416	µmhos/cm	5.00			W210075	RS	03/05/12 17:06	
EPA 180.1	Turbidity	17.8	NTU	0.100			W210111	SM	03/06/12 12:39	H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W210228	IIT	03/09/12 13:25	
EPA 350.1	Ammonia as N	< 0.030	mg/L	0.030	0.006		W211199	RHW	03/19/12 15:27	
EPA 353.2	Nitrate/Nitrite as N	< 0.050	mg/L	0.050	0.009		W211257	RHW	03/19/12 11:39	
SM 2320B/2310B	Bicarbonate	227	mg/L	1.0	0.1		W210074	AGF	03/06/12 12:53	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.1		W210074	AGF	03/06/12 12:53	
SM 2320B/2310B	Total Alkalinity	227	mg/L	1.0	0.1		W210074	AGF	03/06/12 12:53	
SM 2540 C	Total Diss. Solids	251	mg/L	10			W210078	RS	03/05/12 17:30	
SM 2540 D	Total Susp. Solids	43.0	mg/L	5.0			W210076	RS	03/05/12 17:30	
SM 4500 H B	pH @23.0°C	7.89	pH Units				W210074	AGF	03/06/12 12:53	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W210289	IIT	03/09/12 12:21	
SM 4500-P-E	Phosphorus	0.052	mg/L	0.010	0.003		W210252	SM	03/08/12 14:31	



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Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: **W2C0061**

Reported: 21-Mar-12 10:08

Client Sample ID: **28FEB12GW109**

SVL Sample ID: **W2C0061-10 (Ground Water)**

Sample Report Page 3 of 3

Sampled: 28-Feb-12 12:00

Received: 05-Mar-12

Sampled By: JW

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	4.83	mg/L	0.20	0.07		W211069	AEW	03/12/12 21:46	
EPA 300.0	Fluoride	0.17	mg/L	0.10	0.02		W211069	AEW	03/12/12 21:46	
EPA 300.0	Sulfate as SO4	1.12	mg/L	0.30	0.04		W211069	AEW	03/13/12 10:58	

Cation/Anion Balance and TDS Ratios

Cation Sum: 4.45 meq/L Anion Sum: 4.70 meq/L C/A Balance: -2.74 % Calculated TDS: 285 TDS/cTDS: 0.88 TDS/eC: 0.60

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Kirby Gray
Technical Director



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: **Suriname Merian 2012 / 113-93245**

Work Order: **W2C0061**

Reported: 21-Mar-12 10:08

Quality Control - BLANK Data

Method	Analyte	Units	Result	MDL	MRL	Batch ID	Analyzed	Notes
Metals (Total)								
EPA 245.1	Mercury	mg/L	<0.00020	0.000072	0.00020	W210313	12-Mar-12	
Metals (Total Recoverable--reportable as Total per 40 CFR 136)								
EPA 200.7	Aluminum	mg/L	<0.080	0.008	0.080	W210083	19-Mar-12	
EPA 200.7	Barium	mg/L	<0.0020	0.0002	0.0020	W210083	19-Mar-12	
EPA 200.7	Boron	mg/L	<0.040	0.005	0.040	W210083	19-Mar-12	
EPA 200.7	Calcium	mg/L	<0.040	0.006	0.040	W210083	19-Mar-12	
EPA 200.7	Chromium	mg/L	<0.0060	0.0003	0.0060	W210083	19-Mar-12	
EPA 200.7	Cobalt	mg/L	<0.0060	0.0005	0.0060	W210083	19-Mar-12	
EPA 200.7	Iron	mg/L	<0.060	0.008	0.060	W210083	19-Mar-12	
EPA 200.7	Magnesium	mg/L	<0.060	0.010	0.060	W210083	19-Mar-12	
EPA 200.7	Manganese	mg/L	<0.0040	0.0006	0.0040	W210083	19-Mar-12	
EPA 200.7	Molybdenum	mg/L	<0.008	0.0006	0.008	W210083	19-Mar-12	
EPA 200.7	Nickel	mg/L	<0.010	0.002	0.010	W210083	19-Mar-12	
EPA 200.7	Potassium	mg/L	<0.50	0.03	0.50	W210083	19-Mar-12	
EPA 200.7	Silicon	mg/L	<0.08	0.01	0.08	W210083	19-Mar-12	
EPA 200.7	Sodium	mg/L	<0.50	0.02	0.50	W210083	19-Mar-12	
EPA 200.7	Titanium	mg/L	<0.0050	0.0002	0.0050	W210083	19-Mar-12	
EPA 200.7	Vanadium	mg/L	<0.0050	0.0002	0.0050	W210083	19-Mar-12	
EPA 200.7	Zinc	mg/L	<0.0100	0.0010	0.0100	W210083	19-Mar-12	
EPA 200.8	Antimony	mg/L	<0.00300	0.00015	0.00300	W210087	12-Mar-12	
EPA 200.8	Arsenic	mg/L	<0.0030	0.0003	0.0030	W210087	12-Mar-12	
EPA 200.8	Beryllium	mg/L	<0.000200	0.000096	0.000200	W210087	12-Mar-12	
EPA 200.8	Copper	mg/L	<0.00100	0.00009	0.00100	W210087	12-Mar-12	
EPA 200.8	Lead	mg/L	<0.00300	0.000016	0.00300	W210087	12-Mar-12	
EPA 200.8	Selenium	mg/L	<0.00300	0.00028	0.00300	W210087	12-Mar-12	
EPA 200.8	Silver	mg/L	<0.000100	0.000009	0.000100	W210087	12-Mar-12	
EPA 200.8	Uranium	mg/L	<0.00100	0.000006	0.00100	W210087	12-Mar-12	
EPA 200.8	Thallium	mg/L	<0.00100	0.000004	0.00100	W210087	12-Mar-12	
EPA 200.8	Cadmium	mg/L	<0.00020	0.00002	0.00020	W210087	12-Mar-12	
Metals (Dissolved)								
EPA 200.7	Aluminum	mg/L	<0.080	0.016	0.080	W210080	20-Mar-12	
EPA 200.7	Barium	mg/L	<0.0020	0.0004	0.0020	W210080	20-Mar-12	
EPA 200.7	Boron	mg/L	<0.040	0.010	0.040	W210080	20-Mar-12	
EPA 200.7	Calcium	mg/L	<0.040	0.012	0.040	W210080	20-Mar-12	
EPA 200.7	Chromium	mg/L	<0.0060	0.0006	0.0060	W210080	20-Mar-12	
EPA 200.7	Cobalt	mg/L	<0.0060	0.0009	0.0060	W210080	20-Mar-12	
EPA 200.7	Iron	mg/L	<0.060	0.017	0.060	W210080	20-Mar-12	
EPA 200.7	Magnesium	mg/L	<0.060	0.021	0.060	W210080	20-Mar-12	
EPA 200.7	Manganese	mg/L	<0.0040	0.0011	0.0040	W210080	20-Mar-12	
EPA 200.7	Molybdenum	mg/L	<0.008	0.001	0.008	W210080	20-Mar-12	
EPA 200.7	Nickel	mg/L	<0.010	0.003	0.010	W210080	20-Mar-12	
EPA 200.7	Potassium	mg/L	<0.50	0.07	0.50	W210080	20-Mar-12	
EPA 200.7	Silicon	mg/L	<0.08	0.03	0.08	W210080	20-Mar-12	
EPA 200.7	Sodium	mg/L	<0.50	0.04	0.50	W210080	20-Mar-12	
EPA 200.7	Titanium	mg/L	<0.0050	0.0003	0.0050	W210080	20-Mar-12	
EPA 200.7	Vanadium	mg/L	<0.0050	0.0005	0.0050	W210080	20-Mar-12	
EPA 200.7	Zinc	mg/L	<0.0100	0.0021	0.0100	W210080	20-Mar-12	
EPA 200.8	Antimony	mg/L	<0.00300	0.00012	0.00300	W210089	14-Mar-12	
EPA 200.8	Arsenic	mg/L	<0.0030	0.0002	0.0030	W210089	14-Mar-12	
EPA 200.8	Beryllium	mg/L	<0.000200	0.000077	0.000200	W210089	14-Mar-12	
EPA 200.8	Cadmium	mg/L	<0.00020	0.000013	0.00020	W210089	14-Mar-12	
EPA 200.8	Copper	mg/L	<0.00100	0.000072	0.00100	W210089	14-Mar-12	
EPA 200.8	Lead	mg/L	<0.00300	0.000013	0.00300	W210089	14-Mar-12	
EPA 200.8	Selenium	mg/L	<0.00300	0.00022	0.00300	W210089	14-Mar-12	
EPA 200.8	Silver	mg/L	<0.000100	0.0000074	0.000100	W210089	14-Mar-12	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268

Work order Report Page 32 of 39



Tetra Tech EM, Inc. (Boise)
 3380 Americana Terrace, Suite 201
 Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
 Work Order: **W2C0061**
 Reported: 21-Mar-12 10:08

Quality Control - BLANK Data (Continued)

Method	Analyte	Units	Result	MDL	MRL	Batch ID	Analyzed	Notes
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Metals (Dissolved) (Continued)

EPA 200.8	Thallium	mg/L	<0.00100	0.0000033	0.00100	W210089	14-Mar-12	
EPA 200.8	Uranium	mg/L	<0.00100	0.0000049	0.00100	W210089	14-Mar-12	
EPA 245.1	Mercury	mg/L	<0.00020	0.000072	0.00020	W210183	08-Mar-12	
EPA 245.1	Mercury	mg/L	<0.00020	0.000072	0.00020	W210312	12-Mar-12	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	mg/L	<0.005	0.0005	0.005	W210178	07-Mar-12	
ASTM D7237	Cyanide (free)	mg/L	<0.005	0.0005	0.005	W210309	09-Mar-12	
EPA 120.1	Specific conductance	µmhos/cm	<5.00		5.00	W210075	05-Mar-12	
EPA 180.1	Turbidity	NTU	<0.100		0.100	W210111	06-Mar-12	
EPA 335.4	Cyanide (total)	mg/L	<0.0100	0.0021	0.0100	W210228	09-Mar-12	
EPA 350.1	Ammonia as N	mg/L	<0.030	0.006	0.030	W211199	19-Mar-12	
EPA 353.2	Nitrate/Nitrite as N	mg/L	<0.050	0.009	0.050	W211257	19-Mar-12	
SM 2540 C	Total Diss. Solids	mg/L	<10		10	W210078	05-Mar-12	
SM 2540 D	Total Susp. Solids	mg/L	<5.0		5.0	W210076	05-Mar-12	
SM 4500-CN-I	Cyanide (WAD)	mg/L	<0.0100	0.0006	0.0100	W210289	09-Mar-12	
SM 4500-P-E	Phosphorus	mg/L	<0.010	0.003	0.010	W210252	08-Mar-12	

Anions by Ion Chromatography

EPA 300.0	Fluoride	mg/L	<0.10	0.02	0.10	W211069	12-Mar-12	
EPA 300.0	Chloride	mg/L	<0.20	0.07	0.20	W211069	12-Mar-12	
EPA 300.0	Sulfate as SO4	mg/L	<0.30	0.04	0.30	W211069	12-Mar-12	

Quality Control - LABORATORY CONTROL SAMPLE Data

Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	mg/L	0.00512	0.00500	102	85 - 115	W210313	12-Mar-12	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	mg/L	1.05	1.00	105	85 - 115	W210083	19-Mar-12	
EPA 200.7	Barium	mg/L	1.01	1.00	101	85 - 115	W210083	19-Mar-12	
EPA 200.7	Boron	mg/L	1.03	1.00	103	85 - 115	W210083	19-Mar-12	
EPA 200.7	Calcium	mg/L	20.1	20.0	100	85 - 115	W210083	19-Mar-12	
EPA 200.7	Chromium	mg/L	1.02	1.00	102	85 - 115	W210083	19-Mar-12	
EPA 200.7	Cobalt	mg/L	1.01	1.00	101	85 - 115	W210083	19-Mar-12	
EPA 200.7	Iron	mg/L	9.90	10.0	99.0	85 - 115	W210083	19-Mar-12	
EPA 200.7	Magnesium	mg/L	20.3	20.0	101	85 - 115	W210083	19-Mar-12	
EPA 200.7	Manganese	mg/L	1.00	1.00	100	85 - 115	W210083	19-Mar-12	
EPA 200.7	Molybdenum	mg/L	1.03	1.00	103	85 - 115	W210083	19-Mar-12	
EPA 200.7	Nickel	mg/L	1.01	1.00	101	85 - 115	W210083	19-Mar-12	
EPA 200.7	Potassium	mg/L	20.4	20.0	102	85 - 115	W210083	19-Mar-12	
EPA 200.7	Silicon	mg/L	4.94	5.00	98.8	85 - 115	W210083	19-Mar-12	
EPA 200.7	Sodium	mg/L	19.5	19.0	103	85 - 115	W210083	19-Mar-12	
EPA 200.7	Titanium	mg/L	1.05	1.00	105	85 - 115	W210083	19-Mar-12	
EPA 200.7	Vanadium	mg/L	1.05	1.00	105	85 - 115	W210083	19-Mar-12	
EPA 200.7	Zinc	mg/L	0.989	1.00	98.9	85 - 115	W210083	19-Mar-12	
EPA 200.8	Antimony	mg/L	0.0279	0.0250	112	85 - 115	W210087	12-Mar-12	
EPA 200.8	Arsenic	mg/L	0.0256	0.0250	102	85 - 115	W210087	12-Mar-12	
EPA 200.8	Beryllium	mg/L	0.0239	0.0250	95.6	85 - 115	W210087	12-Mar-12	
EPA 200.8	Copper	mg/L	0.0248	0.0250	99.3	85 - 115	W210087	12-Mar-12	
EPA 200.8	Lead	mg/L	0.0239	0.0250	95.4	85 - 115	W210087	12-Mar-12	
EPA 200.8	Selenium	mg/L	0.0256	0.0250	103	85 - 115	W210087	12-Mar-12	
EPA 200.8	Silver	mg/L	0.0260	0.0250	104	85 - 115	W210087	12-Mar-12	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2C0061**
Reported: 21-Mar-12 10:08

Quality Control - LABORATORY CONTROL SAMPLE Data (Continued)

Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Total Recoverable--reportable as Total per 40 CFR 136) (Continued)

EPA 200.8	Uranium	mg/L	0.0246	0.0250	98.5	85 - 115	W210087	12-Mar-12	
EPA 200.8	Thallium	mg/L	0.0245	0.0250	97.8	85 - 115	W210087	12-Mar-12	
EPA 200.8	Cadmium	mg/L	0.0255	0.0250	102	85 - 115	W210087	12-Mar-12	

Metals (Dissolved)

EPA 200.7	Aluminum	mg/L	0.954	1.00	95.4	85 - 115	W210080	20-Mar-12	
EPA 200.7	Barium	mg/L	0.979	1.00	97.9	85 - 115	W210080	20-Mar-12	
EPA 200.7	Boron	mg/L	0.967	1.00	96.7	85 - 115	W210080	20-Mar-12	
EPA 200.7	Calcium	mg/L	18.8	20.0	93.9	85 - 115	W210080	20-Mar-12	
EPA 200.7	Chromium	mg/L	0.973	1.00	97.3	85 - 115	W210080	20-Mar-12	
EPA 200.7	Cobalt	mg/L	0.935	1.00	93.5	85 - 115	W210080	20-Mar-12	
EPA 200.7	Iron	mg/L	9.17	10.0	91.7	85 - 115	W210080	20-Mar-12	
EPA 200.7	Magnesium	mg/L	18.3	20.0	91.7	85 - 115	W210080	20-Mar-12	
EPA 200.7	Manganese	mg/L	0.942	1.00	94.2	85 - 115	W210080	20-Mar-12	
EPA 200.7	Molybdenum	mg/L	0.955	1.00	95.5	85 - 115	W210080	20-Mar-12	
EPA 200.7	Nickel	mg/L	0.933	1.00	93.3	85 - 115	W210080	20-Mar-12	
EPA 200.7	Potassium	mg/L	18.9	20.0	94.5	85 - 115	W210080	20-Mar-12	
EPA 200.7	Silicon	mg/L	4.81	5.00	96.3	85 - 115	W210080	20-Mar-12	
EPA 200.7	Sodium	mg/L	18.1	19.0	95.0	85 - 115	W210080	20-Mar-12	
EPA 200.7	Titanium	mg/L	0.953	1.00	95.3	85 - 115	W210080	20-Mar-12	
EPA 200.7	Vanadium	mg/L	0.980	1.00	98.0	85 - 115	W210080	20-Mar-12	
EPA 200.7	Zinc	mg/L	0.953	1.00	95.3	85 - 115	W210080	20-Mar-12	
EPA 200.8	Antimony	mg/L	0.0257	0.0250	103	85 - 115	W210089	14-Mar-12	
EPA 200.8	Arsenic	mg/L	0.0251	0.0250	100	85 - 115	W210089	14-Mar-12	
EPA 200.8	Beryllium	mg/L	0.0245	0.0250	98.2	85 - 115	W210089	14-Mar-12	
EPA 200.8	Cadmium	mg/L	0.0245	0.0250	97.8	85 - 115	W210089	14-Mar-12	
EPA 200.8	Copper	mg/L	0.0246	0.0250	98.4	85 - 115	W210089	14-Mar-12	
EPA 200.8	Lead	mg/L	0.0239	0.0250	95.6	85 - 115	W210089	14-Mar-12	
EPA 200.8	Selenium	mg/L	0.0255	0.0250	102	85 - 115	W210089	14-Mar-12	
EPA 200.8	Silver	mg/L	0.0250	0.0250	100	85 - 115	W210089	14-Mar-12	
EPA 200.8	Thallium	mg/L	0.0240	0.0250	96.1	85 - 115	W210089	14-Mar-12	
EPA 200.8	Uranium	mg/L	0.0243	0.0250	97.2	85 - 115	W210089	14-Mar-12	
EPA 245.1	Mercury	mg/L	0.00528	0.00500	106	85 - 115	W210183	08-Mar-12	
EPA 245.1	Mercury	mg/L	0.00516	0.00500	103	85 - 115	W210312	12-Mar-12	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	mg/L	0.152	0.150	101	85 - 115	W210178	07-Mar-12	
ASTM D7237	Cyanide (free)	mg/L	0.150	0.150	100	85 - 115	W210309	09-Mar-12	
EPA 120.1	Specific conductance	µmhos/cm	419	421	99.5	90 - 110	W210075	05-Mar-12	
EPA 180.1	Turbidity	NTU	4.23	4.39	96.4	90 - 110	W210111	06-Mar-12	
EPA 335.4	Cyanide (total)	mg/L	0.140	0.150	93.3	90 - 110	W210228	09-Mar-12	
EPA 350.1	Ammonia as N	mg/L	0.688	0.750	91.7	90 - 110	W211199	19-Mar-12	
EPA 353.2	Nitrate/Nitrite as N	mg/L	1.86	2.00	92.8	90 - 110	W211257	19-Mar-12	
SM 4500-CN-I	Cyanide (WAD)	mg/L	0.148	0.150	98.7	90 - 110	W210289	09-Mar-12	
SM 4500-P-E	Phosphorus	mg/L	0.924	0.877	105	90 - 110	W210252	08-Mar-12	

Anions by Ion Chromatography

EPA 300.0	Fluoride	mg/L	1.97	2.00	98.6	90 - 110	W211069	12-Mar-12	
EPA 300.0	Chloride	mg/L	2.97	3.00	98.9	90 - 110	W211069	12-Mar-12	
EPA 300.0	Sulfate as SO4	mg/L	10.9	10.0	109	90 - 110	W211069	12-Mar-12	



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2C0061**
Reported: 21-Mar-12 10:08

Quality Control - DUPLICATE Data

Method	Analyte	Units	Duplicate Result	Sample Result	RPD	RPD Limit	Batch ID	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	mg/L	0.00027	0.00025	7.7	20	W210313	12-Mar-12	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	mg/L	0.171	0.158	8.3	20	W210083	19-Mar-12	
EPA 200.7	Barium	mg/L	0.146	0.148	1.2	20	W210083	19-Mar-12	
EPA 200.7	Boron	mg/L	<0.040	<0.040	<RL	20	W210083	19-Mar-12	
EPA 200.7	Calcium	mg/L	28.6	29.1	1.8	20	W210083	19-Mar-12	
EPA 200.7	Chromium	mg/L	<0.0060	<0.0060	<RL	20	W210083	19-Mar-12	
EPA 200.7	Cobalt	mg/L	<0.0060	<0.0060	UDL	20	W210083	19-Mar-12	
EPA 200.7	Iron	mg/L	1.94	1.93	0.4	20	W210083	19-Mar-12	
EPA 200.7	Magnesium	mg/L	8.69	8.88	2.1	20	W210083	19-Mar-12	
EPA 200.7	Manganese	mg/L	2.56	2.61	1.9	20	W210083	19-Mar-12	
EPA 200.7	Molybdenum	mg/L	0.029	0.029	0.2	20	W210083	19-Mar-12	
EPA 200.7	Nickel	mg/L	<0.010	<0.010	UDL	20	W210083	19-Mar-12	
EPA 200.7	Potassium	mg/L	1.00	1.02	1.9	20	W210083	19-Mar-12	
EPA 200.7	Silicon	mg/L	13.9	14.1	1.5	20	W210083	19-Mar-12	
EPA 200.7	Sodium	mg/L	31.5	32.2	2.0	20	W210083	19-Mar-12	
EPA 200.7	Titanium	mg/L	<0.0050	<0.0050	<RL	20	W210083	19-Mar-12	
EPA 200.7	Vanadium	mg/L	<0.0050	<0.0050	<RL	20	W210083	19-Mar-12	
EPA 200.7	Zinc	mg/L	0.0263	0.0264	0.5	20	W210083	19-Mar-12	
EPA 200.8	Antimony	mg/L	<0.00300	<0.00300	UDL	20	W210087	12-Mar-12	
EPA 200.8	Arsenic	mg/L	<0.0030	<0.0030	<RL	20	W210087	12-Mar-12	
EPA 200.8	Beryllium	mg/L	<0.000200	<0.000200	UDL	20	W210087	12-Mar-12	
EPA 200.8	Copper	mg/L	0.00110	0.00115	4.4	20	W210087	12-Mar-12	
EPA 200.8	Lead	mg/L	<0.00300	<0.00300	<RL	20	W210087	12-Mar-12	
EPA 200.8	Selenium	mg/L	<0.00300	<0.00300	UDL	20	W210087	12-Mar-12	
EPA 200.8	Silver	mg/L	<0.000100	<0.000100	UDL	20	W210087	12-Mar-12	
EPA 200.8	Uranium	mg/L	<0.00100	<0.00100	<RL	20	W210087	12-Mar-12	
EPA 200.8	Thallium	mg/L	<0.00100	<0.00100	<RL	20	W210087	12-Mar-12	
EPA 200.8	Cadmium	mg/L	<0.00020	<0.00020	<RL	20	W210087	12-Mar-12	

Metals (Dissolved)

EPA 200.7	Aluminum	mg/L	0.185	0.188	1.7	20	W210080	20-Mar-12	
EPA 200.7	Barium	mg/L	0.0063	0.0066	4.0	20	W210080	20-Mar-12	
EPA 200.7	Boron	mg/L	<0.040	<0.040	UDL	20	W210080	20-Mar-12	
EPA 200.7	Calcium	mg/L	317	319	0.7	20	W210080	20-Mar-12	
EPA 200.7	Chromium	mg/L	<0.0060	<0.0060	<RL	20	W210080	20-Mar-12	
EPA 200.7	Cobalt	mg/L	<0.0060	<0.0060	UDL	20	W210080	20-Mar-12	
EPA 200.7	Iron	mg/L	<0.060	<0.060	UDL	20	W210080	20-Mar-12	
EPA 200.7	Magnesium	mg/L	0.612	0.647	5.6	20	W210080	20-Mar-12	
EPA 200.7	Manganese	mg/L	<0.0040	<0.0040	UDL	20	W210080	20-Mar-12	
EPA 200.7	Molybdenum	mg/L	0.457	0.464	1.4	20	W210080	20-Mar-12	
EPA 200.7	Nickel	mg/L	<0.010	<0.010	UDL	20	W210080	20-Mar-12	
EPA 200.7	Potassium	mg/L	11.6	11.7	1.2	20	W210080	20-Mar-12	
EPA 200.7	Silicon	mg/L	2.07	2.14	3.6	20	W210080	20-Mar-12	
EPA 200.7	Sodium	mg/L	19.5	19.9	2.1	20	W210080	20-Mar-12	
EPA 200.7	Titanium	mg/L	<0.0050	<0.0050	UDL	20	W210080	20-Mar-12	
EPA 200.7	Vanadium	mg/L	<0.0050	<0.0050	<RL	20	W210080	20-Mar-12	
EPA 200.7	Zinc	mg/L	<0.0100	<0.0100	UDL	20	W210080	20-Mar-12	
EPA 200.8	Antimony	mg/L	<0.00300	<0.00300	<RL	20	W210089	14-Mar-12	
EPA 200.8	Arsenic	mg/L	<0.0030	<0.0030	<RL	20	W210089	14-Mar-12	
EPA 200.8	Beryllium	mg/L	<0.000200	<0.000200	UDL	20	W210089	14-Mar-12	
EPA 200.8	Cadmium	mg/L	<0.00020	<0.00020	UDL	20	W210089	14-Mar-12	
EPA 200.8	Copper	mg/L	<0.00100	<0.00100	<RL	20	W210089	14-Mar-12	
EPA 200.8	Lead	mg/L	<0.00300	<0.00300	<RL	20	W210089	14-Mar-12	
EPA 200.8	Selenium	mg/L	<0.00300	<0.00300	UDL	20	W210089	14-Mar-12	
EPA 200.8	Silver	mg/L	<0.000100	<0.000100	UDL	20	W210089	14-Mar-12	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



Tetra Tech EM, Inc. (Boise)
 3380 Americana Terrace, Suite 201
 Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
 Work Order: **W2C0061**
 Reported: 21-Mar-12 10:08

Quality Control - DUPLICATE Data (Continued)

Method	Analyte	Units	Duplicate Result	Sample Result	RPD	RPD Limit	Batch ID	Analyzed	Notes
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Metals (Dissolved) (Continued)

EPA 200.8	Thallium	mg/L	<0.00100	<0.00100	<RL	20	W210089	14-Mar-12	
EPA 200.8	Uranium	mg/L	<0.00100	<0.00100	<RL	20	W210089	14-Mar-12	
EPA 245.1	Mercury	mg/L	<0.00020	<0.00020	UDL	20	W210183	08-Mar-12	
EPA 245.1	Mercury	mg/L	<0.00020	<0.00020	UDL	20	W210312	12-Mar-12	

Classical Chemistry Parameters

EPA 120.1	Specific conductance	µmhos/cm	322	323	0.2	20	W210075	05-Mar-12	
EPA 180.1	Turbidity	NTU	18.3	17.8	2.8	20	W210111	06-Mar-12	
EPA 335.4	Cyanide (total)	mg/L	<0.0100	<0.0100	UDL	20	W210228	09-Mar-12	
EPA 350.1	Ammonia as N	mg/L	22.0	23.4	6.1	20	W211199	19-Mar-12	D2
EPA 353.2	Nitrate/Nitrite as N	mg/L	<0.050	<0.050	UDL	20	W211257	19-Mar-12	
SM 2320B/2310B	Total Alkalinity	mg/L	174	175	0.2	20	W210074	06-Mar-12	
SM 2320B/2310B	Total Alkalinity	mg/L	42.9	42.3	1.5	20	W210074	06-Mar-12	
SM 2320B/2310B	Total Alkalinity	mg/L	<1.0	<1.0	UDL	20	W210074	09-Mar-12	
SM 2320B/2310B	Bicarbonate	mg/L	174	175	0.2	20	W210074	06-Mar-12	
SM 2320B/2310B	Bicarbonate	mg/L	31.3	35.1	11.3	20	W210074	07-Mar-12	
SM 2320B/2310B	Bicarbonate	mg/L	<1.0	<1.0	UDL	20	W210074	09-Mar-12	
SM 2320B/2310B	Carbonate	mg/L	11.6	7.2	46.9	20	W210074	07-Mar-12	R2
SM 2320B/2310B	Carbonate	mg/L	<1.0	<1.0	UDL	20	W210074	06-Mar-12	
SM 2320B/2310B	Carbonate	mg/L	<1.0	<1.0	UDL	20	W210074	09-Mar-12	
SM 2540 C	Total Diss. Solids	mg/L	252	261	3.5	10	W210078	05-Mar-12	
SM 2540 D	Total Susp. Solids	mg/L	14.0	14.0	0.0	10	W210076	05-Mar-12	
SM 4500 H B	pH	pH Units	7.55	7.72	2.2	20	W210074	06-Mar-12	R1
SM 4500 H B	pH	pH Units	8.96	8.76	2.3	20	W210074	06-Mar-12	R1
SM 4500-CN-I	Cyanide (WAD)	mg/L	<0.0100	<0.0100	<RL	20	W210289	09-Mar-12	
SM 4500-P-E	Phosphorus	mg/L	0.135	0.130	3.8	20	W210252	08-Mar-12	

Anions by Ion Chromatography

EPA 300.0	Fluoride	mg/L	<0.10	<0.10	<RL	20	W211069	12-Mar-12	
EPA 300.0	Chloride	mg/L	3.94	3.91	0.6	20	W211069	12-Mar-12	
EPA 300.0	Sulfate as SO4	mg/L	8.99	8.96	0.3	20	W211069	12-Mar-12	

Quality Control - MATRIX SPIKE Data

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	mg/L	0.00121	0.00025	0.00100	96.0	70 - 130	W210313	12-Mar-12	
EPA 245.1	Mercury	mg/L	0.00096	<0.00020	0.00100	96.0	70 - 130	W210313	12-Mar-12	

Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	mg/L	1.69	0.158	1.00	153	70 - 130	W210083	19-Mar-12	M1
EPA 200.7	Barium	mg/L	1.17	0.148	1.00	102	70 - 130	W210083	19-Mar-12	
EPA 200.7	Boron	mg/L	1.06	<0.040	1.00	105	70 - 130	W210083	19-Mar-12	
EPA 200.7	Calcium	mg/L	48.8	29.1	20.0	98.4	70 - 130	W210083	19-Mar-12	
EPA 200.7	Chromium	mg/L	1.03	<0.0060	1.00	103	70 - 130	W210083	19-Mar-12	
EPA 200.7	Cobalt	mg/L	1.01	<0.0060	1.00	101	70 - 130	W210083	19-Mar-12	
EPA 200.7	Iron	mg/L	12.0	1.93	10.0	101	70 - 130	W210083	19-Mar-12	
EPA 200.7	Magnesium	mg/L	28.9	8.88	20.0	100	70 - 130	W210083	19-Mar-12	
EPA 200.7	Manganese	mg/L	3.56	2.61	1.00	94.9	70 - 130	W210083	19-Mar-12	
EPA 200.7	Molybdenum	mg/L	1.07	0.029	1.00	104	70 - 130	W210083	19-Mar-12	
EPA 200.7	Nickel	mg/L	1.02	<0.010	1.00	102	70 - 130	W210083	19-Mar-12	
EPA 200.7	Potassium	mg/L	21.8	1.02	20.0	104	70 - 130	W210083	19-Mar-12	
EPA 200.7	Silicon	mg/L	19.3	14.1	5.00	104	70 - 130	W210083	19-Mar-12	
EPA 200.7	Sodium	mg/L	51.2	32.2	19.0	100	70 - 130	W210083	19-Mar-12	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



Tetra Tech EM, Inc. (Boise)
 3380 Americana Terrace, Suite 201
 Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
 Work Order: **W2C0061**
 Reported: 21-Mar-12 10:08

Quality Control - MATRIX SPIKE Data (Continued)

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Total Recoverable--reportable as Total per 40 CFR 136) (Continued)

EPA 200.7	Titanium	mg/L	1.06	<0.0050	1.00	106	70 - 130	W210083	19-Mar-12	
EPA 200.7	Vanadium	mg/L	1.06	<0.0050	1.00	106	70 - 130	W210083	19-Mar-12	
EPA 200.7	Zinc	mg/L	1.01	0.0264	1.00	98.2	70 - 130	W210083	19-Mar-12	
EPA 200.8	Antimony	mg/L	0.0277	<0.00300	0.0250	111	70 - 130	W210087	12-Mar-12	
EPA 200.8	Arsenic	mg/L	0.0270	<0.0030	0.0250	102	70 - 130	W210087	12-Mar-12	
EPA 200.8	Beryllium	mg/L	0.0224	<0.000200	0.0250	89.6	70 - 130	W210087	12-Mar-12	
EPA 200.8	Copper	mg/L	0.0254	0.00115	0.0250	97.1	70 - 130	W210087	12-Mar-12	
EPA 200.8	Lead	mg/L	0.0252	<0.00300	0.0250	95.5	70 - 130	W210087	12-Mar-12	
EPA 200.8	Selenium	mg/L	0.0249	<0.00300	0.0250	99.8	70 - 130	W210087	12-Mar-12	
EPA 200.8	Silver	mg/L	0.0251	<0.000100	0.0250	100	70 - 130	W210087	12-Mar-12	
EPA 200.8	Uranium	mg/L	0.0249	<0.00100	0.0250	98.4	70 - 130	W210087	12-Mar-12	
EPA 200.8	Thallium	mg/L	0.0241	<0.00100	0.0250	96.5	70 - 130	W210087	12-Mar-12	
EPA 200.8	Cadmium	mg/L	0.0255	<0.00020	0.0250	102	70 - 130	W210087	12-Mar-12	

Metals (Dissolved)

EPA 200.7	Aluminum	mg/L	1.15	0.188	1.00	96.5	70 - 130	W210080	20-Mar-12	
EPA 200.7	Aluminum	mg/L	0.973	<0.080	1.00	97.3	70 - 130	W210080	20-Mar-12	
EPA 200.7	Barium	mg/L	1.01	0.0066	1.00	100	70 - 130	W210080	20-Mar-12	
EPA 200.7	Barium	mg/L	1.04	0.0276	1.00	101	70 - 130	W210080	20-Mar-12	
EPA 200.7	Boron	mg/L	1.00	<0.040	1.00	100	70 - 130	W210080	20-Mar-12	
EPA 200.7	Boron	mg/L	1.00	<0.040	1.00	99.2	70 - 130	W210080	20-Mar-12	
EPA 200.7	Calcium	mg/L	330	319	20.0	R > 4S	70 - 130	W210080	20-Mar-12	M3
EPA 200.7	Calcium	mg/L	51.6	32.7	20.0	94.7	70 - 130	W210080	20-Mar-12	
EPA 200.7	Chromium	mg/L	0.999	<0.0060	1.00	99.4	70 - 130	W210080	20-Mar-12	
EPA 200.7	Chromium	mg/L	0.999	<0.0060	1.00	99.6	70 - 130	W210080	20-Mar-12	
EPA 200.7	Cobalt	mg/L	0.963	<0.0060	1.00	96.3	70 - 130	W210080	20-Mar-12	
EPA 200.7	Cobalt	mg/L	0.964	<0.0060	1.00	96.1	70 - 130	W210080	20-Mar-12	
EPA 200.7	Iron	mg/L	9.32	<0.060	10.0	93.2	70 - 130	W210080	20-Mar-12	
EPA 200.7	Iron	mg/L	10.3	0.892	10.0	93.6	70 - 130	W210080	20-Mar-12	
EPA 200.7	Magnesium	mg/L	19.4	0.647	20.0	93.6	70 - 130	W210080	20-Mar-12	
EPA 200.7	Magnesium	mg/L	36.0	17.3	20.0	93.7	70 - 130	W210080	20-Mar-12	
EPA 200.7	Manganese	mg/L	0.950	<0.0040	1.00	95.0	70 - 130	W210080	20-Mar-12	
EPA 200.7	Manganese	mg/L	1.61	0.665	1.00	94.6	70 - 130	W210080	20-Mar-12	
EPA 200.7	Molybdenum	mg/L	1.47	0.464	1.00	100	70 - 130	W210080	20-Mar-12	
EPA 200.7	Molybdenum	mg/L	0.985	0.013	1.00	97.3	70 - 130	W210080	20-Mar-12	
EPA 200.7	Nickel	mg/L	0.974	<0.010	1.00	97.4	70 - 130	W210080	20-Mar-12	
EPA 200.7	Nickel	mg/L	0.970	<0.010	1.00	97.0	70 - 130	W210080	20-Mar-12	
EPA 200.7	Potassium	mg/L	31.3	11.7	20.0	97.6	70 - 130	W210080	20-Mar-12	
EPA 200.7	Potassium	mg/L	20.2	0.69	20.0	97.6	70 - 130	W210080	20-Mar-12	
EPA 200.7	Silicon	mg/L	6.95	2.14	5.00	96.0	70 - 130	W210080	20-Mar-12	
EPA 200.7	Silicon	mg/L	34.9	30.3	5.00	91.1	70 - 130	W210080	20-Mar-12	
EPA 200.7	Sodium	mg/L	38.2	19.9	19.0	96.1	70 - 130	W210080	20-Mar-12	
EPA 200.7	Sodium	mg/L	39.8	21.2	19.0	97.9	70 - 130	W210080	20-Mar-12	
EPA 200.7	Titanium	mg/L	0.989	<0.0050	1.00	98.9	70 - 130	W210080	20-Mar-12	
EPA 200.7	Titanium	mg/L	0.984	<0.0050	1.00	98.4	70 - 130	W210080	20-Mar-12	
EPA 200.7	Vanadium	mg/L	1.02	<0.0050	1.00	102	70 - 130	W210080	20-Mar-12	
EPA 200.7	Vanadium	mg/L	1.01	<0.0050	1.00	101	70 - 130	W210080	20-Mar-12	
EPA 200.7	Zinc	mg/L	0.974	<0.0100	1.00	97.4	70 - 130	W210080	20-Mar-12	
EPA 200.7	Zinc	mg/L	0.983	<0.0100	1.00	98.3	70 - 130	W210080	20-Mar-12	
EPA 200.8	Antimony	mg/L	0.0254	<0.00300	0.0250	101	70 - 130	W210089	14-Mar-12	
EPA 200.8	Arsenic	mg/L	0.0260	<0.0030	0.0250	99.9	70 - 130	W210089	14-Mar-12	
EPA 200.8	Beryllium	mg/L	0.0224	<0.000200	0.0250	89.4	70 - 130	W210089	14-Mar-12	
EPA 200.8	Cadmium	mg/L	0.0231	<0.00020	0.0250	92.3	70 - 130	W210089	14-Mar-12	
EPA 200.8	Copper	mg/L	0.0238	<0.00100	0.0250	94.2	70 - 130	W210089	14-Mar-12	
EPA 200.8	Lead	mg/L	0.0218	<0.00300	0.0250	87.1	70 - 130	W210089	14-Mar-12	
EPA 200.8	Selenium	mg/L	0.0253	<0.00300	0.0250	100	70 - 130	W210089	14-Mar-12	
EPA 200.8	Silver	mg/L	0.0236	<0.000100	0.0250	94.4	70 - 130	W210089	14-Mar-12	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2C0061**
Reported: 21-Mar-12 10:08

Quality Control - MATRIX SPIKE Data (Continued)

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Dissolved) (Continued)

EPA 200.8	Thallium	mg/L	0.0219	<0.00100	0.0250	87.5	70 - 130	W210089	14-Mar-12	
EPA 200.8	Uranium	mg/L	0.0226	<0.00100	0.0250	89.6	70 - 130	W210089	14-Mar-12	
EPA 245.1	Mercury	mg/L	0.00095	<0.00020	0.00100	95.0	70 - 130	W210183	08-Mar-12	
EPA 245.1	Mercury	mg/L	0.00098	<0.00020	0.00100	98.0	70 - 130	W210312	12-Mar-12	
EPA 245.1	Mercury	mg/L	0.00097	<0.00020	0.00100	97.0	70 - 130	W210312	12-Mar-12	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	mg/L	0.117	<0.005	0.100	117	85 - 115	W210178	07-Mar-12	M1
ASTM D7237	Cyanide (free)	mg/L	0.098	<0.005	0.100	98.5	85 - 115	W210309	09-Mar-12	
EPA 335.4	Cyanide (total)	mg/L	0.0970	<0.0100	0.100	97.0	90 - 110	W210228	09-Mar-12	
EPA 335.4	Cyanide (total)	mg/L	0.0920	<0.0100	0.100	92.0	90 - 110	W210228	09-Mar-12	
EPA 350.1	Ammonia as N	mg/L	0.508	<0.030	0.500	96.0	90 - 110	W211199	19-Mar-12	
EPA 350.1	Ammonia as N	mg/L	23.6	23.4	0.500	R > 4S	90 - 110	W211199	19-Mar-12	D2,M3
EPA 353.2	Nitrate/Nitrite as N	mg/L	1.06	<0.050	1.00	106	90 - 110	W211257	19-Mar-12	
EPA 353.2	Nitrate/Nitrite as N	mg/L	3.38	2.35	1.00	104	90 - 110	W211257	19-Mar-12	
SM 4500-CN-I	Cyanide (WAD)	mg/L	0.116	<0.0100	0.100	110	75 - 125	W210289	09-Mar-12	
SM 4500-CN-I	Cyanide (WAD)	mg/L	0.104	<0.0100	0.100	103	75 - 125	W210289	09-Mar-12	
SM 4500-P-E	Phosphorus	mg/L	0.622	0.130	0.500	98.4	75 - 125	W210252	08-Mar-12	

Anions by Ion Chromatography

EPA 300.0	Fluoride	mg/L	1.99	<0.10	2.00	95.8	90 - 110	W211069	12-Mar-12	
EPA 300.0	Fluoride	mg/L	2.03	0.17	2.00	93.1	90 - 110	W211069	12-Mar-12	
EPA 300.0	Chloride	mg/L	7.19	3.91	3.00	109	90 - 110	W211069	12-Mar-12	
EPA 300.0	Chloride	mg/L	8.12	4.83	3.00	110	90 - 110	W211069	12-Mar-12	
EPA 300.0	Sulfate as SO4	mg/L	20.0	8.96	10.0	110	90 - 110	W211069	12-Mar-12	
EPA 300.0	Sulfate as SO4	mg/L	12.1	1.12	10.0	109	90 - 110	W211069	13-Mar-12	

Quality Control - MATRIX SPIKE DUPLICATE Data

Method	Analyte	Units	MSD Result	Spike Result	Spike Level	RPD	RPD Limit	Batch ID	Analyzed	Notes
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Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	mg/L	0.104	0.117	0.100	12.6	20	W210178	07-Mar-12	
ASTM D7237	Cyanide (free)	mg/L	0.101	0.098	0.100	3.0	20	W210309	09-Mar-12	

Quality Control - POST DIGESTION SPIKE Data

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	mg/L	1.26	0.158	1.00	110	85 - 115	W210083	19-Mar-12	
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Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2C0061**
Reported: 21-Mar-12 10:08

Notes and Definitions

D2	Sample required dilution due to high concentration of target analyte.
D5	Sample required dilution to meet internal standard recovery limits.
H3	Sample was received and analyzed past holding time.
H5	This test is specified to be performed in the field within 15 minutes of sampling; sample was received and analyzed past the regulatory holding time.
M1	Matrix spike recovery was high, but the LCS recovery was acceptable.
M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to spike level. The LCS was acceptable.
N1	See case narrative.
R1	RPD exceeded the method acceptance limit.
R2	RPD exceeded the laboratory acceptance limit.
LCS	Laboratory Control Sample (Blank Spike)
RPD	Relative Percent Difference
UDL	A result is less than the detection limit
R > 4S	% recovery not applicable, sample concentration more than four times greater than spike level
<RL	A result is less than the reporting limit
MRL	Method Reporting Limit
MDL	Method Detection Limit
N/A	Not Applicable



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: W2D0302

Reported: 03-May-12 15:49

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Sampled By	Date Received
27MAR12GW001	W2D0302-01	Ground Water	27-Mar-12 10:00	JW	16-Apr-2012
27MAR12GW002	W2D0302-02	Ground Water	27-Mar-12 11:00	JW	16-Apr-2012
27MAR12GW003	W2D0302-03	Ground Water	27-Mar-12 16:15	JW	16-Apr-2012
28MAR12GW004	W2D0302-04	Ground Water	28-Mar-12 10:45	JW	16-Apr-2012
28MAR12GW005	W2D0302-05	Ground Water	28-Mar-12 15:00	JW	16-Apr-2012
28MAR12GW006	W2D0302-06	Ground Water	28-Mar-12 16:10	JW	16-Apr-2012
29MAR12GW007	W2D0302-07	Ground Water	29-Mar-12 11:30	JW	16-Apr-2012
29MAR12GW107	W2D0302-08	Ground Water	29-Mar-12 11:30	JW	16-Apr-2012
29MAR12GW008	W2D0302-09	Ground Water	29-Mar-12 17:00	JW	16-Apr-2012
30MAR12GW009	W2D0302-10	Ground Water	30-Mar-12 11:00	JW	16-Apr-2012
NADD1298GW001	W2D0302-11	Ground Water	28-Mar-12 15:45	JW	16-Apr-2012

Solid samples are analyzed on an as-received, wet-weight basis, unless otherwise requested. Non-Detects are reported at the MDL.

Sample preparation is defined by the client as per their Data Quality Objectives.

This report supercedes any previous reports for this Work Order. The complete report includes pages for each sample, a full QC report, and a notes section.

The results presented in this report relate only to the samples, and meet all requirements of the NELAC Standards unless otherwise noted.

(Q6) SVL received the following containers outside of published EPA guidelines for preservation temperatures (0-6°C).

The guidelines do not pertain to nitric-preserved metals.

Default Cooler (Received Temperature: 12.8°C)

Labnumber	Container	Client ID	Labnumber	Container	Client ID
W2D0302-01 A	Raw HDPE	27MAR12GW001	W2D0302-01 B	Sulfuric HDPE	27MAR12GW001
W2D0302-01 C	Filtered nitric HDPE	27MAR12GW001	W2D0302-01 D	Nitric HDPE	27MAR12GW001
W2D0302-01 E	NaOH HDPE	27MAR12GW001	W2D0302-02 A	Raw HDPE	27MAR12GW002
W2D0302-02 B	Sulfuric HDPE	27MAR12GW002	W2D0302-02 C	Filtered nitric HDPE	27MAR12GW002
W2D0302-02 D	Nitric HDPE	27MAR12GW002	W2D0302-02 E	NaOH HDPE	27MAR12GW002
W2D0302-03 A	Raw HDPE	27MAR12GW003	W2D0302-03 B	Sulfuric HDPE	27MAR12GW003
W2D0302-03 C	Filtered nitric HDPE	27MAR12GW003	W2D0302-03 D	Nitric HDPE	27MAR12GW003
W2D0302-03 E	NaOH HDPE	27MAR12GW003	W2D0302-04 A	Raw HDPE	28MAR12GW004
W2D0302-04 B	Sulfuric HDPE	28MAR12GW004	W2D0302-04 C	Filtered nitric HDPE	28MAR12GW004
W2D0302-04 D	Nitric HDPE	28MAR12GW004	W2D0302-04 E	NaOH HDPE	28MAR12GW004
W2D0302-05 A	Raw HDPE	28MAR12GW005	W2D0302-05 B	Sulfuric HDPE	28MAR12GW005
W2D0302-05 C	Filtered nitric HDPE	28MAR12GW005	W2D0302-05 D	Nitric HDPE	28MAR12GW005
W2D0302-05 E	NaOH HDPE	28MAR12GW005	W2D0302-06 A	Raw HDPE	28MAR12GW006
W2D0302-06 B	Sulfuric HDPE	28MAR12GW006	W2D0302-06 C	Filtered nitric HDPE	28MAR12GW006
W2D0302-06 D	Nitric HDPE	28MAR12GW006	W2D0302-06 E	NaOH HDPE	28MAR12GW006
W2D0302-07 A	Raw HDPE	29MAR12GW007	W2D0302-07 B	Sulfuric HDPE	29MAR12GW007
W2D0302-07 C	Filtered nitric HDPE	29MAR12GW007	W2D0302-07 D	Nitric HDPE	29MAR12GW007
W2D0302-07 E	NaOH HDPE	29MAR12GW007	W2D0302-08 A	Raw HDPE	29MAR12GW107
W2D0302-08 B	Sulfuric HDPE	29MAR12GW107	W2D0302-08 C	Filtered nitric HDPE	29MAR12GW107
W2D0302-08 D	Nitric HDPE	29MAR12GW107	W2D0302-08 E	NaOH HDPE	29MAR12GW107
W2D0302-09 A	Raw HDPE	29MAR12GW008	W2D0302-09 B	Sulfuric HDPE	29MAR12GW008
W2D0302-09 C	Filtered nitric HDPE	29MAR12GW008	W2D0302-09 D	Nitric HDPE	29MAR12GW008
W2D0302-09 E	NaOH HDPE	29MAR12GW008	W2D0302-10 A	Raw HDPE	30MAR12GW009
W2D0302-10 B	Sulfuric HDPE	30MAR12GW009	W2D0302-10 C	Filtered nitric HDPE	30MAR12GW009
W2D0302-10 D	Nitric HDPE	30MAR12GW009	W2D0302-10 E	NaOH HDPE	30MAR12GW009
W2D0302-11 A	Raw HDPE	NADD1298GW001	W2D0302-11 B	Sulfuric HDPE	NADD1298GW001
W2D0302-11 C	Filtered nitric HDPE	NADD1298GW001	W2D0302-11 D	Nitric HDPE	NADD1298GW001
W2D0302-11 E	NaOH HDPE	NADD1298GW001	W2D0302-11 F	Sulfuric VOA	NADD1298GW001
W2D0302-11 G	Sulfuric VOA	NADD1298GW001			

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268

Work order Report Page 1 of 44



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

(208) 784-1258

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Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W2D0302**

Reported: 03-May-12 15:49



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: W2D0302

Reported: 03-May-12 15:49

Client Sample ID: 27MAR12GW001

SVL Sample ID: W2D0302-01 (Ground Water)

Sample Report Page 1 of 3

Sampled: 27-Mar-12 10:00

Received: 16-Apr-12

Sampled By: JW

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000054		W216275	DJA	04/23/12 13:57	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	0.281	mg/L	0.080	0.008		W216078	AS	04/30/12 16:27	
EPA 200.7	Barium	0.0063	mg/L	0.0020	0.0002		W216078	AS	04/30/12 16:27	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.004		W216078	AS	04/30/12 16:27	
EPA 200.7	Calcium	0.323	mg/L	0.040	0.006		W216078	AS	04/30/12 16:27	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0004		W216078	AS	04/30/12 16:27	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0006		W216078	AS	04/30/12 16:27	
EPA 200.7	Iron	0.402	mg/L	0.060	0.011		W216078	AS	04/30/12 16:27	
EPA 200.7	Magnesium	0.135	mg/L	0.060	0.013		W216078	AS	04/30/12 16:27	
EPA 200.7	Manganese	0.0418	mg/L	0.0040	0.0006		W216078	AS	04/30/12 16:27	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W216078	AS	04/30/12 16:27	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W216078	AS	04/30/12 16:27	
EPA 200.7	Potassium	0.85	mg/L	0.50	0.03		W216078	AS	04/30/12 16:27	
EPA 200.7	Silicon	11.1	mg/L	0.08	0.01		W216078	AS	04/30/12 16:27	
EPA 200.7	Sodium	12.2	mg/L	0.50	0.07		W216078	AS	04/30/12 16:27	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0001		W216078	AS	04/30/12 16:27	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0003		W216078	AS	04/30/12 16:27	
EPA 200.7	Zinc	0.0461	mg/L	0.0100	0.0010		W218096	DT	05/02/12 10:33	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W216084	KWH	04/30/12 09:11	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W216084	KWH	04/30/12 09:11	
EPA 200.8	Beryllium	< 0.000400	mg/L	0.000400	0.000192	5	W216084	KWH	04/30/12 09:47	D5
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.00002	2.5	W216084	KWH	04/30/12 09:11	
EPA 200.8	Copper	0.00169	mg/L	0.00100	0.00009	2.5	W216084	KWH	04/30/12 09:11	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000016	2.5	W216084	KWH	04/30/12 09:11	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W216084	KWH	04/30/12 09:11	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.000009	2.5	W216084	KWH	04/30/12 09:11	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000004	2.5	W216084	KWH	04/30/12 09:11	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000006	2.5	W216084	KWH	04/30/12 09:11	
SM 2340B	Hardness (as CaCO3)	1.16	mg/L	0.347	0.140		N/A		04/30/12 18:28	



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W2D0302**

Reported: 03-May-12 15:49

Client Sample ID: **27MAR12GW001**

SVL Sample ID: **W2D0302-01 (Ground Water)**

Sample Report Page 2 of 3

Sampled: 27-Mar-12 10:00
Received: 16-Apr-12
Sampled By: JW

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	0.120	mg/L	0.080	0.017		W216079	AS	04/30/12 18:28	
EPA 200.7	Barium	0.0030	mg/L	0.0020	0.0004		W216079	AS	04/30/12 18:28	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.008		W216079	AS	04/30/12 18:28	
EPA 200.7	Calcium	0.327	mg/L	0.040	0.013		W216079	AS	04/30/12 18:28	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0007		W216079	AS	04/30/12 18:28	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0012		W216079	AS	04/30/12 18:28	
EPA 200.7	Iron	0.156	mg/L	0.060	0.022		W216079	AS	04/30/12 18:28	
EPA 200.7	Magnesium	0.083	mg/L	0.060	0.026		W216079	AS	04/30/12 18:28	
EPA 200.7	Manganese	0.0272	mg/L	0.0040	0.0011		W216079	AS	04/30/12 18:28	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.002		W216079	AS	04/30/12 18:28	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.004		W216079	AS	04/30/12 18:28	
EPA 200.7	Potassium	0.90	mg/L	0.50	0.07		W216079	AS	04/30/12 18:28	
EPA 200.7	Silicon	10.9	mg/L	0.08	0.03		W216079	AS	04/30/12 18:28	
EPA 200.7	Sodium	12.3	mg/L	0.50	0.14		W216079	AS	04/30/12 18:28	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W216079	AS	04/30/12 18:28	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W216079	AS	04/30/12 18:28	
EPA 200.7	Zinc	0.0291	mg/L	0.0100	0.0019		W216079	AS	04/30/12 18:28	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W216085	KWH	04/30/12 08:04	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W216085	KWH	04/30/12 08:04	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000077		W216085	KWH	04/30/12 08:04	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.000013		W216085	KWH	04/30/12 08:04	
EPA 200.8	Copper	0.00107	mg/L	0.00100	0.000072		W216085	KWH	04/30/12 08:04	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000013		W216085	KWH	04/30/12 08:04	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W216085	KWH	04/30/12 08:04	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.0000074		W216085	KWH	04/30/12 08:04	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000033		W216085	KWH	04/30/12 08:04	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000049		W216085	KWH	04/30/12 08:04	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000054		W216273	DJA	04/23/12 13:57	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0005		W216257	IIT	04/19/12 16:29	H3
EPA 120.1	Specific conductance	75.3	µmhos/cm	5.00			W216086	RS	04/17/12 08:50	
EPA 180.1	Turbidity	2.28	NTU	0.100			W216076	SM	04/17/12 10:30	H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W216112	IIT	04/18/12 16:02	H3
EPA 350.1	Ammonia as N	0.077	mg/L	0.030	0.006		W216210	RHW	04/24/12 11:29	
EPA 353.2	Nitrate/Nitrite as N	0.277	mg/L	0.050	0.008		W217025	RHW	04/23/12 09:35	
SM 2320B/2310B	Bicarbonate	14.9	mg/L	1.0	0.1		W216176	DKS	04/19/12 14:44	H3
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.1		W216176	DKS	04/19/12 14:44	H3
SM 2320B/2310B	Total Alkalinity	14.9	mg/L	1.0	0.1		W216176	DKS	04/19/12 14:44	H3
SM 2540 C	Total Diss. Solids	78	mg/L	10			W216077	rs	04/17/12 11:35	H3
SM 2540 D	Total Susp. Solids	< 5.0	mg/L	5.0			W216088	RS	04/17/12 11:35	H3
SM 4500 H B	pH @24.0°C	6.03	pH Units				W216176	DKS	04/19/12 14:44	H3,H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W216113	IIT	04/18/12 18:34	H3
SM 4500-P-E	Phosphorus	0.010	mg/L	0.010	0.005		W216289	NCS	04/20/12 16:34	



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

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Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W2D0302**

Reported: 03-May-12 15:49

Client Sample ID: **27MAR12GW001**

SVL Sample ID: **W2D0302-01 (Ground Water)**

Sample Report Page 3 of 3

Sampled: 27-Mar-12 10:00

Received: 16-Apr-12

Sampled By: JW

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	4.05	mg/L	0.20	0.07		W217062	AEW	04/23/12 16:20	
EPA 300.0	Fluoride	< 0.10	mg/L	0.10	0.02		W217062	AEW	04/23/12 16:20	
EPA 300.0	Sulfate as SO4	7.45	mg/L	0.30	0.04		W217062	AEW	04/23/12 16:20	

Cation/Anion Balance and TDS Ratios

Cation Sum: 0.60 meq/L Anion Sum: 0.59 meq/L C/A Balance: 1.15 % Calculated TDS: 65 TDS/cTDS: 1.20 TDS/eC: 1.04

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Golder Associates (WA)
 18300 NE Union Hill Road, Suite 200
 Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W2D0302**

Reported: 03-May-12 15:49

Client Sample ID: **27MAR12GW002**

SVL Sample ID: **W2D0302-02 (Ground Water)**

Sample Report Page 1 of 3

Sampled: 27-Mar-12 11:00

Received: 16-Apr-12

Sampled By: JW

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total)										
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000054		W216275	DJA	04/23/12 13:59	
Metals (Total Recoverable--reportable as Total per 40 CFR 136)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.008		W216078	AS	04/30/12 16:42	
EPA 200.7	Barium	0.0088	mg/L	0.0020	0.0002		W216078	AS	04/30/12 16:42	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.004		W216078	AS	04/30/12 16:42	
EPA 200.7	Calcium	0.923	mg/L	0.040	0.006		W216078	AS	04/30/12 16:42	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0004		W216078	AS	04/30/12 16:42	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0006		W216078	AS	04/30/12 16:42	
EPA 200.7	Iron	0.078	mg/L	0.060	0.011		W216078	AS	04/30/12 16:42	
EPA 200.7	Magnesium	2.08	mg/L	0.060	0.013		W216078	AS	04/30/12 16:42	
EPA 200.7	Manganese	0.0380	mg/L	0.0040	0.0006		W216078	AS	04/30/12 16:42	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W216078	AS	04/30/12 16:42	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W216078	AS	04/30/12 16:42	
EPA 200.7	Potassium	< 0.50	mg/L	0.50	0.03		W216078	AS	04/30/12 16:42	
EPA 200.7	Silicon	8.34	mg/L	0.08	0.01		W216078	AS	04/30/12 16:42	
EPA 200.7	Sodium	3.75	mg/L	0.50	0.07		W216078	AS	04/30/12 16:42	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0001		W216078	AS	04/30/12 16:42	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0003		W216078	AS	04/30/12 16:42	
EPA 200.7	Zinc	0.0523	mg/L	0.0100	0.0010		W218096	DT	05/02/12 10:39	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W216084	KWH	04/30/12 09:17	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W216084	KWH	04/30/12 09:17	
EPA 200.8	Beryllium	< 0.000400	mg/L	0.000400	0.000192	5	W216084	KWH	04/30/12 09:58	D5
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.00002	2.5	W216084	KWH	04/30/12 09:17	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.00009	2.5	W216084	KWH	04/30/12 09:17	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000016	2.5	W216084	KWH	04/30/12 09:17	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W216084	KWH	04/30/12 09:17	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.000009	2.5	W216084	KWH	04/30/12 09:17	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000004	2.5	W216084	KWH	04/30/12 09:17	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000006	2.5	W216084	KWH	04/30/12 09:17	
SM 2340B	Hardness (as CaCO3)	11.2	mg/L	0.347	0.140		N/A		04/30/12 18:43	



Golder Associates (WA)
 18300 NE Union Hill Road, Suite 200
 Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W2D0302**

Reported: 03-May-12 15:49

Client Sample ID: **27MAR12GW002**

Sampled: 27-Mar-12 11:00

SVL Sample ID: **W2D0302-02 (Ground Water)**

Received: 16-Apr-12

Sample Report Page 2 of 3

Sampled By: JW

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.017		W216079	AS	04/30/12 18:43	
EPA 200.7	Barium	0.0089	mg/L	0.0020	0.0004		W216079	AS	04/30/12 18:43	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.008		W216079	AS	04/30/12 18:43	
EPA 200.7	Calcium	0.994	mg/L	0.040	0.013		W216079	AS	04/30/12 18:43	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0007		W216079	AS	04/30/12 18:43	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0012		W216079	AS	04/30/12 18:43	
EPA 200.7	Iron	< 0.060	mg/L	0.060	0.022		W216079	AS	04/30/12 18:43	
EPA 200.7	Magnesium	2.12	mg/L	0.060	0.026		W216079	AS	04/30/12 18:43	
EPA 200.7	Manganese	0.0406	mg/L	0.0040	0.0011		W216079	AS	04/30/12 18:43	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.002		W216079	AS	04/30/12 18:43	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.004		W216079	AS	04/30/12 18:43	
EPA 200.7	Potassium	< 0.50	mg/L	0.50	0.07		W216079	AS	04/30/12 18:43	
EPA 200.7	Silicon	8.32	mg/L	0.08	0.03		W216079	AS	04/30/12 18:43	
EPA 200.7	Sodium	3.74	mg/L	0.50	0.14		W216079	AS	04/30/12 18:43	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W216079	AS	04/30/12 18:43	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W216079	AS	04/30/12 18:43	
EPA 200.7	Zinc	0.0529	mg/L	0.0100	0.0019		W216079	AS	04/30/12 18:43	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W216085	KWH	04/30/12 08:10	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W216085	KWH	04/30/12 08:10	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000077		W216085	KWH	04/30/12 08:10	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.000013		W216085	KWH	04/30/12 08:10	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.000072		W216085	KWH	04/30/12 08:10	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000013		W216085	KWH	04/30/12 08:10	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W216085	KWH	04/30/12 08:10	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.0000074		W216085	KWH	04/30/12 08:10	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000033		W216085	KWH	04/30/12 08:10	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000049		W216085	KWH	04/30/12 08:10	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000054		W216273	DJA	04/23/12 13:59	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0005		W216257	IIT	04/19/12 16:31	H3
EPA 120.1	Specific conductance	49.3	µmhos/cm	5.00			W216086	RS	04/17/12 08:50	
EPA 180.1	Turbidity	0.973	NTU	0.100			W216076	SM	04/17/12 10:30	H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W216112	IIT	04/18/12 16:04	H3
EPA 350.1	Ammonia as N	0.054	mg/L	0.030	0.006		W216210	RHW	04/24/12 11:30	
EPA 353.2	Nitrate/Nitrite as N	0.133	mg/L	0.050	0.008		W217025	RHW	04/23/12 09:37	
SM 2320B/2310B	Bicarbonate	11.8	mg/L	1.0	0.1		W216176	DKS	04/19/12 13:10	H3
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.1		W216176	DKS	04/19/12 13:10	H3
SM 2320B/2310B	Total Alkalinity	11.8	mg/L	1.0	0.1		W216176	DKS	04/19/12 13:10	H3
SM 2540 C	Total Diss. Solids	42	mg/L	10			W216077	rs	04/17/12 11:35	H3
SM 2540 D	Total Susp. Solids	< 5.0	mg/L	5.0			W216088	RS	04/17/12 11:35	H3
SM 4500 H B	pH @24.0°C	5.70	pH Units				W216176	DKS	04/19/12 13:10	H3,H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W216113	IIT	04/18/12 18:36	H3
SM 4500-P-E	Phosphorus	0.014	mg/L	0.010	0.005		W216289	NCS	04/20/12 16:34	



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

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Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W2D0302**

Reported: 03-May-12 15:49

Client Sample ID: **27MAR12GW002**

SVL Sample ID: **W2D0302-02 (Ground Water)**

Sample Report Page 3 of 3

Sampled: 27-Mar-12 11:00

Received: 16-Apr-12

Sampled By: JW

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	4.16	mg/L	0.20	0.07		W217062	AEW	04/23/12 16:30	
EPA 300.0	Fluoride	< 0.10	mg/L	0.10	0.02		W217062	AEW	04/23/12 16:30	
EPA 300.0	Sulfate as SO4	0.84	mg/L	0.30	0.04		W217062	AEW	04/23/12 16:30	

Cation/Anion Balance and TDS Ratios

Cation Sum: 0.39 meq/L Anion Sum: 0.38 meq/L C/A Balance: 1.06 % Calculated TDS: 42 TDS/cTDS: 1.00 TDS/eC: 0.85

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Golder Associates (WA)
 18300 NE Union Hill Road, Suite 200
 Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W2D0302**

Reported: 03-May-12 15:49

Client Sample ID: **27MAR12GW003**

SVL Sample ID: **W2D0302-03 (Ground Water)**

Sample Report Page 1 of 3

Sampled: 27-Mar-12 16:15

Received: 16-Apr-12

Sampled By: JW

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total)										
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000054		W216275	DJA	04/23/12 14:00	
Metals (Total Recoverable--reportable as Total per 40 CFR 136)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.008		W216078	AS	04/30/12 16:48	
EPA 200.7	Barium	0.0220	mg/L	0.0020	0.0002		W216078	AS	04/30/12 16:48	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.004		W216078	AS	04/30/12 16:48	
EPA 200.7	Calcium	13.5	mg/L	0.040	0.006		W216078	AS	04/30/12 16:48	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0004		W216078	AS	04/30/12 16:48	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0006		W216078	AS	04/30/12 16:48	
EPA 200.7	Iron	1.93	mg/L	0.060	0.011		W216078	AS	04/30/12 16:48	
EPA 200.7	Magnesium	8.51	mg/L	0.060	0.013		W216078	AS	04/30/12 16:48	
EPA 200.7	Manganese	0.568	mg/L	0.0040	0.0006		W216078	AS	04/30/12 16:48	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W216078	AS	04/30/12 16:48	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W216078	AS	04/30/12 16:48	
EPA 200.7	Potassium	0.87	mg/L	0.50	0.03		W216078	AS	04/30/12 16:48	
EPA 200.7	Silicon	32.9	mg/L	0.08	0.01		W216078	AS	04/30/12 16:48	
EPA 200.7	Sodium	22.5	mg/L	0.50	0.07		W216078	AS	04/30/12 16:48	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0001		W216078	AS	04/30/12 16:48	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0003		W216078	AS	04/30/12 16:48	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0010		W218096	DT	05/02/12 10:55	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W216084	KWH	04/30/12 09:18	
EPA 200.8	Arsenic	0.0032	mg/L	0.0030	0.0003	2.5	W216084	KWH	04/30/12 09:18	
EPA 200.8	Beryllium	< 0.000400	mg/L	0.000400	0.000192	5	W216084	KWH	04/30/12 09:59	D5
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.00002	2.5	W216084	KWH	04/30/12 09:18	
EPA 200.8	Copper	0.00128	mg/L	0.00100	0.00009	2.5	W216084	KWH	04/30/12 09:18	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000016	2.5	W216084	KWH	04/30/12 09:18	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W216084	KWH	04/30/12 09:18	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.000009	2.5	W216084	KWH	04/30/12 09:18	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000004	2.5	W216084	KWH	04/30/12 09:18	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000006	2.5	W216084	KWH	04/30/12 09:18	
SM 2340B	Hardness (as CaCO3)	69.0	mg/L	0.347	0.140		N/A		04/30/12 18:49	



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W2D0302**

Reported: 03-May-12 15:49

Client Sample ID: **27MAR12GW003**

SVL Sample ID: **W2D0302-03 (Ground Water)**

Sample Report Page 2 of 3

Sampled: 27-Mar-12 16:15

Received: 16-Apr-12

Sampled By: JW

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.017		W216079	AS	04/30/12 18:49	
EPA 200.7	Barium	0.0220	mg/L	0.0020	0.0004		W216079	AS	04/30/12 18:49	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.008		W216079	AS	04/30/12 18:49	
EPA 200.7	Calcium	13.4	mg/L	0.040	0.013		W216079	AS	04/30/12 18:49	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0007		W216079	AS	04/30/12 18:49	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0012		W216079	AS	04/30/12 18:49	
EPA 200.7	Iron	1.86	mg/L	0.060	0.022		W216079	AS	04/30/12 18:49	
EPA 200.7	Magnesium	8.64	mg/L	0.060	0.026		W216079	AS	04/30/12 18:49	
EPA 200.7	Manganese	0.590	mg/L	0.0040	0.0011		W216079	AS	04/30/12 18:49	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.002		W216079	AS	04/30/12 18:49	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.004		W216079	AS	04/30/12 18:49	
EPA 200.7	Potassium	0.97	mg/L	0.50	0.07		W216079	AS	04/30/12 18:49	
EPA 200.7	Silicon	32.4	mg/L	0.08	0.03		W216079	AS	04/30/12 18:49	
EPA 200.7	Sodium	22.2	mg/L	0.50	0.14		W216079	AS	04/30/12 18:49	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W216079	AS	04/30/12 18:49	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W216079	AS	04/30/12 18:49	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0019		W216079	AS	04/30/12 18:49	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W216085	KWH	04/30/12 08:12	
EPA 200.8	Arsenic	0.0034	mg/L	0.0030	0.0002		W216085	KWH	04/30/12 08:12	
EPA 200.8	Beryllium	< 0.000320	mg/L	0.000320	0.000154	2	W216085	KWH	04/30/12 08:41	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.000013		W216085	KWH	04/30/12 08:12	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.000072		W216085	KWH	04/30/12 08:12	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000013		W216085	KWH	04/30/12 08:12	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W216085	KWH	04/30/12 08:12	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.0000074		W216085	KWH	04/30/12 08:12	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000033		W216085	KWH	04/30/12 08:12	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000049		W216085	KWH	04/30/12 08:12	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000054		W216273	DJA	04/23/12 14:00	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0005		W216257	IIT	04/19/12 16:33	H3
EPA 120.1	Specific conductance	269	µmhos/cm	5.00			W216086	RS	04/17/12 08:50	
EPA 180.1	Turbidity	6.53	NTU	0.100			W216076	SM	04/17/12 10:30	H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W216112	IIT	04/18/12 16:06	H3
EPA 350.1	Ammonia as N	0.102	mg/L	0.030	0.006		W216210	RHW	04/24/12 11:31	
EPA 353.2	Nitrate/Nitrite as N	< 0.050	mg/L	0.050	0.008		W217025	RHW	04/23/12 09:38	
SM 2320B/2310B	Bicarbonate	108	mg/L	1.0	0.1		W216176	DKS	04/19/12 11:30	H3
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.1		W216176	DKS	04/19/12 11:30	H3
SM 2320B/2310B	Total Alkalinity	108	mg/L	1.0	0.1		W216176	DKS	04/19/12 11:30	H3
SM 2540 C	Total Diss. Solids	181	mg/L	10			W216077	rs	04/17/12 11:35	H3
SM 2540 D	Total Susp. Solids	9.0	mg/L	5.0			W216088	RS	04/17/12 11:35	H3
SM 4500 H B	pH @23.0°C	6.95	pH Units				W216176	DKS	04/19/12 11:30	H3,H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W216261	IIT	04/19/12 19:15	H3,N3
SM 4500-P-E	Phosphorus	0.331	mg/L	0.010	0.005		W216289	NCS	04/20/12 16:34	



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

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Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W2D0302**

Reported: 03-May-12 15:49

Client Sample ID: **27MAR12GW003**

SVL Sample ID: **W2D0302-03 (Ground Water)**

Sample Report Page 3 of 3

Sampled: 27-Mar-12 16:15

Received: 16-Apr-12

Sampled By: JW

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	9.75	mg/L	0.20	0.07		W217062	AEW	04/23/12 16:41	
EPA 300.0	Fluoride	0.17	mg/L	0.10	0.02		W217062	AEW	04/23/12 16:41	
EPA 300.0	Sulfate as SO4	1.43	mg/L	0.30	0.04		W217062	AEW	04/23/12 16:41	

Cation/Anion Balance and TDS Ratios

Cation Sum: 2.45 meq/L Anion Sum: 2.47 meq/L C/A Balance: -0.40 % Calculated TDS: 210 TDS/cTDS: 0.86 TDS/eC: 0.67

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

(208) 784-1258

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Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W2D0302**

Reported: 03-May-12 15:49

Client Sample ID: **28MAR12GW004**

SVL Sample ID: **W2D0302-04 (Ground Water)**

Sample Report Page 1 of 3

Sampled: 28-Mar-12 10:45

Received: 16-Apr-12

Sampled By: JW

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total)										
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000054		W216275	DJA	04/23/12 14:02	
Metals (Total Recoverable--reportable as Total per 40 CFR 136)										
EPA 200.7	Aluminum	9.09	mg/L	0.080	0.008		W216078	AS	04/30/12 16:53	
EPA 200.7	Barium	0.0490	mg/L	0.0020	0.0002		W216078	AS	04/30/12 16:53	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.004		W216078	AS	04/30/12 16:53	
EPA 200.7	Calcium	5.68	mg/L	0.040	0.006		W216078	AS	04/30/12 16:53	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0004		W216078	AS	04/30/12 16:53	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0006		W216078	AS	04/30/12 16:53	
EPA 200.7	Iron	4.35	mg/L	0.060	0.011		W216078	AS	04/30/12 16:53	
EPA 200.7	Magnesium	2.38	mg/L	0.060	0.013		W216078	AS	04/30/12 16:53	
EPA 200.7	Manganese	0.200	mg/L	0.0040	0.0006		W216078	AS	04/30/12 16:53	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W216078	AS	04/30/12 16:53	
EPA 200.7	Nickel	0.011	mg/L	0.010	0.002		W216078	AS	04/30/12 16:53	
EPA 200.7	Potassium	2.18	mg/L	0.50	0.03		W216078	AS	04/30/12 16:53	
EPA 200.7	Silicon	26.8	mg/L	0.08	0.01		W216078	AS	04/30/12 16:53	
EPA 200.7	Sodium	31.8	mg/L	0.50	0.07		W216078	AS	04/30/12 16:53	
EPA 200.7	Titanium	0.0126	mg/L	0.0050	0.0001		W216078	AS	04/30/12 16:53	
EPA 200.7	Vanadium	0.0053	mg/L	0.0050	0.0003		W216078	AS	04/30/12 16:53	
EPA 200.7	Zinc	0.121	mg/L	0.0100	0.0010		W218096	DT	05/02/12 11:01	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W216084	KWH	04/30/12 09:20	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W216084	KWH	04/30/12 09:20	
EPA 200.8	Beryllium	0.00110	mg/L	0.000400	0.000192	5	W216084	KWH	04/30/12 10:01	D5
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.00002	2.5	W216084	KWH	04/30/12 09:20	
EPA 200.8	Copper	0.00559	mg/L	0.00100	0.00009	2.5	W216084	KWH	04/30/12 09:20	
EPA 200.8	Lead	0.00784	mg/L	0.00300	0.000016	2.5	W216084	KWH	04/30/12 09:20	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W216084	KWH	04/30/12 09:20	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.000009	2.5	W216084	KWH	04/30/12 09:20	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000004	2.5	W216084	KWH	04/30/12 09:20	
EPA 200.8	Uranium	0.00256	mg/L	0.00100	0.000006	2.5	W216084	KWH	04/30/12 09:20	
SM 2340B	Hardness (as CaCO3)	5.23	mg/L	0.347	0.140		N/A		04/30/12 18:54	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W2D0302**

Reported: 03-May-12 15:49

Client Sample ID: **28MAR12GW004**

Sampled: 28-Mar-12 10:45

SVL Sample ID: **W2D0302-04 (Ground Water)**

Received: 16-Apr-12

Sample Report Page 2 of 3

Sampled By: JW

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	0.131	mg/L	0.080	0.017		W216079	AS	04/30/12 18:54	
EPA 200.7	Barium	0.0092	mg/L	0.0020	0.0004		W216079	AS	04/30/12 18:54	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.008		W216079	AS	04/30/12 18:54	
EPA 200.7	Calcium	1.63	mg/L	0.040	0.013		W216079	AS	04/30/12 18:54	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0007		W216079	AS	04/30/12 18:54	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0012		W216079	AS	04/30/12 18:54	
EPA 200.7	Iron	0.341	mg/L	0.060	0.022		W216079	AS	04/30/12 18:54	
EPA 200.7	Magnesium	0.285	mg/L	0.060	0.026		W216079	AS	04/30/12 18:54	
EPA 200.7	Manganese	0.0561	mg/L	0.0040	0.0011		W216079	AS	04/30/12 18:54	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.002		W216079	AS	04/30/12 18:54	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.004		W216079	AS	04/30/12 18:54	
EPA 200.7	Potassium	1.50	mg/L	0.50	0.07		W216079	AS	04/30/12 18:54	
EPA 200.7	Silicon	7.74	mg/L	0.08	0.03		W216079	AS	04/30/12 18:54	
EPA 200.7	Sodium	29.8	mg/L	0.50	0.14		W216079	AS	04/30/12 18:54	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W216079	AS	04/30/12 18:54	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W216079	AS	04/30/12 18:54	
EPA 200.7	Zinc	0.0260	mg/L	0.0100	0.0019		W216079	AS	04/30/12 18:54	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W216085	KWH	04/30/12 08:14	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W216085	KWH	04/30/12 08:14	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000077		W216085	KWH	04/30/12 08:14	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.000013		W216085	KWH	04/30/12 08:14	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.000072		W216085	KWH	04/30/12 08:14	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000013		W216085	KWH	04/30/12 08:14	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W216085	KWH	04/30/12 08:14	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.0000074		W216085	KWH	04/30/12 08:14	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000033		W216085	KWH	04/30/12 08:14	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000049		W216085	KWH	04/30/12 08:14	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000054		W216273	DJA	04/23/12 14:02	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0005		W216257	IIT	04/19/12 16:35	H3
EPA 120.1	Specific conductance	179	µmhos/cm	5.00			W216086	RS	04/17/12 08:50	
EPA 180.1	Turbidity	145	NTU	1.00		10	W216076	SM	04/17/12 10:30	D2,H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W216112	IIT	04/18/12 16:08	H3
EPA 350.1	Ammonia as N	0.533	mg/L	0.030	0.006		W216209	RHW	04/24/12 13:39	
EPA 353.2	Nitrate/Nitrite as N	< 0.050	mg/L	0.050	0.008		W217025	RHW	04/23/12 09:40	
SM 2320B/2310B	Bicarbonate	60.2	mg/L	1.0	0.1		W216176	DKS	04/19/12 11:35	H3
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.1		W216176	DKS	04/19/12 11:35	H3
SM 2320B/2310B	Total Alkalinity	60.2	mg/L	1.0	0.1		W216176	DKS	04/19/12 11:35	H3
SM 2540 C	Total Diss. Solids	156	mg/L	40			W218190	JMS	05/02/12 16:39	H3
SM 2540 D	Total Susp. Solids	252	mg/L	20.0			W216088	RS	04/17/12 11:35	H3
SM 4500 H B	pH @24.0°C	6.60	pH Units				W216176	DKS	04/19/12 11:35	H3,H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W216113	IIT	04/18/12 18:46	H3
SM 4500-P-E	Phosphorus	0.167	mg/L	0.010	0.005		W216289	NCS	04/20/12 16:34	



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

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Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W2D0302**

Reported: 03-May-12 15:49

Client Sample ID: **28MAR12GW004**

SVL Sample ID: **W2D0302-04 (Ground Water)**

Sample Report Page 3 of 3

Sampled: 28-Mar-12 10:45

Received: 16-Apr-12

Sampled By: JW

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	5.21	mg/L	0.20	0.07		W217062	AEW	04/23/12 17:01	
EPA 300.0	Fluoride	0.14	mg/L	0.10	0.02		W217062	AEW	04/23/12 17:01	
EPA 300.0	Sulfate as SO4	9.95	mg/L	0.30	0.04		W217062	AEW	04/23/12 17:01	

Cation/Anion Balance and TDS Ratios

Cation Sum: 1.51 meq/L Anion Sum: 1.56 meq/L C/A Balance: -1.88 % Calculated TDS: 136 TDS/cTDS: 1.15 TDS/eC: 0.87

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Golder Associates (WA)
 18300 NE Union Hill Road, Suite 200
 Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W2D0302**

Reported: 03-May-12 15:49

Client Sample ID: **28MAR12GW005**

SVL Sample ID: **W2D0302-05 (Ground Water)**

Sample Report Page 1 of 3

Sampled: 28-Mar-12 15:00

Received: 16-Apr-12

Sampled By: JW

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total)										
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000054		W216275	DJA	04/23/12 14:04	
Metals (Total Recoverable--reportable as Total per 40 CFR 136)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.008		W216078	AS	04/30/12 16:58	
EPA 200.7	Barium	0.148	mg/L	0.0020	0.0002		W216078	AS	04/30/12 16:58	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.004		W216078	AS	04/30/12 16:58	
EPA 200.7	Calcium	25.2	mg/L	0.040	0.006		W216078	AS	04/30/12 16:58	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0004		W216078	AS	04/30/12 16:58	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0006		W216078	AS	04/30/12 16:58	
EPA 200.7	Iron	1.46	mg/L	0.060	0.011		W216078	AS	04/30/12 16:58	
EPA 200.7	Magnesium	7.90	mg/L	0.060	0.013		W216078	AS	04/30/12 16:58	
EPA 200.7	Manganese	2.50	mg/L	0.0040	0.0006		W216078	AS	04/30/12 16:58	
EPA 200.7	Molybdenum	0.010	mg/L	0.008	0.001		W216078	AS	04/30/12 16:58	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W216078	AS	04/30/12 16:58	
EPA 200.7	Potassium	0.92	mg/L	0.50	0.03		W216078	AS	04/30/12 16:58	
EPA 200.7	Silicon	14.4	mg/L	0.08	0.01		W216078	AS	04/30/12 16:58	
EPA 200.7	Sodium	26.1	mg/L	0.50	0.07		W216078	AS	04/30/12 16:58	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0001		W216078	AS	04/30/12 16:58	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0003		W216078	AS	04/30/12 16:58	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0010		W218096	DT	05/02/12 11:06	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W216084	KWH	04/30/12 09:22	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W216084	KWH	04/30/12 09:22	
EPA 200.8	Beryllium	< 0.000400	mg/L	0.000400	0.000192	5	W216084	KWH	04/30/12 10:03	D5
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.00002	2.5	W216084	KWH	04/30/12 09:22	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.00009	2.5	W216084	KWH	04/30/12 09:22	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000016	2.5	W216084	KWH	04/30/12 09:22	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W216084	KWH	04/30/12 09:22	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.000009	2.5	W216084	KWH	04/30/12 09:22	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000004	2.5	W216084	KWH	04/30/12 09:22	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000006	2.5	W216084	KWH	04/30/12 09:22	
SM 2340B	Hardness (as CaCO3)	96.4	mg/L	0.347	0.140		N/A		04/30/12 19:10	



Golder Associates (WA)
 18300 NE Union Hill Road, Suite 200
 Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W2D0302**

Reported: 03-May-12 15:49

Client Sample ID: **28MAR12GW005**

SVL Sample ID: **W2D0302-05 (Ground Water)**

Sample Report Page 2 of 3

Sampled: 28-Mar-12 15:00

Received: 16-Apr-12

Sampled By: JW

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.017		W216079	AS	04/30/12 19:10	
EPA 200.7	Barium	0.150	mg/L	0.0020	0.0004		W216079	AS	04/30/12 20:15	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.008		W216079	AS	04/30/12 19:10	
EPA 200.7	Calcium	25.3	mg/L	0.040	0.013		W216079	AS	04/30/12 19:10	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0007		W216079	AS	04/30/12 19:10	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0012		W216079	AS	04/30/12 19:10	
EPA 200.7	Iron	1.42	mg/L	0.060	0.022		W216079	AS	04/30/12 19:10	
EPA 200.7	Magnesium	8.10	mg/L	0.060	0.026		W216079	AS	04/30/12 19:10	
EPA 200.7	Manganese	2.50	mg/L	0.0040	0.0011		W216079	AS	04/30/12 19:10	
EPA 200.7	Molybdenum	0.010	mg/L	0.008	0.002		W216079	AS	04/30/12 19:10	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.004		W216079	AS	04/30/12 19:10	
EPA 200.7	Potassium	0.99	mg/L	0.50	0.07		W216079	AS	04/30/12 19:10	
EPA 200.7	Silicon	14.5	mg/L	0.08	0.03		W216079	AS	04/30/12 19:10	
EPA 200.7	Sodium	25.8	mg/L	0.50	0.14		W216079	AS	04/30/12 19:10	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W216079	AS	04/30/12 19:10	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W216079	AS	04/30/12 19:10	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0019		W216079	AS	04/30/12 19:10	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W216085	KWH	04/30/12 08:15	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W216085	KWH	04/30/12 08:15	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000077		W216085	KWH	04/30/12 08:15	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.000013		W216085	KWH	04/30/12 08:15	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.000072		W216085	KWH	04/30/12 08:15	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000013		W216085	KWH	04/30/12 08:15	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W216085	KWH	04/30/12 08:15	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.0000074		W216085	KWH	04/30/12 08:15	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000033		W216085	KWH	04/30/12 08:15	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000049		W216085	KWH	04/30/12 08:15	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000054		W216273	DJA	04/23/12 14:04	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0005		W216257	IIT	04/19/12 16:43	H3
EPA 120.1	Specific conductance	353	µmhos/cm	5.00			W216086	RS	04/17/12 08:50	
EPA 180.1	Turbidity	3.43	NTU	0.100			W216076	SM	04/17/12 10:30	H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W216112	IIT	04/18/12 16:16	H3
EPA 350.1	Ammonia as N	0.068	mg/L	0.030	0.006		W216209	RHW	04/24/12 13:41	
EPA 353.2	Nitrate/Nitrite as N	< 0.050	mg/L	0.050	0.008		W217025	RHW	04/23/12 09:47	
SM 2320B/2310B	Bicarbonate	158	mg/L	1.0	0.1		W216176	DKS	04/19/12 11:45	H3
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.1		W216176	DKS	04/19/12 11:45	H3
SM 2320B/2310B	Total Alkalinity	158	mg/L	1.0	0.1		W216176	DKS	04/19/12 11:45	H3
SM 2540 C	Total Diss. Solids	198	mg/L	10			W216077	rs	04/17/12 11:35	H3
SM 2540 D	Total Susp. Solids	< 5.0	mg/L	5.0			W216088	RS	04/17/12 11:35	H3
SM 4500 H B	pH @23.0°C	7.27	pH Units				W216176	DKS	04/19/12 11:45	H3,H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W216113	IIT	04/18/12 18:48	H3
SM 4500-P-E	Phosphorus	0.038	mg/L	0.010	0.005		W216289	NCS	04/20/12 16:34	



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Kellogg ID 83837-0929

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Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
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Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W2D0302**

Reported: 03-May-12 15:49

Client Sample ID: **28MAR12GW005**

SVL Sample ID: **W2D0302-05 (Ground Water)**

Sample Report Page 3 of 3

Sampled: 28-Mar-12 15:00

Received: 16-Apr-12

Sampled By: JW

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	6.50	mg/L	0.20	0.07		W217062	AEW	04/23/12 17:22	
EPA 300.0	Fluoride	0.12	mg/L	0.10	0.02		W217062	AEW	04/23/12 17:22	
EPA 300.0	Sulfate as SO4	0.80	mg/L	0.30	0.04		W217062	AEW	04/23/12 17:22	

Cation/Anion Balance and TDS Ratios

Cation Sum: 3.20 meq/L Anion Sum: 3.36 meq/L C/A Balance: -2.45 % Calculated TDS: 202 TDS/cTDS: 0.98 TDS/eC: 0.56

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: W2D0302

Reported: 03-May-12 15:49

Client Sample ID: 28MAR12GW006

SVL Sample ID: W2D0302-06 (Ground Water)

Sample Report Page 1 of 3

Sampled: 28-Mar-12 16:10

Received: 16-Apr-12

Sampled By: JW

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000054		W216276	DJA	04/23/12 16:17	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	1.81	mg/L	0.080	0.008		W216078	AS	04/30/12 17:04	
EPA 200.7	Barium	0.0207	mg/L	0.0020	0.0002		W216078	AS	04/30/12 17:04	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.004		W216078	AS	04/30/12 17:04	
EPA 200.7	Calcium	4.38	mg/L	0.040	0.006		W216078	AS	04/30/12 17:04	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0004		W216078	AS	04/30/12 17:04	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0006		W216078	AS	04/30/12 17:04	
EPA 200.7	Iron	3.39	mg/L	0.060	0.011		W216078	AS	04/30/12 17:04	
EPA 200.7	Magnesium	8.05	mg/L	0.060	0.013		W216078	AS	04/30/12 17:04	
EPA 200.7	Manganese	0.184	mg/L	0.0040	0.0006		W216078	AS	04/30/12 17:04	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W216078	AS	04/30/12 17:04	
EPA 200.7	Nickel	0.012	mg/L	0.010	0.002		W216078	AS	04/30/12 17:04	
EPA 200.7	Potassium	1.22	mg/L	0.50	0.03		W216078	AS	04/30/12 17:04	
EPA 200.7	Silicon	25.3	mg/L	0.08	0.01		W216078	AS	04/30/12 17:04	
EPA 200.7	Sodium	21.6	mg/L	0.50	0.07		W216078	AS	04/30/12 17:04	
EPA 200.7	Titanium	0.0065	mg/L	0.0050	0.0001		W216078	AS	04/30/12 17:04	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0003		W216078	AS	04/30/12 17:04	
EPA 200.7	Zinc	0.0390	mg/L	0.0100	0.0010		W218096	DT	05/02/12 11:12	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W216084	KWH	04/30/12 09:24	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W216084	KWH	04/30/12 09:24	
EPA 200.8	Beryllium	< 0.000400	mg/L	0.000400	0.000192	5	W216084	KWH	04/30/12 10:05	D5
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.00002	2.5	W216084	KWH	04/30/12 09:24	
EPA 200.8	Copper	0.00343	mg/L	0.00100	0.00009	2.5	W216084	KWH	04/30/12 09:24	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000016	2.5	W216084	KWH	04/30/12 09:24	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W216084	KWH	04/30/12 09:24	
EPA 200.8	Silver	0.00123	mg/L	0.000100	0.000009	2.5	W216084	KWH	04/30/12 09:24	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000004	2.5	W216084	KWH	04/30/12 09:24	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000006	2.5	W216084	KWH	04/30/12 09:24	
SM 2340B	Hardness (as CaCO3)	39.5	mg/L	0.347	0.140		N/A		04/30/12 19:15	



Golder Associates (WA)
 18300 NE Union Hill Road, Suite 200
 Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W2D0302**

Reported: 03-May-12 15:49

Client Sample ID: **28MAR12GW006**

Sampled: 28-Mar-12 16:10

SVL Sample ID: **W2D0302-06 (Ground Water)**

Received: 16-Apr-12

Sample Report Page 2 of 3

Sampled By: JW

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.017		W216079	AS	04/30/12 19:15	
EPA 200.7	Barium	0.0144	mg/L	0.0020	0.0004		W216079	AS	04/30/12 20:19	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.008		W216079	AS	04/30/12 19:15	
EPA 200.7	Calcium	4.22	mg/L	0.040	0.013		W216079	AS	04/30/12 19:15	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0007		W216079	AS	04/30/12 19:15	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0012		W216079	AS	04/30/12 19:15	
EPA 200.7	Iron	0.863	mg/L	0.060	0.022		W216079	AS	04/30/12 19:15	
EPA 200.7	Magnesium	7.03	mg/L	0.060	0.026		W216079	AS	04/30/12 19:15	
EPA 200.7	Manganese	0.150	mg/L	0.0040	0.0011		W216079	AS	04/30/12 19:15	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.002		W216079	AS	04/30/12 19:15	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.004		W216079	AS	04/30/12 19:15	
EPA 200.7	Potassium	1.24	mg/L	0.50	0.07		W216079	AS	04/30/12 19:15	
EPA 200.7	Silicon	22.4	mg/L	0.08	0.03		W216079	AS	04/30/12 19:15	
EPA 200.7	Sodium	21.1	mg/L	0.50	0.14		W216079	AS	04/30/12 19:15	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W216079	AS	04/30/12 19:15	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W216079	AS	04/30/12 19:15	
EPA 200.7	Zinc	0.0112	mg/L	0.0100	0.0019		W216079	AS	04/30/12 19:15	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W216085	KWH	04/30/12 08:17	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W216085	KWH	04/30/12 08:17	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000077		W216085	KWH	04/30/12 08:17	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.000013		W216085	KWH	04/30/12 08:17	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.000072		W216085	KWH	04/30/12 08:17	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000013		W216085	KWH	04/30/12 08:17	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W216085	KWH	04/30/12 08:17	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.0000074		W216085	KWH	04/30/12 08:17	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000033		W216085	KWH	04/30/12 08:17	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000049		W216085	KWH	04/30/12 08:17	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000054		W216273	DJA	04/23/12 14:15	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0005		W216257	IIT	04/19/12 16:45	H3
EPA 120.1	Specific conductance	202	µmhos/cm	5.00			W216086	RS	04/17/12 08:50	
EPA 180.1	Turbidity	86.5	NTU	5.00		5	W216076	SM	04/17/12 10:30	D2,H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W216112	IIT	04/18/12 16:18	H3
EPA 350.1	Ammonia as N	0.114	mg/L	0.030	0.006		W216209	RHW	04/24/12 13:42	
EPA 353.2	Nitrate/Nitrite as N	< 0.050	mg/L	0.050	0.008		W217025	RHW	04/23/12 09:48	
SM 2320B/2310B	Bicarbonate	69.8	mg/L	1.0	0.1		W216176	DKS	04/19/12 11:51	H3
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.1		W216176	DKS	04/19/12 11:51	H3
SM 2320B/2310B	Total Alkalinity	69.8	mg/L	1.0	0.1		W216176	DKS	04/19/12 11:51	H3
SM 2540 C	Total Diss. Solids	155	mg/L	10			W216077	rs	04/17/12 11:35	H3
SM 2540 D	Total Susp. Solids	255	mg/L	5.0			W216088	RS	04/17/12 11:35	H3
SM 4500 H B	pH @24.0°C	6.84	pH Units				W216176	DKS	04/19/12 11:51	H3,H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W216113	IIT	04/18/12 18:50	H3
SM 4500-P-E	Phosphorus	0.231	mg/L	0.010	0.005		W216289	NCS	04/20/12 16:34	



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Kellogg ID 83837-0929

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Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W2D0302**

Reported: 03-May-12 15:49

Client Sample ID: **28MAR12GW006**

SVL Sample ID: **W2D0302-06 (Ground Water)**

Sample Report Page 3 of 3

Sampled: 28-Mar-12 16:10

Received: 16-Apr-12

Sampled By: JW

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	7.38	mg/L	0.20	0.07		W217062	AEW	04/23/12 18:04	
EPA 300.0	Fluoride	0.17	mg/L	0.10	0.02		W217062	AEW	04/23/12 18:04	
EPA 300.0	Sulfate as SO4	9.41	mg/L	0.30	0.04		W217062	AEW	04/23/12 18:04	

Cation/Anion Balance and TDS Ratios

Cation Sum: 1.79 meq/L Anion Sum: 1.81 meq/L C/A Balance: -0.65 % Calculated TDS: 158 TDS/cTDS: 0.98 TDS/eC: 0.77

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: W2D0302

Reported: 03-May-12 15:49

Client Sample ID: 29MAR12GW007

SVL Sample ID: W2D0302-07 (Ground Water)

Sample Report Page 1 of 3

Sampled: 29-Mar-12 11:30

Received: 16-Apr-12

Sampled By: JW

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000054		W216276	DJA	04/23/12 16:22	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.008		W216078	AS	04/30/12 17:20	
EPA 200.7	Barium	0.156	mg/L	0.0020	0.0002		W216078	AS	04/30/12 17:20	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.004		W216078	AS	04/30/12 17:20	
EPA 200.7	Calcium	41.6	mg/L	0.040	0.006		W216078	AS	04/30/12 17:20	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0004		W216078	AS	04/30/12 17:20	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0006		W216078	AS	04/30/12 17:20	
EPA 200.7	Iron	0.795	mg/L	0.060	0.011		W216078	AS	04/30/12 17:20	
EPA 200.7	Magnesium	18.2	mg/L	0.060	0.013		W216078	AS	04/30/12 17:20	
EPA 200.7	Manganese	1.07	mg/L	0.0040	0.0006		W216078	AS	04/30/12 17:20	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W216078	AS	04/30/12 17:20	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W216078	AS	04/30/12 17:20	
EPA 200.7	Potassium	0.83	mg/L	0.50	0.03		W216078	AS	04/30/12 17:20	
EPA 200.7	Silicon	21.9	mg/L	0.08	0.01		W216078	AS	04/30/12 17:20	
EPA 200.7	Sodium	22.6	mg/L	0.50	0.07		W216078	AS	04/30/12 17:20	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0001		W216078	AS	04/30/12 17:20	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0003		W216078	AS	04/30/12 17:20	
EPA 200.7	Zinc	0.0139	mg/L	0.0100	0.0010		W218096	DT	05/02/12 11:29	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W216084	KWH	04/30/12 09:29	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W216084	KWH	04/30/12 09:29	
EPA 200.8	Beryllium	< 0.000400	mg/L	0.000400	0.000192	5	W216084	KWH	04/30/12 10:07	D5
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.00002	2.5	W216084	KWH	04/30/12 09:29	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.00009	2.5	W216084	KWH	04/30/12 09:29	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000016	2.5	W216084	KWH	04/30/12 09:29	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W216084	KWH	04/30/12 09:29	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.000009	2.5	W216084	KWH	04/30/12 09:29	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000004	2.5	W216084	KWH	04/30/12 09:29	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000006	2.5	W216084	KWH	04/30/12 09:29	
SM 2340B	Hardness (as CaCO3)	177	mg/L	0.347	0.140		N/A		04/30/12 19:21	



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W2D0302**

Reported: 03-May-12 15:49

Client Sample ID: **29MAR12GW007**

SVL Sample ID: **W2D0302-07 (Ground Water)**

Sample Report Page 2 of 3

Sampled: 29-Mar-12 11:30

Received: 16-Apr-12

Sampled By: JW

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.017		W216079	AS	04/30/12 19:21	
EPA 200.7	Barium	0.164	mg/L	0.0020	0.0004		W216079	AS	04/30/12 20:23	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.008		W216079	AS	04/30/12 19:21	
EPA 200.7	Calcium	40.7	mg/L	0.040	0.013		W216079	AS	04/30/12 19:21	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0007		W216079	AS	04/30/12 19:21	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0012		W216079	AS	04/30/12 19:21	
EPA 200.7	Iron	0.703	mg/L	0.060	0.022		W216079	AS	04/30/12 19:21	
EPA 200.7	Magnesium	18.3	mg/L	0.060	0.026		W216079	AS	04/30/12 19:21	
EPA 200.7	Manganese	1.06	mg/L	0.0040	0.0011		W216079	AS	04/30/12 19:21	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.002		W216079	AS	04/30/12 19:21	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.004		W216079	AS	04/30/12 19:21	
EPA 200.7	Potassium	0.89	mg/L	0.50	0.07		W216079	AS	04/30/12 19:21	
EPA 200.7	Silicon	21.2	mg/L	0.08	0.03		W216079	AS	04/30/12 19:21	
EPA 200.7	Sodium	21.7	mg/L	0.50	0.14		W216079	AS	04/30/12 19:21	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W216079	AS	04/30/12 19:21	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W216079	AS	04/30/12 19:21	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0019		W216079	AS	04/30/12 19:21	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W216085	KWH	04/30/12 08:23	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W216085	KWH	04/30/12 08:23	
EPA 200.8	Beryllium	< 0.00128	mg/L	0.00128	0.000616	8	W216085	KWH	04/30/12 08:58	D5
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.000013		W216085	KWH	04/30/12 08:23	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.000072		W216085	KWH	04/30/12 08:23	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000013		W216085	KWH	04/30/12 08:23	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W216085	KWH	04/30/12 08:23	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.0000074		W216085	KWH	04/30/12 08:23	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000033		W216085	KWH	04/30/12 08:23	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000049		W216085	KWH	04/30/12 08:23	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000054		W216273	DJA	04/23/12 14:16	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0005		W216257	IIT	04/19/12 16:47	H3
EPA 120.1	Specific conductance	482	µmhos/cm	5.00			W216086	RS	04/17/12 08:50	
EPA 180.1	Turbidity	3.43	NTU	0.100			W216076	SM	04/17/12 10:30	H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W216112	IIT	04/18/12 16:20	H3
EPA 350.1	Ammonia as N	< 0.030	mg/L	0.030	0.006		W216209	RHW	04/24/12 13:13	
EPA 353.2	Nitrate/Nitrite as N	< 0.050	mg/L	0.050	0.008		W217025	RHW	04/23/12 09:50	
SM 2320B/2310B	Bicarbonate	226	mg/L	1.0	0.1		W216176	DKS	04/19/12 11:57	H3
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.1		W216176	DKS	04/19/12 11:57	H3
SM 2320B/2310B	Total Alkalinity	226	mg/L	1.0	0.1		W216176	DKS	04/19/12 11:57	H3
SM 2540 C	Total Diss. Solids	260	mg/L	10			W216077	rs	04/17/12 11:35	H3
SM 2540 D	Total Susp. Solids	6.0	mg/L	5.0			W216088	RS	04/17/12 11:35	H3
SM 4500 H B	pH @24.0°C	7.62	pH Units				W216176	DKS	04/19/12 11:57	H3,H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W216261	IIT	04/19/12 19:17	H3,N3
SM 4500-P-E	Phosphorus	0.038	mg/L	0.010	0.005		W216289	NCS	04/20/12 16:34	



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Golder Associates (WA)
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Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W2D0302**

Reported: 03-May-12 15:49

Client Sample ID: **29MAR12GW007**

SVL Sample ID: **W2D0302-07 (Ground Water)**

Sample Report Page 3 of 3

Sampled: 29-Mar-12 11:30

Received: 16-Apr-12

Sampled By: JW

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	5.05	mg/L	0.20	0.07		W217062	AEW	04/23/12 18:25	
EPA 300.0	Fluoride	0.10	mg/L	0.10	0.02		W217062	AEW	04/23/12 18:25	
EPA 300.0	Sulfate as SO4	1.17	mg/L	0.30	0.04		W217062	AEW	04/23/12 18:25	

Cation/Anion Balance and TDS Ratios

Cation Sum: 4.56 meq/L Anion Sum: 4.69 meq/L C/A Balance: -1.37 % Calculated TDS: 283 TDS/cTDS: 0.92 TDS/eC: 0.54

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Golder Associates (WA)
 18300 NE Union Hill Road, Suite 200
 Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W2D0302**

Reported: 03-May-12 15:49

Client Sample ID: **29MAR12GW107**

SVL Sample ID: **W2D0302-08 (Ground Water)**

Sample Report Page 1 of 3

Sampled: 29-Mar-12 11:30

Received: 16-Apr-12

Sampled By: JW

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total)										
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000054		W216276	DJA	04/23/12 16:23	
Metals (Total Recoverable--reportable as Total per 40 CFR 136)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.008		W216078	AS	04/30/12 17:25	
EPA 200.7	Barium	0.153	mg/L	0.0020	0.0002		W216078	AS	04/30/12 17:25	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.004		W216078	AS	04/30/12 17:25	
EPA 200.7	Calcium	40.9	mg/L	0.040	0.006		W216078	AS	04/30/12 17:25	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0004		W216078	AS	04/30/12 17:25	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0006		W216078	AS	04/30/12 17:25	
EPA 200.7	Iron	0.757	mg/L	0.060	0.011		W216078	AS	04/30/12 17:25	
EPA 200.7	Magnesium	17.9	mg/L	0.060	0.013		W216078	AS	04/30/12 17:25	
EPA 200.7	Manganese	1.05	mg/L	0.0040	0.0006		W216078	AS	04/30/12 17:25	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W216078	AS	04/30/12 17:25	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W216078	AS	04/30/12 17:25	
EPA 200.7	Potassium	0.83	mg/L	0.50	0.03		W216078	AS	04/30/12 17:25	
EPA 200.7	Silicon	21.5	mg/L	0.08	0.01		W216078	AS	04/30/12 17:25	
EPA 200.7	Sodium	22.1	mg/L	0.50	0.07		W216078	AS	04/30/12 17:25	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0001		W216078	AS	04/30/12 17:25	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0003		W216078	AS	04/30/12 17:25	
EPA 200.7	Zinc	0.0100	mg/L	0.0100	0.0010		W218096	DT	05/02/12 11:34	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W216084	KWH	04/30/12 09:31	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W216084	KWH	04/30/12 09:31	
EPA 200.8	Beryllium	< 0.000400	mg/L	0.000400	0.000192	5	W216084	KWH	04/30/12 10:09	D5
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.00002	2.5	W216084	KWH	04/30/12 09:31	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.00009	2.5	W216084	KWH	04/30/12 09:31	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000016	2.5	W216084	KWH	04/30/12 09:31	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W216084	KWH	04/30/12 09:31	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.000009	2.5	W216084	KWH	04/30/12 09:31	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000004	2.5	W216084	KWH	04/30/12 09:31	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000006	2.5	W216084	KWH	04/30/12 09:31	
SM 2340B	Hardness (as CaCO3)	179	mg/L	0.347	0.140		N/A		04/30/12 19:26	



Golder Associates (WA)
 18300 NE Union Hill Road, Suite 200
 Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W2D0302**

Reported: 03-May-12 15:49

Client Sample ID: **29MAR12GW107**

Sampled: 29-Mar-12 11:30

SVL Sample ID: **W2D0302-08 (Ground Water)**

Received: 16-Apr-12

Sample Report Page 2 of 3

Sampled By: JW

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.017		W216079	AS	04/30/12 19:26	
EPA 200.7	Barium	0.165	mg/L	0.0020	0.0004		W216079	AS	04/30/12 20:27	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.008		W216079	AS	04/30/12 19:26	
EPA 200.7	Calcium	40.9	mg/L	0.040	0.013		W216079	AS	04/30/12 19:26	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0007		W216079	AS	04/30/12 19:26	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0012		W216079	AS	04/30/12 19:26	
EPA 200.7	Iron	0.713	mg/L	0.060	0.022		W216079	AS	04/30/12 19:26	
EPA 200.7	Magnesium	18.6	mg/L	0.060	0.026		W216079	AS	04/30/12 19:26	
EPA 200.7	Manganese	1.08	mg/L	0.0040	0.0011		W216079	AS	04/30/12 19:26	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.002		W216079	AS	04/30/12 19:26	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.004		W216079	AS	04/30/12 19:26	
EPA 200.7	Potassium	0.90	mg/L	0.50	0.07		W216079	AS	04/30/12 19:26	
EPA 200.7	Silicon	21.5	mg/L	0.08	0.03		W216079	AS	04/30/12 19:26	
EPA 200.7	Sodium	21.7	mg/L	0.50	0.14		W216079	AS	04/30/12 19:26	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W216079	AS	04/30/12 19:26	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W216079	AS	04/30/12 19:26	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0019		W216079	AS	04/30/12 19:26	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W216085	KWH	04/30/12 08:24	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W216085	KWH	04/30/12 08:24	
EPA 200.8	Beryllium	< 0.00256	mg/L	0.00256	0.00123	16	W216085	KWH	04/30/12 09:02	D5
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.000013		W216085	KWH	04/30/12 08:24	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.000072		W216085	KWH	04/30/12 08:24	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000013		W216085	KWH	04/30/12 08:24	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W216085	KWH	04/30/12 08:24	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.0000074		W216085	KWH	04/30/12 08:24	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000033		W216085	KWH	04/30/12 08:24	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000049		W216085	KWH	04/30/12 08:24	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000054		W216273	DJA	04/23/12 14:18	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0005		W216257	IIT	04/19/12 16:49	H3
EPA 120.1	Specific conductance	483	µmhos/cm	5.00			W216086	RS	04/17/12 08:50	
EPA 180.1	Turbidity	3.11	NTU	0.100			W216076	SM	04/17/12 10:30	H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W216112	IIT	04/18/12 16:22	H3
EPA 350.1	Ammonia as N	< 0.030	mg/L	0.030	0.006		W216209	RHW	04/24/12 13:14	
EPA 353.2	Nitrate/Nitrite as N	< 0.050	mg/L	0.050	0.008		W217025	RHW	04/23/12 09:51	
SM 2320B/2310B	Bicarbonate	223	mg/L	1.0	0.1		W216176	DKS	04/19/12 12:03	H3
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.1		W216176	DKS	04/19/12 12:03	H3
SM 2320B/2310B	Total Alkalinity	223	mg/L	1.0	0.1		W216176	DKS	04/19/12 12:03	H3
SM 2540 C	Total Diss. Solids	268	mg/L	10			W216077	rs	04/17/12 11:35	H3
SM 2540 D	Total Susp. Solids	6.0	mg/L	5.0			W216088	RS	04/17/12 11:35	H3
SM 4500 H B	pH @24.0°C	7.57	pH Units				W216176	DKS	04/19/12 12:03	H3,H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W216261	IIT	04/19/12 19:19	H3,N3
SM 4500-P-E	Phosphorus	0.038	mg/L	0.010	0.005		W216289	NCS	04/20/12 16:34	



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

(208) 784-1258

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Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W2D0302**

Reported: 03-May-12 15:49

Client Sample ID: **29MAR12GW107**

SVL Sample ID: **W2D0302-08 (Ground Water)**

Sample Report Page 3 of 3

Sampled: 29-Mar-12 11:30

Received: 16-Apr-12

Sampled By: JW

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	5.05	mg/L	0.20	0.07		W217062	AEW	04/23/12 18:46	
EPA 300.0	Fluoride	< 0.10	mg/L	0.10	0.02		W217062	AEW	04/23/12 18:46	
EPA 300.0	Sulfate as SO4	1.19	mg/L	0.30	0.04		W217062	AEW	04/23/12 18:46	

Cation/Anion Balance and TDS Ratios

Cation Sum: 4.55 meq/L Anion Sum: 4.62 meq/L C/A Balance: -0.85 % Calculated TDS: 280 TDS/cTDS: 0.96 TDS/eC: 0.55

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: W2D0302

Reported: 03-May-12 15:49

Client Sample ID: 29MAR12GW008

SVL Sample ID: W2D0302-09 (Ground Water)

Sample Report Page 1 of 3

Sampled: 29-Mar-12 17:00

Received: 16-Apr-12

Sampled By: JW

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total)										
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000054		W216276	DJA	04/23/12 16:25	
Metals (Total Recoverable--reportable as Total per 40 CFR 136)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.008		W216078	AS	04/30/12 17:30	
EPA 200.7	Barium	0.0346	mg/L	0.0020	0.0002		W216078	AS	04/30/12 17:30	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.004		W216078	AS	04/30/12 17:30	
EPA 200.7	Calcium	35.6	mg/L	0.040	0.006		W216078	AS	04/30/12 17:30	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0004		W216078	AS	04/30/12 17:30	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0006		W216078	AS	04/30/12 17:30	
EPA 200.7	Iron	0.557	mg/L	0.060	0.011		W216078	AS	04/30/12 17:30	
EPA 200.7	Magnesium	14.2	mg/L	0.060	0.013		W216078	AS	04/30/12 17:30	
EPA 200.7	Manganese	0.764	mg/L	0.0040	0.0006		W216078	AS	04/30/12 17:30	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W216078	AS	04/30/12 17:30	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W216078	AS	04/30/12 17:30	
EPA 200.7	Potassium	2.39	mg/L	0.50	0.03		W216078	AS	04/30/12 17:30	
EPA 200.7	Silicon	18.5	mg/L	0.08	0.01		W216078	AS	04/30/12 17:30	
EPA 200.7	Sodium	36.6	mg/L	0.50	0.07		W216078	AS	04/30/12 17:30	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0001		W216078	AS	04/30/12 17:30	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0003		W216078	AS	04/30/12 17:30	
EPA 200.7	Zinc	0.0407	mg/L	0.0100	0.0010		W218096	DT	05/02/12 11:40	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W216084	KWH	04/30/12 09:33	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W216084	KWH	04/30/12 09:33	
EPA 200.8	Beryllium	< 0.000400	mg/L	0.000400	0.000192	5	W216084	KWH	04/30/12 10:14	D5
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.00002	2.5	W216084	KWH	04/30/12 09:33	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.00009	2.5	W216084	KWH	04/30/12 09:33	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000016	2.5	W216084	KWH	04/30/12 09:33	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W216084	KWH	04/30/12 09:33	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.000009	2.5	W216084	KWH	04/30/12 09:33	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000004	2.5	W216084	KWH	04/30/12 09:33	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000006	2.5	W216084	KWH	04/30/12 09:33	
SM 2340B	Hardness (as CaCO3)	148	mg/L	0.347	0.140		N/A		04/30/12 19:31	



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W2D0302**

Reported: 03-May-12 15:49

Client Sample ID: **29MAR12GW008**

Sampled: 29-Mar-12 17:00

SVL Sample ID: **W2D0302-09 (Ground Water)**

Received: 16-Apr-12

Sample Report Page 2 of 3

Sampled By: JW

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.017		W216079	AS	04/30/12 19:31	
EPA 200.7	Barium	0.0380	mg/L	0.0020	0.0004		W216079	AS	04/30/12 20:31	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.008		W216079	AS	04/30/12 19:31	
EPA 200.7	Calcium	35.6	mg/L	0.040	0.013		W216079	AS	04/30/12 19:31	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0007		W216079	AS	04/30/12 19:31	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0012		W216079	AS	04/30/12 19:31	
EPA 200.7	Iron	0.514	mg/L	0.060	0.022		W216079	AS	04/30/12 19:31	
EPA 200.7	Magnesium	14.3	mg/L	0.060	0.026		W216079	AS	04/30/12 19:31	
EPA 200.7	Manganese	0.782	mg/L	0.0040	0.0011		W216079	AS	04/30/12 19:31	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.002		W216079	AS	04/30/12 19:31	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.004		W216079	AS	04/30/12 19:31	
EPA 200.7	Potassium	2.46	mg/L	0.50	0.07		W216079	AS	04/30/12 19:31	
EPA 200.7	Silicon	18.2	mg/L	0.08	0.03		W216079	AS	04/30/12 19:31	
EPA 200.7	Sodium	36.0	mg/L	0.50	0.14		W216079	AS	04/30/12 19:31	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W216079	AS	04/30/12 19:31	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W216079	AS	04/30/12 19:31	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0019		W216079	AS	04/30/12 19:31	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W216085	KWH	04/30/12 08:26	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W216085	KWH	04/30/12 08:26	
EPA 200.8	Beryllium	< 0.000320	mg/L	0.000320	0.000154	2	W216085	KWH	04/30/12 08:50	D5
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.000013		W216085	KWH	04/30/12 08:26	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.000072		W216085	KWH	04/30/12 08:26	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000013		W216085	KWH	04/30/12 08:26	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W216085	KWH	04/30/12 08:26	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.0000074		W216085	KWH	04/30/12 08:26	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000033		W216085	KWH	04/30/12 08:26	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000049		W216085	KWH	04/30/12 08:26	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000054		W216273	DJA	04/23/12 14:20	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0005		W216257	IIT	04/19/12 17:00	H3,N3
EPA 120.1	Specific conductance	497	µmhos/cm	5.00			W216086	RS	04/17/12 08:50	
EPA 180.1	Turbidity	1.83	NTU	0.100			W216076	SM	04/17/12 10:30	H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W216112	IIT	04/18/12 16:24	H3
EPA 350.1	Ammonia as N	0.299	mg/L	0.030	0.006		W216209	RHW	04/24/12 13:15	
EPA 353.2	Nitrate/Nitrite as N	< 0.050	mg/L	0.050	0.008		W217025	RHW	04/23/12 09:52	
SM 2320B/2310B	Bicarbonate	221	mg/L	1.0	0.1		W216176	DKS	04/19/12 12:10	H3
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.1		W216176	DKS	04/19/12 12:10	H3
SM 2320B/2310B	Total Alkalinity	221	mg/L	1.0	0.1		W216176	DKS	04/19/12 12:10	H3
SM 2540 C	Total Diss. Solids	282	mg/L	10			W216077	rs	04/17/12 11:35	H3
SM 2540 D	Total Susp. Solids	< 5.0	mg/L	5.0			W216088	RS	04/17/12 11:35	H3
SM 4500 H B	pH @24.0°C	7.71	pH Units				W216176	DKS	04/19/12 12:10	H3,H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W216113	IIT	04/18/12 18:56	H3
SM 4500-P-E	Phosphorus	0.028	mg/L	0.010	0.005		W216289	NCS	04/20/12 16:34	



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Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
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Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W2D0302**

Reported: 03-May-12 15:49

Client Sample ID: **29MAR12GW008**

SVL Sample ID: **W2D0302-09 (Ground Water)**

Sample Report Page 3 of 3

Sampled: 29-Mar-12 17:00

Received: 16-Apr-12

Sampled By: JW

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	8.97	mg/L	0.20	0.07		W217062	AEW	04/23/12 19:06	
EPA 300.0	Fluoride	0.17	mg/L	0.10	0.02		W217062	AEW	04/23/12 19:06	
EPA 300.0	Sulfate as SO4	5.53	mg/L	0.30	0.04		W217062	AEW	04/23/12 19:06	

Cation/Anion Balance and TDS Ratios

Cation Sum: 4.64 meq/L Anion Sum: 4.79 meq/L C/A Balance: -1.61 % Calculated TDS: 286 TDS/cTDS: 0.99 TDS/eC: 0.57

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: W2D0302

Reported: 03-May-12 15:49

Client Sample ID: 30MAR12GW009

SVL Sample ID: W2D0302-10 (Ground Water)

Sample Report Page 1 of 3

Sampled: 30-Mar-12 11:00

Received: 16-Apr-12

Sampled By: JW

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total)										
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000054		W216276	DJA	04/23/12 16:27	
Metals (Total Recoverable--reportable as Total per 40 CFR 136)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.008		W216078	AS	04/30/12 17:36	
EPA 200.7	Barium	0.0281	mg/L	0.0020	0.0002		W216078	AS	04/30/12 17:36	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.004		W216078	AS	04/30/12 17:36	
EPA 200.7	Calcium	32.7	mg/L	0.040	0.006		W216078	AS	04/30/12 17:36	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0004		W216078	AS	04/30/12 17:36	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0006		W216078	AS	04/30/12 17:36	
EPA 200.7	Iron	1.07	mg/L	0.060	0.011		W216078	AS	04/30/12 17:36	
EPA 200.7	Magnesium	17.4	mg/L	0.060	0.013		W216078	AS	04/30/12 17:36	
EPA 200.7	Manganese	0.703	mg/L	0.0040	0.0006		W216078	AS	04/30/12 17:36	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W216078	AS	04/30/12 17:36	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W216078	AS	04/30/12 17:36	
EPA 200.7	Potassium	0.87	mg/L	0.50	0.03		W216078	AS	04/30/12 17:36	
EPA 200.7	Silicon	29.7	mg/L	0.08	0.01		W216078	AS	04/30/12 17:36	
EPA 200.7	Sodium	21.3	mg/L	0.50	0.07		W216078	AS	04/30/12 17:36	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0001		W216078	AS	04/30/12 17:36	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0003		W216078	AS	04/30/12 17:36	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0010		W218096	DT	05/02/12 11:46	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W216084	KWH	04/30/12 09:35	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W216084	KWH	04/30/12 09:35	
EPA 200.8	Beryllium	< 0.000400	mg/L	0.000400	0.000192	5	W216084	KWH	04/30/12 10:16	D5
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.00002	2.5	W216084	KWH	04/30/12 09:35	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.00009	2.5	W216084	KWH	04/30/12 09:35	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000016	2.5	W216084	KWH	04/30/12 09:35	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W216084	KWH	04/30/12 09:35	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.000009	2.5	W216084	KWH	04/30/12 09:35	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000004	2.5	W216084	KWH	04/30/12 09:35	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000006	2.5	W216084	KWH	04/30/12 09:35	
SM 2340B	Hardness (as CaCO3)	157	mg/L	0.347	0.140		N/A		04/30/12 19:37	



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W2D0302**

Reported: 03-May-12 15:49

Client Sample ID: **30MAR12GW009**

SVL Sample ID: **W2D0302-10 (Ground Water)**

Sample Report Page 2 of 3

Sampled: 30-Mar-12 11:00

Received: 16-Apr-12

Sampled By: JW

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.017		W216079	AS	04/30/12 19:37	
EPA 200.7	Barium	0.0292	mg/L	0.0020	0.0004		W216079	AS	04/30/12 20:36	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.008		W216079	AS	04/30/12 19:37	
EPA 200.7	Calcium	33.0	mg/L	0.040	0.013		W216079	AS	04/30/12 19:37	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0007		W216079	AS	04/30/12 19:37	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0012		W216079	AS	04/30/12 19:37	
EPA 200.7	Iron	0.941	mg/L	0.060	0.022		W216079	AS	04/30/12 19:37	
EPA 200.7	Magnesium	18.1	mg/L	0.060	0.026		W216079	AS	04/30/12 19:37	
EPA 200.7	Manganese	0.713	mg/L	0.0040	0.0011		W216079	AS	04/30/12 19:37	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.002		W216079	AS	04/30/12 19:37	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.004		W216079	AS	04/30/12 19:37	
EPA 200.7	Potassium	0.95	mg/L	0.50	0.07		W216079	AS	04/30/12 19:37	
EPA 200.7	Silicon	29.5	mg/L	0.08	0.03		W216079	AS	04/30/12 19:37	
EPA 200.7	Sodium	20.8	mg/L	0.50	0.14		W216079	AS	04/30/12 19:37	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W216079	AS	04/30/12 19:37	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W216079	AS	04/30/12 19:37	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0019		W216079	AS	04/30/12 19:37	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W216085	KWH	04/30/12 08:31	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W216085	KWH	04/30/12 08:31	
EPA 200.8	Beryllium	< 0.000320	mg/L	0.000320	0.000154	2	W216085	KWH	04/30/12 08:52	D5
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.000013		W216085	KWH	04/30/12 08:31	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.000072		W216085	KWH	04/30/12 08:31	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000013		W216085	KWH	04/30/12 08:31	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W216085	KWH	04/30/12 08:31	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.0000074		W216085	KWH	04/30/12 08:31	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000033		W216085	KWH	04/30/12 08:31	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000049		W216085	KWH	04/30/12 08:31	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000054		W216273	DJA	04/23/12 14:21	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0005		W216257	IIT	04/19/12 16:53	H3
EPA 120.1	Specific conductance	431	µmhos/cm	5.00			W216086	RS	04/17/12 08:50	
EPA 180.1	Turbidity	4.78	NTU	0.100			W216076	SM	04/17/12 10:30	H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W216112	IIT	04/18/12 16:26	H3
EPA 350.1	Ammonia as N	0.102	mg/L	0.030	0.006		W216209	RHW	04/24/12 13:17	
EPA 353.2	Nitrate/Nitrite as N	< 0.050	mg/L	0.050	0.008		W217025	RHW	04/23/12 09:54	
SM 2320B/2310B	Bicarbonate	198	mg/L	1.0	0.1		W216176	DKS	04/19/12 12:17	H3
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.1		W216176	DKS	04/19/12 12:17	H3
SM 2320B/2310B	Total Alkalinity	198	mg/L	1.0	0.1		W216176	DKS	04/19/12 12:17	H3
SM 2540 C	Total Diss. Solids	258	mg/L	10			W216077	rs	04/17/12 11:35	H3
SM 2540 D	Total Susp. Solids	< 5.0	mg/L	5.0			W216088	RS	04/17/12 11:35	H3
SM 4500 H B	pH @23.0°C	7.62	pH Units				W216176	DKS	04/19/12 12:17	H3,H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W216261	IIT	04/19/12 19:21	H3,N3
SM 4500-P-E	Phosphorus	0.142	mg/L	0.010	0.005		W216289	NCS	04/20/12 16:34	



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

(208) 784-1258

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Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W2D0302**

Reported: 03-May-12 15:49

Client Sample ID: **30MAR12GW009**

SVL Sample ID: **W2D0302-10 (Ground Water)**

Sample Report Page 3 of 3

Sampled: 30-Mar-12 11:00

Received: 16-Apr-12

Sampled By: JW

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	5.90	mg/L	0.20	0.07		W217062	AEW	04/23/12 19:27	
EPA 300.0	Fluoride	0.13	mg/L	0.10	0.02		W217062	AEW	04/23/12 19:27	
EPA 300.0	Sulfate as SO4	0.73	mg/L	0.30	0.04		W217062	AEW	04/23/12 19:27	

Cation/Anion Balance and TDS Ratios

Cation Sum: 4.06 meq/L Anion Sum: 4.15 meq/L C/A Balance: -1.05 % Calculated TDS: 278 TDS/cTDS: 0.93 TDS/eC: 0.60

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Golder Associates (WA)
 18300 NE Union Hill Road, Suite 200
 Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W2D0302**

Reported: 03-May-12 15:49

Client Sample ID: **NADD1298GW001**

SVL Sample ID: **W2D0302-11 (Ground Water)**

Sample Report Page 1 of 3

Sampled: 28-Mar-12 15:45

Received: 16-Apr-12

Sampled By: JW

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total)										
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000054		W216276	DJA	04/23/12 16:28	
Metals (Total Recoverable--reportable as Total per 40 CFR 136)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.008		W216078	AS	04/30/12 17:41	
EPA 200.7	Barium	0.0278	mg/L	0.0020	0.0002		W216078	AS	04/30/12 17:41	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.004		W216078	AS	04/30/12 17:41	
EPA 200.7	Calcium	27.8	mg/L	0.040	0.006		W216078	AS	04/30/12 17:41	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0004		W216078	AS	04/30/12 17:41	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0006		W216078	AS	04/30/12 17:41	
EPA 200.7	Iron	0.356	mg/L	0.060	0.011		W216078	AS	04/30/12 17:41	
EPA 200.7	Magnesium	11.4	mg/L	0.060	0.013		W216078	AS	04/30/12 17:41	
EPA 200.7	Manganese	0.157	mg/L	0.0040	0.0006		W216078	AS	04/30/12 17:41	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W216078	AS	04/30/12 17:41	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W216078	AS	04/30/12 17:41	
EPA 200.7	Potassium	0.95	mg/L	0.50	0.03		W216078	AS	04/30/12 17:41	
EPA 200.7	Silicon	20.3	mg/L	0.08	0.01		W216078	AS	04/30/12 17:41	
EPA 200.7	Sodium	43.3	mg/L	0.50	0.07		W216078	AS	04/30/12 17:41	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0001		W216078	AS	04/30/12 17:41	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0003		W216078	AS	04/30/12 17:41	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0010		W218096	DT	05/02/12 11:51	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W216084	KWH	04/30/12 09:37	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W216084	KWH	04/30/12 09:37	
EPA 200.8	Beryllium	< 0.000400	mg/L	0.000400	0.000192	5	W216084	KWH	04/30/12 10:18	D5
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.00002	2.5	W216084	KWH	04/30/12 09:37	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.00009	2.5	W216084	KWH	04/30/12 09:37	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000016	2.5	W216084	KWH	04/30/12 09:37	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W216084	KWH	04/30/12 09:37	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.000009	2.5	W216084	KWH	04/30/12 09:37	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000004	2.5	W216084	KWH	04/30/12 09:37	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000006	2.5	W216084	KWH	04/30/12 09:37	
SM 2340B	Hardness (as CaCO3)	118	mg/L	0.347	0.140		N/A		04/30/12 19:42	



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: **Suriname - Merian Gold 2011 / 113-93245**

Work Order: **W2D0302**

Reported: 03-May-12 15:49

Client Sample ID: **NADD1298GW001**

Sampled: 28-Mar-12 15:45

SVL Sample ID: **W2D0302-11 (Ground Water)**

Sample Report Page 2 of 3

Received: 16-Apr-12

Sampled By: JW

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Dissolved)

EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.017		W216079	AS	04/30/12 19:42	
EPA 200.7	Barium	0.0275	mg/L	0.0020	0.0004		W216079	AS	04/30/12 19:49	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.008		W216079	AS	04/30/12 19:42	
EPA 200.7	Calcium	28.0	mg/L	0.040	0.013		W216079	AS	04/30/12 19:42	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0007		W216079	AS	04/30/12 19:42	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0012		W216079	AS	04/30/12 19:42	
EPA 200.7	Iron	0.313	mg/L	0.060	0.022		W216079	AS	04/30/12 19:42	
EPA 200.7	Magnesium	11.7	mg/L	0.060	0.026		W216079	AS	04/30/12 19:42	
EPA 200.7	Manganese	0.161	mg/L	0.0040	0.0011		W216079	AS	04/30/12 19:42	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.002		W216079	AS	04/30/12 19:42	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.004		W216079	AS	04/30/12 19:42	
EPA 200.7	Potassium	1.06	mg/L	0.50	0.07		W216079	AS	04/30/12 19:42	
EPA 200.7	Silicon	19.9	mg/L	0.08	0.03		W216079	AS	04/30/12 19:42	
EPA 200.7	Sodium	42.1	mg/L	0.50	0.14		W216079	AS	04/30/12 19:42	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0003		W216079	AS	04/30/12 19:42	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0005		W216079	AS	04/30/12 19:42	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0019		W216079	AS	04/30/12 19:42	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W216085	KWH	04/30/12 08:33	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W216085	KWH	04/30/12 08:33	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000077		W216085	KWH	04/30/12 08:33	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.000013		W216085	KWH	04/30/12 08:33	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.000072		W216085	KWH	04/30/12 08:33	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000013		W216085	KWH	04/30/12 08:33	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W216085	KWH	04/30/12 08:33	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.0000074		W216085	KWH	04/30/12 08:33	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000033		W216085	KWH	04/30/12 08:33	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000049		W216085	KWH	04/30/12 08:33	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000054		W216273	DJA	04/23/12 14:23	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0005		W216257	IIT	04/19/12 17:02	H3,N3
EPA 120.1	Specific conductance	423	µmhos/cm	5.00			W216086	RS	04/17/12 08:50	
EPA 180.1	Turbidity	1.45	NTU	0.100			W216076	SM	04/17/12 10:30	H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W216112	IIT	04/18/12 16:28	H3
EPA 350.1	Ammonia as N	0.108	mg/L	0.030	0.006		W216209	RHW	04/24/12 13:18	
EPA 353.2	Nitrate/Nitrite as N	< 0.050	mg/L	0.050	0.008		W217025	RHW	04/23/12 09:55	
SM 2320B/2310B	Bicarbonate	202	mg/L	1.0	0.1		W216176	DKS	04/19/12 12:24	H3
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.1		W216176	DKS	04/19/12 12:24	H3
SM 2320B/2310B	Total Alkalinity	202	mg/L	1.0	0.1		W216176	DKS	04/19/12 12:24	H3
SM 2540 C	Total Diss. Solids	267	mg/L	10			W216077	rs	04/17/12 11:35	H3
SM 2540 D	Total Susp. Solids	6.0	mg/L	5.0			W216088	RS	04/17/12 11:35	H3
SM 4500 H B	pH @24.0°C	7.73	pH Units				W216176	DKS	04/19/12 12:24	H3,H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W216113	IIT	04/18/12 19:00	H3
SM 4500-P-E	Phosphorus	0.030	mg/L	0.010	0.005		W216289	NCS	04/20/12 16:34	
SM 5310B	Total Organic Carbon	1.17	mg/L	1.00	0.27		W216280	NCS	04/20/12 16:08	



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

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Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
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Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W2D0302**

Reported: 03-May-12 15:49

Client Sample ID: **NADD1298GW001**

SVL Sample ID: **W2D0302-11 (Ground Water)**

Sample Report Page 3 of 3

Sampled: 28-Mar-12 15:45

Received: 16-Apr-12

Sampled By: JW

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	4.68	mg/L	0.20	0.07		W217062	AEW	04/23/12 20:09	
EPA 300.0	Fluoride	0.15	mg/L	0.10	0.02		W217062	AEW	04/23/12 20:09	
EPA 300.0	Sulfate as SO4	8.24	mg/L	0.30	0.04		W217062	AEW	04/23/12 20:09	

Cation/Anion Balance and TDS Ratios

Cation Sum: 4.21 meq/L Anion Sum: 4.35 meq/L C/A Balance: -1.65 % Calculated TDS: 272 TDS/cTDS: 0.98 TDS/eC: 0.63

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245
Work Order: W2D0302
Reported: 03-May-12 15:49

Quality Control - BLANK Data

Method	Analyte	Units	Result	MDL	MRL	Batch ID	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	mg/L	<0.00020	0.000054	0.00020	W216275	23-Apr-12	
EPA 245.1	Mercury	mg/L	<0.00020	0.000054	0.00020	W216276	23-Apr-12	

Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	mg/L	<0.080	0.008	0.080	W216078	30-Apr-12	
EPA 200.7	Barium	mg/L	<0.0020	0.0002	0.0020	W216078	30-Apr-12	
EPA 200.7	Boron	mg/L	<0.040	0.004	0.040	W216078	30-Apr-12	
EPA 200.7	Calcium	mg/L	<0.040	0.006	0.040	W216078	30-Apr-12	
EPA 200.7	Chromium	mg/L	<0.0060	0.0004	0.0060	W216078	30-Apr-12	
EPA 200.7	Cobalt	mg/L	<0.0060	0.0006	0.0060	W216078	30-Apr-12	
EPA 200.7	Iron	mg/L	<0.060	0.011	0.060	W216078	30-Apr-12	
EPA 200.7	Magnesium	mg/L	<0.060	0.013	0.060	W216078	30-Apr-12	
EPA 200.7	Manganese	mg/L	<0.0040	0.0006	0.0040	W216078	30-Apr-12	
EPA 200.7	Molybdenum	mg/L	<0.008	0.001	0.008	W216078	30-Apr-12	
EPA 200.7	Nickel	mg/L	<0.010	0.002	0.010	W216078	30-Apr-12	
EPA 200.7	Potassium	mg/L	<0.50	0.03	0.50	W216078	30-Apr-12	
EPA 200.7	Silicon	mg/L	<0.08	0.01	0.08	W216078	30-Apr-12	
EPA 200.7	Sodium	mg/L	<0.50	0.07	0.50	W216078	30-Apr-12	
EPA 200.7	Titanium	mg/L	<0.0050	0.0001	0.0050	W216078	30-Apr-12	
EPA 200.7	Vanadium	mg/L	<0.0050	0.0003	0.0050	W216078	30-Apr-12	
EPA 200.7	Zinc	mg/L	<0.0100	0.0010	0.0100	W218096	02-May-12	
EPA 200.8	Antimony	mg/L	<0.00300	0.00015	0.00300	W216084	30-Apr-12	
EPA 200.8	Arsenic	mg/L	<0.0030	0.0003	0.0030	W216084	30-Apr-12	
EPA 200.8	Copper	mg/L	<0.00100	0.00009	0.00100	W216084	30-Apr-12	
EPA 200.8	Lead	mg/L	<0.00300	0.000016	0.00300	W216084	30-Apr-12	
EPA 200.8	Selenium	mg/L	<0.00300	0.00028	0.00300	W216084	30-Apr-12	
EPA 200.8	Silver	mg/L	<0.000100	0.000009	0.000100	W216084	30-Apr-12	
EPA 200.8	Uranium	mg/L	<0.00100	0.000006	0.00100	W216084	30-Apr-12	
EPA 200.8	Thallium	mg/L	<0.00100	0.000004	0.00100	W216084	30-Apr-12	
EPA 200.8	Cadmium	mg/L	<0.00020	0.00002	0.00020	W216084	30-Apr-12	

Metals (Dissolved)

EPA 200.7	Aluminum	mg/L	<0.080	0.017	0.080	W216079	30-Apr-12	
EPA 200.7	Barium	mg/L	<0.0020	0.0004	0.0020	W216079	30-Apr-12	
EPA 200.7	Boron	mg/L	<0.040	0.008	0.040	W216079	30-Apr-12	
EPA 200.7	Calcium	mg/L	<0.040	0.013	0.040	W216079	30-Apr-12	
EPA 200.7	Chromium	mg/L	<0.0060	0.0007	0.0060	W216079	30-Apr-12	
EPA 200.7	Cobalt	mg/L	<0.0060	0.0012	0.0060	W216079	30-Apr-12	
EPA 200.7	Iron	mg/L	<0.060	0.022	0.060	W216079	30-Apr-12	
EPA 200.7	Magnesium	mg/L	<0.060	0.026	0.060	W216079	30-Apr-12	
EPA 200.7	Manganese	mg/L	<0.0040	0.0011	0.0040	W216079	30-Apr-12	
EPA 200.7	Molybdenum	mg/L	<0.008	0.002	0.008	W216079	30-Apr-12	
EPA 200.7	Nickel	mg/L	<0.010	0.004	0.010	W216079	30-Apr-12	
EPA 200.7	Potassium	mg/L	<0.50	0.07	0.50	W216079	30-Apr-12	
EPA 200.7	Silicon	mg/L	<0.08	0.03	0.08	W216079	30-Apr-12	
EPA 200.7	Sodium	mg/L	<0.50	0.14	0.50	W216079	30-Apr-12	
EPA 200.7	Titanium	mg/L	<0.0050	0.0003	0.0050	W216079	30-Apr-12	
EPA 200.7	Vanadium	mg/L	<0.0050	0.0005	0.0050	W216079	30-Apr-12	
EPA 200.7	Zinc	mg/L	<0.0100	0.0019	0.0100	W216079	30-Apr-12	
EPA 200.8	Antimony	mg/L	<0.00300	0.00012	0.00300	W216085	30-Apr-12	
EPA 200.8	Arsenic	mg/L	<0.0030	0.0002	0.0030	W216085	30-Apr-12	
EPA 200.8	Beryllium	mg/L	<0.000200	0.000077	0.000200	W216085	30-Apr-12	
EPA 200.8	Cadmium	mg/L	<0.00020	0.000013	0.00020	W216085	30-Apr-12	
EPA 200.8	Copper	mg/L	<0.00100	0.000072	0.00100	W216085	30-Apr-12	
EPA 200.8	Lead	mg/L	<0.00300	0.000013	0.00300	W216085	30-Apr-12	
EPA 200.8	Selenium	mg/L	<0.00300	0.00022	0.00300	W216085	30-Apr-12	
EPA 200.8	Silver	mg/L	<0.000100	0.0000074	0.000100	W216085	30-Apr-12	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W2D0302**

Reported: 03-May-12 15:49

Quality Control - BLANK Data (Continued)

Method	Analyte	Units	Result	MDL	MRL	Batch ID	Analyzed	Notes
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Metals (Dissolved) (Continued)

EPA 200.8	Thallium	mg/L	<0.00100	0.0000033	0.00100	W216085	30-Apr-12	
EPA 200.8	Uranium	mg/L	<0.00100	0.0000049	0.00100	W216085	30-Apr-12	
EPA 245.1	Mercury	mg/L	<0.00020	0.000054	0.00020	W216273	23-Apr-12	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	mg/L	<0.005	0.0005	0.005	W216257	19-Apr-12	
EPA 120.1	Specific conductance	µmhos/cm	<5.00		5.00	W216086	17-Apr-12	
EPA 180.1	Turbidity	NTU	<0.100		0.100	W216076	17-Apr-12	
EPA 335.4	Cyanide (total)	mg/L	<0.0100	0.0021	0.0100	W216112	18-Apr-12	
EPA 350.1	Ammonia as N	mg/L	<0.030	0.006	0.030	W216209	25-Apr-12	
EPA 350.1	Ammonia as N	mg/L	<0.030	0.006	0.030	W216210	24-Apr-12	
EPA 353.2	Nitrate/Nitrite as N	mg/L	<0.050	0.008	0.050	W217025	23-Apr-12	
SM 2540 C	Total Diss. Solids	mg/L	<10		10	W216077	17-Apr-12	
SM 2540 C	Total Diss. Solids	mg/L	<10		10	W218190	02-May-12	
SM 2540 D	Total Susp. Solids	mg/L	<5.0		5.0	W216088	17-Apr-12	
SM 4500-CN-I	Cyanide (WAD)	mg/L	<0.0100	0.0006	0.0100	W216113	18-Apr-12	
SM 4500-CN-I	Cyanide (WAD)	mg/L	<0.0100	0.0006	0.0100	W216261	19-Apr-12	
SM 4500-P-E	Phosphorus	mg/L	<0.010	0.005	0.010	W216289	20-Apr-12	
SM 5310B	Total Organic Carbon	mg/L	<1.00	0.27	1.00	W216280	20-Apr-12	

Anions by Ion Chromatography

EPA 300.0	Fluoride	mg/L	<0.10	0.02	0.10	W217062	23-Apr-12	
EPA 300.0	Chloride	mg/L	<0.20	0.07	0.20	W217062	23-Apr-12	
EPA 300.0	Sulfate as SO4	mg/L	<0.30	0.04	0.30	W217062	23-Apr-12	

Quality Control - LABORATORY CONTROL SAMPLE Data

Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	mg/L	0.00502	0.00500	100	85 - 115	W216275	23-Apr-12	
EPA 245.1	Mercury	mg/L	0.00490	0.00500	98.0	85 - 115	W216276	23-Apr-12	

Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	mg/L	1.01	1.00	101	85 - 115	W216078	30-Apr-12	
EPA 200.7	Barium	mg/L	0.987	1.00	98.7	85 - 115	W216078	30-Apr-12	
EPA 200.7	Boron	mg/L	1.00	1.00	100	85 - 115	W216078	30-Apr-12	
EPA 200.7	Calcium	mg/L	19.1	20.0	95.5	85 - 115	W216078	30-Apr-12	
EPA 200.7	Chromium	mg/L	1.02	1.00	102	85 - 115	W216078	30-Apr-12	
EPA 200.7	Cobalt	mg/L	0.984	1.00	98.4	85 - 115	W216078	30-Apr-12	
EPA 200.7	Iron	mg/L	9.61	10.0	96.1	85 - 115	W216078	30-Apr-12	
EPA 200.7	Magnesium	mg/L	19.1	20.0	95.5	85 - 115	W216078	30-Apr-12	
EPA 200.7	Manganese	mg/L	1.00	1.00	100	85 - 115	W216078	30-Apr-12	
EPA 200.7	Molybdenum	mg/L	1.01	1.00	101	85 - 115	W216078	30-Apr-12	
EPA 200.7	Nickel	mg/L	0.989	1.00	98.9	85 - 115	W216078	30-Apr-12	
EPA 200.7	Potassium	mg/L	19.1	20.0	95.6	85 - 115	W216078	30-Apr-12	
EPA 200.7	Silicon	mg/L	4.82	5.00	96.5	85 - 115	W216078	30-Apr-12	
EPA 200.7	Sodium	mg/L	17.9	19.0	94.2	85 - 115	W216078	30-Apr-12	
EPA 200.7	Titanium	mg/L	1.02	1.00	102	85 - 115	W216078	30-Apr-12	
EPA 200.7	Vanadium	mg/L	1.03	1.00	103	85 - 115	W216078	30-Apr-12	
EPA 200.7	Zinc	mg/L	0.928	1.00	92.8	85 - 115	W218096	02-May-12	
EPA 200.8	Antimony	mg/L	0.0288	0.0250	115	85 - 115	W216084	30-Apr-12	
EPA 200.8	Arsenic	mg/L	0.0267	0.0250	107	85 - 115	W216084	30-Apr-12	
EPA 200.8	Copper	mg/L	0.0259	0.0250	104	85 - 115	W216084	30-Apr-12	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245
Work Order: **W2D0302**
Reported: 03-May-12 15:49

Quality Control - LABORATORY CONTROL SAMPLE Data (Continued)

Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Total Recoverable--reportable as Total per 40 CFR 136) (Continued)

EPA 200.8	Lead	mg/L	0.0266	0.0250	106	85 - 115	W216084	30-Apr-12	
EPA 200.8	Selenium	mg/L	0.0270	0.0250	108	85 - 115	W216084	30-Apr-12	
EPA 200.8	Silver	mg/L	0.0266	0.0250	107	85 - 115	W216084	30-Apr-12	
EPA 200.8	Uranium	mg/L	0.0261	0.0250	104	85 - 115	W216084	30-Apr-12	
EPA 200.8	Thallium	mg/L	0.0266	0.0250	106	85 - 115	W216084	30-Apr-12	
EPA 200.8	Cadmium	mg/L	0.0261	0.0250	105	85 - 115	W216084	30-Apr-12	

Metals (Dissolved)

EPA 200.7	Aluminum	mg/L	0.987	1.00	98.7	85 - 115	W216079	30-Apr-12	
EPA 200.7	Barium	mg/L	0.970	1.00	97.0	85 - 115	W216079	30-Apr-12	
EPA 200.7	Boron	mg/L	0.986	1.00	98.6	85 - 115	W216079	30-Apr-12	
EPA 200.7	Calcium	mg/L	18.7	20.0	93.3	85 - 115	W216079	30-Apr-12	
EPA 200.7	Chromium	mg/L	0.969	1.00	96.9	85 - 115	W216079	30-Apr-12	
EPA 200.7	Cobalt	mg/L	0.940	1.00	94.0	85 - 115	W216079	30-Apr-12	
EPA 200.7	Iron	mg/L	9.51	10.0	95.1	85 - 115	W216079	30-Apr-12	
EPA 200.7	Magnesium	mg/L	18.7	20.0	93.6	85 - 115	W216079	30-Apr-12	
EPA 200.7	Manganese	mg/L	0.965	1.00	96.5	85 - 115	W216079	30-Apr-12	
EPA 200.7	Molybdenum	mg/L	0.965	1.00	96.5	85 - 115	W216079	30-Apr-12	
EPA 200.7	Nickel	mg/L	0.930	1.00	93.0	85 - 115	W216079	30-Apr-12	
EPA 200.7	Potassium	mg/L	18.5	20.0	92.4	85 - 115	W216079	30-Apr-12	
EPA 200.7	Silicon	mg/L	4.67	5.00	93.4	85 - 115	W216079	30-Apr-12	
EPA 200.7	Sodium	mg/L	17.6	19.0	92.4	85 - 115	W216079	30-Apr-12	
EPA 200.7	Titanium	mg/L	0.967	1.00	96.7	85 - 115	W216079	30-Apr-12	
EPA 200.7	Vanadium	mg/L	0.978	1.00	97.8	85 - 115	W216079	30-Apr-12	
EPA 200.7	Zinc	mg/L	0.953	1.00	95.3	85 - 115	W216079	30-Apr-12	
EPA 200.8	Antimony	mg/L	0.0257	0.0250	103	85 - 115	W216085	30-Apr-12	
EPA 200.8	Arsenic	mg/L	0.0260	0.0250	104	85 - 115	W216085	30-Apr-12	
EPA 200.8	Beryllium	mg/L	0.0255	0.0250	102	85 - 115	W216085	30-Apr-12	
EPA 200.8	Cadmium	mg/L	0.0260	0.0250	104	85 - 115	W216085	30-Apr-12	
EPA 200.8	Copper	mg/L	0.0255	0.0250	102	85 - 115	W216085	30-Apr-12	
EPA 200.8	Lead	mg/L	0.0261	0.0250	105	85 - 115	W216085	30-Apr-12	
EPA 200.8	Selenium	mg/L	0.0260	0.0250	104	85 - 115	W216085	30-Apr-12	
EPA 200.8	Silver	mg/L	0.0247	0.0250	98.9	85 - 115	W216085	30-Apr-12	
EPA 200.8	Thallium	mg/L	0.0263	0.0250	105	85 - 115	W216085	30-Apr-12	
EPA 200.8	Uranium	mg/L	0.0266	0.0250	106	85 - 115	W216085	30-Apr-12	
EPA 245.1	Mercury	mg/L	0.00544	0.00500	109	85 - 115	W216273	23-Apr-12	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	mg/L	0.158	0.150	105	85 - 115	W216257	19-Apr-12	
EPA 120.1	Specific conductance	µmhos/cm	413	421	98.1	90 - 110	W216086	17-Apr-12	
EPA 180.1	Turbidity	NTU	4.30	4.39	97.9	90 - 110	W216076	17-Apr-12	
EPA 335.4	Cyanide (total)	mg/L	0.153	0.150	102	90 - 110	W216112	18-Apr-12	
EPA 350.1	Ammonia as N	mg/L	0.804	0.750	107	90 - 110	W216210	24-Apr-12	
EPA 350.1	Ammonia as N	mg/L	0.798	0.750	106	90 - 110	W216209	25-Apr-12	
EPA 353.2	Nitrate/Nitrite as N	mg/L	1.84	2.00	92.1	90 - 110	W217025	23-Apr-12	
SM 4500-CN-I	Cyanide (WAD)	mg/L	0.153	0.150	102	90 - 110	W216113	18-Apr-12	
SM 4500-CN-I	Cyanide (WAD)	mg/L	0.155	0.150	103	90 - 110	W216261	19-Apr-12	
SM 4500-P-E	Phosphorus	mg/L	0.740	0.720	103	90 - 110	W216289	20-Apr-12	
SM 5310B	Total Organic Carbon	mg/L	68.4	66.7	103	80 - 120	W216280	20-Apr-12	

Anions by Ion Chromatography

EPA 300.0	Fluoride	mg/L	2.01	2.00	100	90 - 110	W217062	23-Apr-12	
EPA 300.0	Chloride	mg/L	3.06	3.00	102	90 - 110	W217062	23-Apr-12	
EPA 300.0	Sulfate as SO4	mg/L	10.6	10.0	106	90 - 110	W217062	23-Apr-12	



Golder Associates (WA)
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Project Name: Suriname - Merian Gold 2011 / 113-93245
Work Order: **W2D0302**
Reported: 03-May-12 15:49

Quality Control - DUPLICATE Data

Method	Analyte	Units	Duplicate Result	Sample Result	RPD	RPD Limit	Batch ID	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	mg/L	<0.00020	<0.00020	UDL	20	W216275	23-Apr-12	
EPA 245.1	Mercury	mg/L	<0.00020	<0.00020	UDL	20	W216276	23-Apr-12	

Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	mg/L	0.255	0.281	9.8	20	W216078	30-Apr-12	
EPA 200.7	Barium	mg/L	0.0063	0.0063	0.4	20	W216078	30-Apr-12	
EPA 200.7	Boron	mg/L	<0.040	<0.040	<RL	20	W216078	30-Apr-12	
EPA 200.7	Calcium	mg/L	0.330	0.323	2.2	20	W216078	30-Apr-12	
EPA 200.7	Chromium	mg/L	<0.0060	<0.0060	<RL	20	W216078	30-Apr-12	
EPA 200.7	Cobalt	mg/L	<0.0060	<0.0060	UDL	20	W216078	30-Apr-12	
EPA 200.7	Iron	mg/L	0.403	0.402	0.2	20	W216078	30-Apr-12	
EPA 200.7	Magnesium	mg/L	0.133	0.135	1.2	20	W216078	30-Apr-12	
EPA 200.7	Manganese	mg/L	0.0428	0.0418	2.3	20	W216078	30-Apr-12	
EPA 200.7	Molybdenum	mg/L	<0.008	<0.008	<RL	20	W216078	30-Apr-12	
EPA 200.7	Nickel	mg/L	<0.010	<0.010	<RL	20	W216078	30-Apr-12	
EPA 200.7	Potassium	mg/L	0.84	0.85	0.8	20	W216078	30-Apr-12	
EPA 200.7	Silicon	mg/L	11.2	11.1	1.6	20	W216078	30-Apr-12	
EPA 200.7	Sodium	mg/L	12.3	12.2	1.0	20	W216078	30-Apr-12	
EPA 200.7	Titanium	mg/L	<0.0050	<0.0050	<RL	20	W216078	30-Apr-12	
EPA 200.7	Vanadium	mg/L	<0.0050	<0.0050	UDL	20	W216078	30-Apr-12	
EPA 200.7	Zinc	mg/L	0.0550	0.0523	4.9	20	W218096	02-May-12	
EPA 200.8	Antimony	mg/L	<0.00300	<0.00300	UDL	20	W216084	30-Apr-12	
EPA 200.8	Arsenic	mg/L	<0.0030	<0.0030	<RL	20	W216084	30-Apr-12	
EPA 200.8	Beryllium	mg/L	<0.000400	<0.000400	UDL	20	W216084	30-Apr-12	D5
EPA 200.8	Copper	mg/L	0.00162	0.00169	3.8	20	W216084	30-Apr-12	
EPA 200.8	Lead	mg/L	<0.00300	<0.00300	<RL	20	W216084	30-Apr-12	
EPA 200.8	Selenium	mg/L	<0.00300	<0.00300	UDL	20	W216084	30-Apr-12	
EPA 200.8	Silver	mg/L	<0.000100	<0.000100	<RL	20	W216084	30-Apr-12	
EPA 200.8	Uranium	mg/L	<0.00100	<0.00100	<RL	20	W216084	30-Apr-12	
EPA 200.8	Thallium	mg/L	<0.00100	<0.00100	<RL	20	W216084	30-Apr-12	
EPA 200.8	Cadmium	mg/L	<0.00020	<0.00020	<RL	20	W216084	30-Apr-12	

Metals (Dissolved)

EPA 200.7	Aluminum	mg/L	0.121	0.120	1.0	20	W216079	30-Apr-12	
EPA 200.7	Barium	mg/L	0.0031	0.0030	3.5	20	W216079	30-Apr-12	
EPA 200.7	Boron	mg/L	<0.040	<0.040	<RL	20	W216079	30-Apr-12	
EPA 200.7	Calcium	mg/L	0.325	0.327	0.6	20	W216079	30-Apr-12	
EPA 200.7	Chromium	mg/L	<0.0060	<0.0060	UDL	20	W216079	30-Apr-12	
EPA 200.7	Cobalt	mg/L	<0.0060	<0.0060	UDL	20	W216079	30-Apr-12	
EPA 200.7	Iron	mg/L	0.160	0.156	2.7	20	W216079	30-Apr-12	
EPA 200.7	Magnesium	mg/L	0.091	0.083	8.7	20	W216079	30-Apr-12	
EPA 200.7	Manganese	mg/L	0.0273	0.0272	0.3	20	W216079	30-Apr-12	
EPA 200.7	Molybdenum	mg/L	<0.008	<0.008	UDL	20	W216079	30-Apr-12	
EPA 200.7	Nickel	mg/L	<0.010	<0.010	UDL	20	W216079	30-Apr-12	
EPA 200.7	Potassium	mg/L	0.90	0.90	0.2	20	W216079	30-Apr-12	
EPA 200.7	Silicon	mg/L	11.0	10.9	0.5	20	W216079	30-Apr-12	
EPA 200.7	Sodium	mg/L	12.3	12.3	0.3	20	W216079	30-Apr-12	
EPA 200.7	Titanium	mg/L	<0.0050	<0.0050	UDL	20	W216079	30-Apr-12	
EPA 200.7	Vanadium	mg/L	<0.0050	<0.0050	UDL	20	W216079	30-Apr-12	
EPA 200.7	Zinc	mg/L	0.0294	0.0291	1.0	20	W216079	30-Apr-12	
EPA 200.8	Antimony	mg/L	<0.00300	<0.00300	<RL	20	W216085	30-Apr-12	
EPA 200.8	Arsenic	mg/L	<0.0030	<0.0030	UDL	20	W216085	30-Apr-12	
EPA 200.8	Beryllium	mg/L	<0.000200	<0.000200	UDL	20	W216085	30-Apr-12	
EPA 200.8	Cadmium	mg/L	<0.00020	<0.00020	<RL	20	W216085	30-Apr-12	
EPA 200.8	Copper	mg/L	0.00106	0.00107	0.7	20	W216085	30-Apr-12	
EPA 200.8	Lead	mg/L	<0.00300	<0.00300	<RL	20	W216085	30-Apr-12	
EPA 200.8	Selenium	mg/L	<0.00300	<0.00300	UDL	20	W216085	30-Apr-12	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245
Work Order: **W2D0302**
Reported: 03-May-12 15:49

Quality Control - DUPLICATE Data (Continued)

Method	Analyte	Units	Duplicate Result	Sample Result	RPD	RPD Limit	Batch ID	Analyzed	Notes
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Metals (Dissolved) (Continued)

EPA 200.8	Silver	mg/L	<0.000100	<0.000100	UDL	20	W216085	30-Apr-12	
EPA 200.8	Thallium	mg/L	<0.00100	<0.00100	<RL	20	W216085	30-Apr-12	
EPA 200.8	Uranium	mg/L	<0.00100	<0.00100	<RL	20	W216085	30-Apr-12	
EPA 245.1	Mercury	mg/L	<0.00020	<0.00020	UDL	20	W216273	23-Apr-12	

Classical Chemistry Parameters

EPA 120.1	Specific conductance	µmhos/cm	269	269	0.0	20	W216086	17-Apr-12	
EPA 120.1	Specific conductance	µmhos/cm	46.1	49.3	6.7	20	W216086	17-Apr-12	
EPA 180.1	Turbidity	NTU	2.06	2.28	10.1	20	W216076	17-Apr-12	
EPA 335.4	Cyanide (total)	mg/L	<0.0100	<0.0100	UDL	20	W216112	18-Apr-12	
EPA 350.1	Ammonia as N	mg/L	0.257	0.249	2.9	20	W216210	24-Apr-12	
EPA 350.1	Ammonia as N	mg/L	0.656	0.630	4.1	20	W216209	25-Apr-12	
EPA 353.2	Nitrate/Nitrite as N	mg/L	0.140	0.133	5.2	20	W217025	23-Apr-12	
SM 2320B/2310B	Total Alkalinity	mg/L	15.7	14.9	5.3	20	W216176	19-Apr-12	
SM 2320B/2310B	Total Alkalinity	mg/L	196	198	0.9	20	W216176	19-Apr-12	
SM 2320B/2310B	Bicarbonate	mg/L	15.7	14.9	5.3	20	W216176	19-Apr-12	
SM 2320B/2310B	Bicarbonate	mg/L	196	198	0.9	20	W216176	19-Apr-12	
SM 2320B/2310B	Carbonate	mg/L	<1.0	<1.0	UDL	20	W216176	19-Apr-12	
SM 2320B/2310B	Carbonate	mg/L	<1.0	<1.0	UDL	20	W216176	19-Apr-12	
SM 2540 C	Total Diss. Solids	mg/L	206	220	6.6	10	W218190	02-May-12	
SM 2540 C	Total Diss. Solids	mg/L	259	258	0.4	10	W216077	17-Apr-12	
SM 2540 C	Total Diss. Solids	mg/L	284	282	0.7	10	W216077	17-Apr-12	
SM 2540 D	Total Susp. Solids	mg/L	<5.0	<5.0	<RL	10	W216088	17-Apr-12	
SM 2540 D	Total Susp. Solids	mg/L	<5.0	<5.0	<RL	10	W216088	17-Apr-12	
SM 4500 H B	pH	pH Units	6.03	6.03	0.0	20	W216176	19-Apr-12	
SM 4500 H B	pH	pH Units	7.56	7.62	0.8	20	W216176	19-Apr-12	
SM 4500-CN-I	Cyanide (WAD)	mg/L	<0.0100	<0.0100	<RL	20	W216113	18-Apr-12	
SM 4500-CN-I	Cyanide (WAD)	mg/L	<0.0100	<0.0100	UDL	20	W216261	19-Apr-12	
SM 4500-P-E	Phosphorus	mg/L	<0.010	0.010	<RL	20	W216289	20-Apr-12	
SM 5310B	Total Organic Carbon	mg/L	3.79	3.41	10.4	20	W216280	20-Apr-12	

Anions by Ion Chromatography

EPA 300.0	Fluoride	mg/L	<0.10	<0.10	<RL	20	W217062	23-Apr-12	
EPA 300.0	Chloride	mg/L	1.27	1.24	2.4	20	W217062	23-Apr-12	
EPA 300.0	Sulfate as SO4	mg/L	16.4	16.4	0.1	20	W217062	23-Apr-12	

Quality Control - MATRIX SPIKE Data

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	mg/L	0.00102	<0.00020	0.00100	102	70 - 130	W216275	23-Apr-12	
EPA 245.1	Mercury	mg/L	0.00101	<0.00020	0.00100	101	70 - 130	W216276	23-Apr-12	
EPA 245.1	Mercury	mg/L	0.00100	<0.00020	0.00100	100	70 - 130	W216276	23-Apr-12	
EPA 245.1	Mercury	mg/L	0.0153	<0.00100	0.00100	1530	70 - 130	W216275	23-Apr-12	M3

Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	mg/L	2.14	0.281	1.00	186	70 - 130	W216078	30-Apr-12	M1
EPA 200.7	Aluminum	mg/L	1.20	<0.080	1.00	114	70 - 130	W216078	30-Apr-12	
EPA 200.7	Barium	mg/L	1.03	0.0063	1.00	102	70 - 130	W216078	30-Apr-12	
EPA 200.7	Barium	mg/L	1.04	0.0278	1.00	101	70 - 130	W216078	30-Apr-12	
EPA 200.7	Boron	mg/L	1.06	<0.040	1.00	105	70 - 130	W216078	30-Apr-12	
EPA 200.7	Boron	mg/L	1.06	<0.040	1.00	105	70 - 130	W216078	30-Apr-12	
EPA 200.7	Calcium	mg/L	20.1	0.323	20.0	98.9	70 - 130	W216078	30-Apr-12	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



Golder Associates (WA)
 18300 NE Union Hill Road, Suite 200
 Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245
 Work Order: **W2D0302**
 Reported: 03-May-12 15:49

Quality Control - MATRIX SPIKE Data (Continued)

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Total Recoverable--reportable as Total per 40 CFR 136) (Continued)

EPA 200.7	Calcium	mg/L	47.3	27.8	20.0	97.5	70 - 130	W216078	30-Apr-12	
EPA 200.7	Chromium	mg/L	1.06	<0.0060	1.00	105	70 - 130	W216078	30-Apr-12	
EPA 200.7	Chromium	mg/L	1.05	<0.0060	1.00	105	70 - 130	W216078	30-Apr-12	
EPA 200.7	Cobalt	mg/L	1.02	<0.0060	1.00	102	70 - 130	W216078	30-Apr-12	
EPA 200.7	Cobalt	mg/L	1.00	<0.0060	1.00	100	70 - 130	W216078	30-Apr-12	
EPA 200.7	Iron	mg/L	10.7	0.402	10.0	103	70 - 130	W216078	30-Apr-12	
EPA 200.7	Iron	mg/L	10.3	0.356	10.0	99.9	70 - 130	W216078	30-Apr-12	
EPA 200.7	Magnesium	mg/L	20.4	0.135	20.0	101	70 - 130	W216078	30-Apr-12	
EPA 200.7	Magnesium	mg/L	31.0	11.4	20.0	97.8	70 - 130	W216078	30-Apr-12	
EPA 200.7	Manganese	mg/L	1.10	0.0418	1.00	106	70 - 130	W216078	30-Apr-12	
EPA 200.7	Manganese	mg/L	1.20	0.157	1.00	104	70 - 130	W216078	30-Apr-12	
EPA 200.7	Molybdenum	mg/L	1.04	<0.008	1.00	104	70 - 130	W216078	30-Apr-12	
EPA 200.7	Molybdenum	mg/L	1.03	<0.008	1.00	103	70 - 130	W216078	30-Apr-12	
EPA 200.7	Nickel	mg/L	1.03	<0.010	1.00	103	70 - 130	W216078	30-Apr-12	
EPA 200.7	Nickel	mg/L	1.03	<0.010	1.00	102	70 - 130	W216078	30-Apr-12	
EPA 200.7	Potassium	mg/L	20.4	0.85	20.0	98.0	70 - 130	W216078	30-Apr-12	
EPA 200.7	Potassium	mg/L	20.6	0.95	20.0	98.3	70 - 130	W216078	30-Apr-12	
EPA 200.7	Silicon	mg/L	18.5	11.1	5.00	149	70 - 130	W216078	30-Apr-12	M1
EPA 200.7	Silicon	mg/L	25.5	20.3	5.00	105	70 - 130	W216078	30-Apr-12	
EPA 200.7	Sodium	mg/L	30.7	12.2	19.0	97.6	70 - 130	W216078	30-Apr-12	
EPA 200.7	Sodium	mg/L	61.6	43.3	19.0	96.3	70 - 130	W216078	30-Apr-12	
EPA 200.7	Titanium	mg/L	1.04	<0.0050	1.00	104	70 - 130	W216078	30-Apr-12	
EPA 200.7	Titanium	mg/L	1.04	<0.0050	1.00	104	70 - 130	W216078	30-Apr-12	
EPA 200.7	Vanadium	mg/L	1.06	<0.0050	1.00	106	70 - 130	W216078	30-Apr-12	
EPA 200.7	Vanadium	mg/L	1.06	<0.0050	1.00	106	70 - 130	W216078	30-Apr-12	
EPA 200.7	Zinc	mg/L	0.993	0.0523	1.00	94.1	70 - 130	W218096	02-May-12	
EPA 200.7	Zinc	mg/L	0.943	<0.0100	1.00	94.3	70 - 130	W218096	02-May-12	
EPA 200.8	Antimony	mg/L	0.0286	<0.00300	0.0250	114	70 - 130	W216084	30-Apr-12	
EPA 200.8	Antimony	mg/L	0.0290	<0.00300	0.0250	114	70 - 130	W216084	30-Apr-12	
EPA 200.8	Arsenic	mg/L	0.0269	<0.0030	0.0250	106	70 - 130	W216084	30-Apr-12	
EPA 200.8	Arsenic	mg/L	0.0290	<0.0030	0.0250	111	70 - 130	W216084	30-Apr-12	
EPA 200.8	Beryllium	mg/L	0.0251	<0.000400	0.0250	100	70 - 130	W216084	30-Apr-12	D5
EPA 200.8	Beryllium	mg/L	0.0242	<0.000400	0.0250	96.9	70 - 130	W216084	30-Apr-12	D5
EPA 200.8	Copper	mg/L	0.0278	0.00169	0.0250	105	70 - 130	W216084	30-Apr-12	
EPA 200.8	Copper	mg/L	0.0273	<0.00100	0.0250	106	70 - 130	W216084	30-Apr-12	
EPA 200.8	Lead	mg/L	0.0273	<0.00300	0.0250	102	70 - 130	W216084	30-Apr-12	
EPA 200.8	Lead	mg/L	0.0247	<0.00300	0.0250	97.5	70 - 130	W216084	30-Apr-12	
EPA 200.8	Selenium	mg/L	0.0259	<0.00300	0.0250	103	70 - 130	W216084	30-Apr-12	
EPA 200.8	Selenium	mg/L	0.0267	<0.00300	0.0250	105	70 - 130	W216084	30-Apr-12	
EPA 200.8	Silver	mg/L	0.0261	<0.000100	0.0250	104	70 - 130	W216084	30-Apr-12	
EPA 200.8	Silver	mg/L	0.0258	<0.000100	0.0250	103	70 - 130	W216084	30-Apr-12	
EPA 200.8	Uranium	mg/L	0.0254	<0.00100	0.0250	100	70 - 130	W216084	30-Apr-12	
EPA 200.8	Uranium	mg/L	0.0250	<0.00100	0.0250	98.9	70 - 130	W216084	30-Apr-12	
EPA 200.8	Thallium	mg/L	0.0258	<0.00100	0.0250	103	70 - 130	W216084	30-Apr-12	
EPA 200.8	Thallium	mg/L	0.0247	<0.00100	0.0250	99.0	70 - 130	W216084	30-Apr-12	
EPA 200.8	Cadmium	mg/L	0.0263	<0.00020	0.0250	105	70 - 130	W216084	30-Apr-12	
EPA 200.8	Cadmium	mg/L	0.0261	<0.00020	0.0250	105	70 - 130	W216084	30-Apr-12	

Metals (Dissolved)

EPA 200.7	Aluminum	mg/L	1.08	0.120	1.00	96.3	70 - 130	W216079	30-Apr-12	
EPA 200.7	Aluminum	mg/L	1.04	<0.080	1.00	101	70 - 130	W216079	30-Apr-12	
EPA 200.7	Barium	mg/L	0.957	0.0030	1.00	95.4	70 - 130	W216079	30-Apr-12	
EPA 200.7	Barium	mg/L	1.03	0.0275	1.00	100	70 - 130	W216079	30-Apr-12	
EPA 200.7	Boron	mg/L	0.977	<0.040	1.00	96.9	70 - 130	W216079	30-Apr-12	
EPA 200.7	Boron	mg/L	1.03	<0.040	1.00	102	70 - 130	W216079	30-Apr-12	
EPA 200.7	Calcium	mg/L	19.7	0.327	20.0	96.7	70 - 130	W216079	30-Apr-12	
EPA 200.7	Calcium	mg/L	47.1	28.0	20.0	95.6	70 - 130	W216079	30-Apr-12	

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Golder Associates (WA)
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 Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W2D0302**

Reported: 03-May-12 15:49

Quality Control - MATRIX SPIKE Data (Continued)

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Dissolved) (Continued)

EPA 200.7	Chromium	mg/L	1.00	<0.0060	1.00	100	70 - 130	W216079	30-Apr-12	
EPA 200.7	Chromium	mg/L	0.999	<0.0060	1.00	99.9	70 - 130	W216079	30-Apr-12	
EPA 200.7	Cobalt	mg/L	0.980	<0.0060	1.00	97.9	70 - 130	W216079	30-Apr-12	
EPA 200.7	Cobalt	mg/L	0.963	<0.0060	1.00	96.3	70 - 130	W216079	30-Apr-12	
EPA 200.7	Iron	mg/L	10.1	0.156	10.0	99.9	70 - 130	W216079	30-Apr-12	
EPA 200.7	Iron	mg/L	10.3	0.313	10.0	100	70 - 130	W216079	30-Apr-12	
EPA 200.7	Magnesium	mg/L	19.8	0.083	20.0	98.5	70 - 130	W216079	30-Apr-12	
EPA 200.7	Magnesium	mg/L	30.7	11.7	20.0	95.0	70 - 130	W216079	30-Apr-12	
EPA 200.7	Manganese	mg/L	1.02	0.0272	1.00	99.7	70 - 130	W216079	30-Apr-12	
EPA 200.7	Manganese	mg/L	1.14	0.161	1.00	98.4	70 - 130	W216079	30-Apr-12	
EPA 200.7	Molybdenum	mg/L	0.989	<0.008	1.00	98.9	70 - 130	W216079	30-Apr-12	
EPA 200.7	Molybdenum	mg/L	0.980	<0.008	1.00	97.7	70 - 130	W216079	30-Apr-12	
EPA 200.7	Nickel	mg/L	0.976	<0.010	1.00	97.6	70 - 130	W216079	30-Apr-12	
EPA 200.7	Nickel	mg/L	0.967	<0.010	1.00	96.7	70 - 130	W216079	30-Apr-12	
EPA 200.7	Potassium	mg/L	19.7	0.90	20.0	94.0	70 - 130	W216079	30-Apr-12	
EPA 200.7	Potassium	mg/L	19.9	1.06	20.0	94.0	70 - 130	W216079	30-Apr-12	
EPA 200.7	Silicon	mg/L	15.8	10.9	5.00	98.6	70 - 130	W216079	30-Apr-12	
EPA 200.7	Silicon	mg/L	24.8	19.9	5.00	97.1	70 - 130	W216079	30-Apr-12	
EPA 200.7	Sodium	mg/L	29.8	12.3	19.0	92.3	70 - 130	W216079	30-Apr-12	
EPA 200.7	Sodium	mg/L	58.2	42.1	19.0	85.0	70 - 130	W216079	30-Apr-12	
EPA 200.7	Titanium	mg/L	0.997	<0.0050	1.00	99.6	70 - 130	W216079	30-Apr-12	
EPA 200.7	Titanium	mg/L	1.00	<0.0050	1.00	100	70 - 130	W216079	30-Apr-12	
EPA 200.7	Vanadium	mg/L	1.00	<0.0050	1.00	100	70 - 130	W216079	30-Apr-12	
EPA 200.7	Vanadium	mg/L	1.01	<0.0050	1.00	101	70 - 130	W216079	30-Apr-12	
EPA 200.7	Zinc	mg/L	1.03	0.0291	1.00	101	70 - 130	W216079	30-Apr-12	
EPA 200.7	Zinc	mg/L	0.987	<0.0100	1.00	98.7	70 - 130	W216079	30-Apr-12	
EPA 200.8	Antimony	mg/L	0.0270	<0.00300	0.0250	105	70 - 130	W216085	30-Apr-12	
EPA 200.8	Antimony	mg/L	0.0258	<0.00300	0.0250	101	70 - 130	W216085	30-Apr-12	
EPA 200.8	Arsenic	mg/L	0.0288	<0.0030	0.0250	115	70 - 130	W216085	30-Apr-12	
EPA 200.8	Arsenic	mg/L	0.0309	<0.0030	0.0250	116	70 - 130	W216085	30-Apr-12	
EPA 200.8	Beryllium	mg/L	0.0247	<0.000200	0.0250	98.7	70 - 130	W216085	30-Apr-12	
EPA 200.8	Beryllium	mg/L	0.0234	<0.000200	0.0250	93.8	70 - 130	W216085	30-Apr-12	
EPA 200.8	Cadmium	mg/L	0.0271	<0.00020	0.0250	108	70 - 130	W216085	30-Apr-12	
EPA 200.8	Cadmium	mg/L	0.0257	<0.00020	0.0250	103	70 - 130	W216085	30-Apr-12	
EPA 200.8	Copper	mg/L	0.0270	0.00107	0.0250	104	70 - 130	W216085	30-Apr-12	
EPA 200.8	Copper	mg/L	0.0260	<0.00100	0.0250	101	70 - 130	W216085	30-Apr-12	
EPA 200.8	Lead	mg/L	0.0265	<0.00300	0.0250	101	70 - 130	W216085	30-Apr-12	
EPA 200.8	Lead	mg/L	0.0241	<0.00300	0.0250	96.2	70 - 130	W216085	30-Apr-12	
EPA 200.8	Selenium	mg/L	0.0306	<0.00300	0.0250	122	70 - 130	W216085	30-Apr-12	
EPA 200.8	Selenium	mg/L	0.0302	<0.00300	0.0250	120	70 - 130	W216085	30-Apr-12	
EPA 200.8	Silver	mg/L	0.0253	<0.000100	0.0250	101	70 - 130	W216085	30-Apr-12	
EPA 200.8	Silver	mg/L	0.0210	<0.000100	0.0250	84.0	70 - 130	W216085	30-Apr-12	
EPA 200.8	Thallium	mg/L	0.0255	<0.00100	0.0250	102	70 - 130	W216085	30-Apr-12	
EPA 200.8	Thallium	mg/L	0.0245	<0.00100	0.0250	98.1	70 - 130	W216085	30-Apr-12	
EPA 200.8	Uranium	mg/L	0.0258	<0.00100	0.0250	102	70 - 130	W216085	30-Apr-12	
EPA 200.8	Uranium	mg/L	0.0250	<0.00100	0.0250	98.9	70 - 130	W216085	30-Apr-12	
EPA 245.1	Mercury	mg/L	0.00101	<0.00020	0.00100	101	70 - 130	W216273	23-Apr-12	
EPA 245.1	Mercury	mg/L	0.00112	<0.00020	0.00100	112	70 - 130	W216273	23-Apr-12	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	mg/L	0.099	<0.005	0.100	99.0	85 - 115	W216257	19-Apr-12	
ASTM D7237	Cyanide (free)	mg/L	0.101	<0.005	0.100	101	85 - 115	W216257	19-Apr-12	
EPA 335.4	Cyanide (total)	mg/L	0.103	<0.0100	0.100	103	90 - 110	W216112	18-Apr-12	
EPA 335.4	Cyanide (total)	mg/L	0.104	<0.0100	0.100	104	90 - 110	W216112	18-Apr-12	
EPA 350.1	Ammonia as N	mg/L	0.761	0.249	0.500	102	90 - 110	W216210	24-Apr-12	
EPA 350.1	Ammonia as N	mg/L	15.5	15.3	0.500	R > 4S	90 - 110	W216210	24-Apr-12	D2,M3
EPA 350.1	Ammonia as N	mg/L	1.21	0.630	0.500	115	90 - 110	W216209	25-Apr-12	M1

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 18300 NE Union Hill Road, Suite 200
 Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W2D0302**

Reported: 03-May-12 15:49

Quality Control - MATRIX SPIKE Data (Continued)

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
Classical Chemistry Parameters (Continued)										
EPA 350.1	Ammonia as N	mg/L	0.541	<0.030	0.500	105	90 - 110	W216209	25-Apr-12	
EPA 353.2	Nitrate/Nitrite as N	mg/L	1.26	0.133	1.00	113	90 - 110	W217025	23-Apr-12	M1
EPA 353.2	Nitrate/Nitrite as N	mg/L	15.3	14.1	1.00	R > 4S	90 - 110	W217025	23-Apr-12	D2,M3
SM 4500-CN-I	Cyanide (WAD)	mg/L	0.105	<0.0100	0.100	101	75 - 125	W216113	18-Apr-12	
SM 4500-CN-I	Cyanide (WAD)	mg/L	0.107	<0.0100	0.100	102	75 - 125	W216113	18-Apr-12	
SM 4500-CN-I	Cyanide (WAD)	mg/L	0.0990	<0.0100	0.100	99.0	75 - 125	W216261	19-Apr-12	
SM 4500-P-E	Phosphorus	mg/L	0.505	0.010	0.500	99.0	75 - 125	W216289	20-Apr-12	
SM 5310B	Total Organic Carbon	mg/L	57.7	3.41	50.0	109	75 - 125	W216280	20-Apr-12	

Anions by Ion Chromatography

EPA 300.0	Fluoride	mg/L	2.05	<0.10	2.00	99.4	90 - 110	W217062	23-Apr-12	
EPA 300.0	Fluoride	mg/L	2.06	<0.10	2.00	103	90 - 110	W217062	23-Apr-12	
EPA 300.0	Chloride	mg/L	4.21	1.24	3.00	99.2	90 - 110	W217062	23-Apr-12	
EPA 300.0	Chloride	mg/L	3.08	<0.20	3.00	103	90 - 110	W217062	23-Apr-12	
EPA 300.0	Sulfate as SO4	mg/L	27.3	16.4	10.0	109	90 - 110	W217062	23-Apr-12	
EPA 300.0	Sulfate as SO4	mg/L	10.6	<0.30	10.0	106	90 - 110	W217062	23-Apr-12	

Quality Control - MATRIX SPIKE DUPLICATE Data

Method	Analyte	Units	MSD Result	Spike Result	Spike Level	RPD	RPD Limit	Batch ID	Analyzed	Notes
Classical Chemistry Parameters										
ASTM D7237	Cyanide (free)	mg/L	0.100	0.099	0.100	1.0	20	W216257	19-Apr-12	
ASTM D7237	Cyanide (free)	mg/L	0.103	0.101	0.100	2.0	20	W216257	19-Apr-12	

Quality Control - POST DIGESTION SPIKE Data

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
Metals (Total Recoverable--reportable as Total per 40 CFR 136)										
EPA 200.7	Aluminum	mg/L	1.15	0.281	1.00	86.5	85 - 115	W216078	30-Apr-12	
EPA 200.7	Silicon	mg/L	14.8	11.1	5.00	75.1	85 - 115	W216078	30-Apr-12	M2



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W2D0302**

Reported: 03-May-12 15:49

Notes and Definitions

D2	Sample required dilution due to high concentration of target analyte.
D5	Sample required dilution to meet internal standard recovery limits.
H3	Sample was received and analyzed past holding time.
H5	This test is specified to be performed in the field within 15 minutes of sampling; sample was received and analyzed past the regulatory holding time.
M1	Matrix spike recovery was high, but the LCS recovery was acceptable.
M2	Matrix spike recovery was low, but the LCS recovery was acceptable.
M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to spike level. The LCS was acceptable.
N3	treated with CdCO ₃ for possible Sulfide interference
LCS	Laboratory Control Sample (Blank Spike)
RPD	Relative Percent Difference
UDL	A result is less than the detection limit
R > 4S	% recovery not applicable, sample concentration more than four times greater than spike level
<RL	A result is less than the reporting limit
MRL	Method Reporting Limit
MDL	Method Detection Limit
N/A	Not Applicable



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: **Suriname Merian 2012 / 113-93245**

Work Order: **W2E0270**

Reported: 29-May-12 10:31

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Sampled By	Date Received
24APR12GW001	W2E0270-01	Ground Water	24-Apr-12 10:48	MA	09-May-2012
24APR12GW002	W2E0270-02	Ground Water	24-Apr-12 11:49	MA	09-May-2012
24APR12GW102	W2E0270-03	Ground Water	24-Apr-12 11:49	MA	09-May-2012
24APR12GW003	W2E0270-04	Ground Water	24-Apr-12 15:37	MA	09-May-2012
25APR12GW004	W2E0270-05	Ground Water	25-Apr-12 10:28	MA	09-May-2012
25APR12GW005	W2E0270-06	Ground Water	25-Apr-12 15:50	MA	09-May-2012
26APR12GW006	W2E0270-07	Ground Water	26-Apr-12 15:32	MA	09-May-2012
27APR12GW007	W2E0270-08	Ground Water	27-Apr-12 10:20	MA	09-May-2012
27APR12GW008	W2E0270-09	Ground Water	27-Apr-12 15:31	MA	09-May-2012
28APR12GW009	W2E0270-10	Ground Water	27-Apr-12 10:27	MA	09-May-2012

Solid samples are analyzed on an as-received, wet-weight basis, unless otherwise requested. Non-Detects are reported at the MDL.

Sample preparation is defined by the client as per their Data Quality Objectives.

This report supercedes any previous reports for this Work Order. The complete report includes pages for each sample, a full QC report, and a notes section.

The results presented in this report relate only to the samples, and meet all requirements of the NELAC Standards unless otherwise noted.

(Q6) SVL received the following containers outside of published EPA guidelines for preservation temperatures (0-6°C).

The guidelines do not pertain to nitric-preserved metals.

Default Cooler (Received Temperature: 20.2°C)

Labnumber	Container	Client ID	Labnumber	Container	Client ID
W2E0270-01 A	Raw HDPE	24APR12GW001	W2E0270-01 B	Sulfuric HDPE	24APR12GW001
W2E0270-01 C	Filtered nitric HDPE	24APR12GW001	W2E0270-01 D	Nitric HDPE	24APR12GW001
W2E0270-01 E	NaOH HDPE	24APR12GW001	W2E0270-02 A	Raw HDPE	24APR12GW002
W2E0270-02 B	Sulfuric HDPE	24APR12GW002	W2E0270-02 C	Filtered nitric HDPE	24APR12GW002
W2E0270-02 D	Nitric HDPE	24APR12GW002	W2E0270-02 E	NaOH HDPE	24APR12GW002
W2E0270-03 A	Raw HDPE	24APR12GW102	W2E0270-03 B	Sulfuric HDPE	24APR12GW102
W2E0270-03 C	Filtered nitric HDPE	24APR12GW102	W2E0270-03 D	Nitric HDPE	24APR12GW102
W2E0270-03 E	NaOH HDPE	24APR12GW102	W2E0270-04 A	Raw HDPE	24APR12GW003
W2E0270-04 B	Sulfuric HDPE	24APR12GW003	W2E0270-04 C	Filtered nitric HDPE	24APR12GW003
W2E0270-04 D	Nitric HDPE	24APR12GW003	W2E0270-04 E	NaOH HDPE	24APR12GW003
W2E0270-05 A	Raw HDPE	25APR12GW004	W2E0270-05 B	Sulfuric HDPE	25APR12GW004
W2E0270-05 C	Filtered nitric HDPE	25APR12GW004	W2E0270-05 D	Nitric HDPE	25APR12GW004
W2E0270-05 E	NaOH HDPE	25APR12GW004	W2E0270-06 A	Raw HDPE	25APR12GW005
W2E0270-06 B	Sulfuric HDPE	25APR12GW005	W2E0270-06 C	Filtered nitric HDPE	25APR12GW005
W2E0270-06 D	Nitric HDPE	25APR12GW005	W2E0270-06 E	NaOH HDPE	25APR12GW005
W2E0270-07 A	Raw HDPE	26APR12GW006	W2E0270-07 B	Sulfuric HDPE	26APR12GW006
W2E0270-07 C	Filtered nitric HDPE	26APR12GW006	W2E0270-07 D	Nitric HDPE	26APR12GW006
W2E0270-07 E	NaOH HDPE	26APR12GW006	W2E0270-08 A	Raw HDPE	27APR12GW007
W2E0270-08 B	Sulfuric HDPE	27APR12GW007	W2E0270-08 C	Filtered nitric HDPE	27APR12GW007
W2E0270-08 D	Nitric HDPE	27APR12GW007	W2E0270-08 E	NaOH HDPE	27APR12GW007
W2E0270-09 A	Raw HDPE	27APR12GW008	W2E0270-09 B	Sulfuric HDPE	27APR12GW008
W2E0270-09 C	Filtered nitric HDPE	27APR12GW008	W2E0270-09 D	Nitric HDPE	27APR12GW008
W2E0270-09 E	NaOH HDPE	27APR12GW008	W2E0270-10 A	Raw HDPE	28APR12GW009
W2E0270-10 B	Sulfuric HDPE	28APR12GW009	W2E0270-10 C	Filtered nitric HDPE	28APR12GW009
W2E0270-10 D	Nitric HDPE	28APR12GW009	W2E0270-10 E	NaOH HDPE	28APR12GW009



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2E0270**
Reported: 29-May-12 10:31

Client Sample ID: **24APR12GW001**

SVL Sample ID: **W2E0270-01 (Ground Water)**

Sample Report Page 1 of 3

Sampled: 24-Apr-12 10:48
Received: 09-May-12
Sampled By: MA

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000054		W220516	DJA	05/21/12 15:19	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	0.181	mg/L	0.080	0.011		W220081	AS	05/26/12 09:31	
EPA 200.7	Barium	0.0061	mg/L	0.0020	0.0003		W220081	AS	05/26/12 09:31	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.007		W220081	AS	05/26/12 09:31	
EPA 200.7	Calcium	0.310	mg/L	0.040	0.006		W220081	AS	05/26/12 09:31	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0008		W220081	AS	05/26/12 09:31	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0007		W220081	AS	05/26/12 09:31	
EPA 200.7	Iron	0.261	mg/L	0.060	0.011		W220081	AS	05/26/12 09:31	
EPA 200.7	Magnesium	0.133	mg/L	0.060	0.013		W220081	AS	05/26/12 09:31	
EPA 200.7	Manganese	0.0415	mg/L	0.0040	0.0007		W220081	AS	05/26/12 09:31	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W220081	AS	05/26/12 09:31	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W220081	AS	05/26/12 09:31	
EPA 200.7	Potassium	0.85	mg/L	0.50	0.08		W220081	AS	05/26/12 09:31	
EPA 200.7	Silicon	11.5	mg/L	0.08	0.01		W220081	AS	05/26/12 09:31	
EPA 200.7	Sodium	11.4	mg/L	0.50	0.07		W220081	AS	05/26/12 09:31	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0002		W220081	AS	05/26/12 09:31	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0004		W220081	AS	05/26/12 09:31	
EPA 200.7	Zinc	0.0367	mg/L	0.0100	0.0013		W220081	AS	05/26/12 09:31	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W219367	KWH	05/23/12 09:53	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W219367	KWH	05/23/12 09:53	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000096	2.5	W219367	KWH	05/23/12 09:53	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.00002	2.5	W219367	KWH	05/23/12 09:53	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.00009	2.5	W219367	KWH	05/23/12 09:53	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000072	2.5	W219367	KWH	05/23/12 09:53	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W219367	KWH	05/23/12 09:53	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.000018	2.5	W219367	KWH	05/23/12 09:53	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000009	2.5	W219367	KWH	05/23/12 09:53	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000010	2.5	W219367	KWH	05/23/12 09:53	
SM 2340B	Hardness (as CaCO3)	1.05	mg/L	0.347	0.140		N/A		05/27/12 10:32	



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2E0270**
Reported: 29-May-12 10:31

Client Sample ID: **24APR12GW001**

SVL Sample ID: **W2E0270-01 (Ground Water)**

Sample Report Page 2 of 3

Sampled: 24-Apr-12 10:48
Received: 09-May-12
Sampled By: MA

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	0.100	mg/L	0.080	0.022		W220091	AS	05/27/12 10:32	
EPA 200.7	Barium	0.0024	mg/L	0.0020	0.0006		W220091	AS	05/27/12 10:32	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.014		W220091	AS	05/27/12 10:32	
EPA 200.7	Calcium	0.300	mg/L	0.040	0.013		W220091	AS	05/27/12 10:32	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0015		W220091	AS	05/27/12 10:32	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0014		W220091	AS	05/27/12 10:32	
EPA 200.7	Iron	0.127	mg/L	0.060	0.022		W220091	AS	05/27/12 10:32	
EPA 200.7	Magnesium	0.073	mg/L	0.060	0.026		W220091	AS	05/27/12 10:32	
EPA 200.7	Manganese	0.0281	mg/L	0.0040	0.0014		W220091	AS	05/27/12 10:32	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.002		W220091	AS	05/27/12 10:32	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.004		W220091	AS	05/27/12 10:32	
EPA 200.7	Potassium	0.77	mg/L	0.50	0.16		W220091	AS	05/27/12 10:32	
EPA 200.7	Silicon	10.8	mg/L	0.08	0.03		W220091	AS	05/27/12 10:32	
EPA 200.7	Sodium	11.3	mg/L	0.50	0.14		W220091	AS	05/27/12 10:32	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0004		W220091	AS	05/27/12 10:32	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0007		W220091	AS	05/27/12 10:32	
EPA 200.7	Zinc	0.0239	mg/L	0.0100	0.0026		W220091	AS	05/27/12 10:32	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W219369	KWH	05/22/12 11:01	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W219369	KWH	05/22/12 11:01	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000077		W219369	KWH	05/22/12 11:01	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.000014		W219369	KWH	05/22/12 11:01	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.000072		W219369	KWH	05/22/12 11:01	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000058		W219369	KWH	05/22/12 11:01	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W219369	KWH	05/22/12 11:01	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.0000074		W219369	KWH	05/22/12 11:01	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000075		W219369	KWH	05/22/12 11:01	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000082		W219369	KWH	05/22/12 11:01	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000054		W220514	DJA	05/21/12 13:38	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0005		W219387	IIT	05/11/12 10:13	H3
EPA 120.1	Specific conductance	57.8	µmhos/cm	5.00			W219371	RS	05/11/12 15:30	
EPA 180.1	Turbidity	1.49	NTU	0.100			W219417	SM	05/11/12 10:20	H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W219383	IIT	05/11/12 11:44	H3
EPA 350.1	Ammonia as N	0.050	mg/L	0.030	0.006		W220246	RHW	05/21/12 12:32	
EPA 353.2	Nitrate/Nitrite as N	0.224	mg/L	0.050	0.008		W220154	DKG	05/19/12 13:05	
SM 2320B/2310B	Bicarbonate	13.7	mg/L	1.0	0.1		W219386	DKS	05/11/12 09:18	H3
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.1		W219386	DKS	05/11/12 09:18	H3
SM 2320B/2310B	Total Alkalinity	13.7	mg/L	1.0	0.1		W219386	DKS	05/11/12 09:18	H3
SM 2540 C	Total Diss. Solids	61	mg/L	10			W219373	RS	05/14/12 09:00	H3
SM 2540 D	Total Susp. Solids	< 5.0	mg/L	5.0			W219372	RS	05/14/12 09:00	H3
SM 4500 H B	pH @18.0°C	6.10	pH Units				W219386	DKS	05/11/12 09:18	H3,H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W219385	IIT	05/11/12 12:18	H3
SM 4500-P-E	Phosphorus	< 0.010	mg/L	0.010	0.005		W220149	CCM/S	05/15/12 13:46	



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

(208) 784-1258

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Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: **W2E0270**

Reported: 29-May-12 10:31

Client Sample ID: **24APR12GW001**

SVL Sample ID: **W2E0270-01 (Ground Water)**

Sample Report Page 3 of 3

Sampled: 24-Apr-12 10:48

Received: 09-May-12

Sampled By: MA

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	3.75	mg/L	0.20	0.03		W221064	AEW	05/21/12 23:55	
EPA 300.0	Fluoride	< 0.10	mg/L	0.10	0.02		W221064	AEW	05/21/12 23:55	
EPA 300.0	Sulfate as SO4	6.18	mg/L	0.30	0.05		W221064	AEW	05/21/12 23:55	

Cation/Anion Balance and TDS Ratios

Cation Sum: 0.55 meq/L Anion Sum: 0.53 meq/L C/A Balance: 2.57 % Calculated TDS: 62 TDS/cTDS: 0.99 TDS/eC: 1.06

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Brandon Borgias
Systems Manager



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2E0270**
Reported: 29-May-12 10:31

Client Sample ID: **24APR12GW002**

SVL Sample ID: **W2E0270-02 (Ground Water)**

Sample Report Page 1 of 3

Sampled: 24-Apr-12 11:49
Received: 09-May-12
Sampled By: MA

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000054		W220516	DJA	05/21/12 15:20	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.011		W220081	AS	05/26/12 09:37	
EPA 200.7	Barium	0.0090	mg/L	0.0020	0.0003		W220081	AS	05/26/12 09:37	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.007		W220081	AS	05/26/12 09:37	
EPA 200.7	Calcium	0.919	mg/L	0.040	0.006		W220081	AS	05/26/12 09:37	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0008		W220081	AS	05/26/12 09:37	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0007		W220081	AS	05/26/12 09:37	
EPA 200.7	Iron	< 0.060	mg/L	0.060	0.011		W220081	AS	05/26/12 09:37	
EPA 200.7	Magnesium	2.08	mg/L	0.060	0.013		W220081	AS	05/26/12 09:37	
EPA 200.7	Manganese	0.0336	mg/L	0.0040	0.0007		W220081	AS	05/26/12 09:37	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W220081	AS	05/26/12 09:37	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W220081	AS	05/26/12 09:37	
EPA 200.7	Potassium	< 0.50	mg/L	0.50	0.08		W220081	AS	05/26/12 09:37	
EPA 200.7	Silicon	8.65	mg/L	0.08	0.01		W220081	AS	05/26/12 09:37	
EPA 200.7	Sodium	3.70	mg/L	0.50	0.07		W220081	AS	05/26/12 09:37	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0002		W220081	AS	05/26/12 09:37	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0004		W220081	AS	05/26/12 09:37	
EPA 200.7	Zinc	0.0456	mg/L	0.0100	0.0013		W220081	AS	05/26/12 09:37	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W219367	KWH	05/23/12 10:07	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W219367	KWH	05/23/12 10:07	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000096	2.5	W219367	KWH	05/23/12 10:07	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.00002	2.5	W219367	KWH	05/23/12 10:07	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.00009	2.5	W219367	KWH	05/23/12 10:07	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000072	2.5	W219367	KWH	05/23/12 10:07	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W219367	KWH	05/23/12 10:07	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.000018	2.5	W219367	KWH	05/23/12 10:07	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000009	2.5	W219367	KWH	05/23/12 10:07	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000010	2.5	W219367	KWH	05/23/12 10:07	
SM 2340B	Hardness (as CaCO3)	10.8	mg/L	0.347	0.140		N/A		05/27/12 10:54	



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: **Suriname Merian 2012 / 113-93245**

Work Order: **W2E0270**

Reported: 29-May-12 10:31

Client Sample ID: **24APR12GW002**

Sampled: 24-Apr-12 11:49

SVL Sample ID: **W2E0270-02 (Ground Water)**

Received: 09-May-12

Sample Report Page 2 of 3

Sampled By: MA

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.022		W220091	AS	05/27/12 10:54	
EPA 200.7	Barium	0.0085	mg/L	0.0020	0.0006		W220091	AS	05/27/12 10:54	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.014		W220091	AS	05/27/12 10:54	
EPA 200.7	Calcium	0.939	mg/L	0.040	0.013		W220091	AS	05/27/12 10:54	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0015		W220091	AS	05/27/12 10:54	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0014		W220091	AS	05/27/12 10:54	
EPA 200.7	Iron	< 0.060	mg/L	0.060	0.022		W220091	AS	05/27/12 10:54	
EPA 200.7	Magnesium	2.05	mg/L	0.060	0.026		W220091	AS	05/27/12 10:54	
EPA 200.7	Manganese	0.0341	mg/L	0.0040	0.0014		W220091	AS	05/27/12 10:54	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.002		W220091	AS	05/27/12 10:54	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.004		W220091	AS	05/27/12 10:54	
EPA 200.7	Potassium	< 0.50	mg/L	0.50	0.16		W220091	AS	05/27/12 10:54	
EPA 200.7	Silicon	8.46	mg/L	0.08	0.03		W220091	AS	05/27/12 10:54	
EPA 200.7	Sodium	3.83	mg/L	0.50	0.14		W220091	AS	05/27/12 10:54	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0004		W220091	AS	05/27/12 10:54	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0007		W220091	AS	05/27/12 10:54	
EPA 200.7	Zinc	0.0439	mg/L	0.0100	0.0026		W220091	AS	05/27/12 10:54	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W219369	KWH	05/22/12 11:14	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W219369	KWH	05/22/12 11:14	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000077		W219369	KWH	05/22/12 11:14	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.000014		W219369	KWH	05/22/12 11:14	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.000072		W219369	KWH	05/22/12 11:14	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000058		W219369	KWH	05/22/12 11:14	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W219369	KWH	05/22/12 11:14	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.0000074		W219369	KWH	05/22/12 11:14	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000075		W219369	KWH	05/22/12 11:14	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000082		W219369	KWH	05/22/12 11:14	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000054		W220514	DJA	05/21/12 13:40	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0005		W219387	IIT	05/11/12 10:15	H3
EPA 120.1	Specific conductance	41.0	µmhos/cm	5.00			W219371	RS	05/11/12 15:30	
EPA 180.1	Turbidity	0.224	NTU	0.100			W219417	SM	05/11/12 10:20	H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W219383	IIT	05/11/12 11:46	H3
EPA 350.1	Ammonia as N	< 0.030	mg/L	0.030	0.006		W220246	RHW	05/21/12 12:34	
EPA 353.2	Nitrate/Nitrite as N	0.116	mg/L	0.050	0.008		W220154	DKG	05/19/12 13:06	
SM 2320B/2310B	Bicarbonate	12.3	mg/L	1.0	0.1		W219386	DKS	05/11/12 09:25	H3
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.1		W219386	DKS	05/11/12 09:25	H3
SM 2320B/2310B	Total Alkalinity	12.3	mg/L	1.0	0.1		W219386	DKS	05/11/12 09:25	H3
SM 2540 C	Total Diss. Solids	34	mg/L	10			W219373	RS	05/14/12 09:00	H3
SM 2540 D	Total Susp. Solids	< 5.0	mg/L	5.0			W219372	RS	05/14/12 09:00	H3
SM 4500 H B	pH @18.0°C	5.99	pH Units				W219386	DKS	05/11/12 09:25	H3,H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W219385	IIT	05/11/12 12:20	H3
SM 4500-P-E	Phosphorus	< 0.010	mg/L	0.010	0.005		W220149	CCM/S	05/15/12 13:46	



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Kellogg ID 83837-0929

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Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: **W2E0270**

Reported: 29-May-12 10:31

Client Sample ID: **24APR12GW002**

SVL Sample ID: **W2E0270-02 (Ground Water)**

Sample Report Page 3 of 3

Sampled: 24-Apr-12 11:49

Received: 09-May-12

Sampled By: MA

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	4.14	mg/L	0.20	0.03		W221064	AEW	05/22/12 00:30	
EPA 300.0	Fluoride	< 0.10	mg/L	0.10	0.02		W221064	AEW	05/22/12 00:30	
EPA 300.0	Sulfate as SO4	0.87	mg/L	0.30	0.05		W221064	AEW	05/22/12 00:30	

Cation/Anion Balance and TDS Ratios

Cation Sum: 0.38 meq/L Anion Sum: 0.39 meq/L C/A Balance: -1.03 % Calculated TDS: 43 TDS/cTDS: 0.79 TDS/eC: 0.83

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Brandon Borgias
Systems Manager



Tetra Tech EM, Inc. (Boise)
 3380 Americana Terrace, Suite 201
 Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
 Work Order: **W2E0270**
 Reported: 29-May-12 10:31

Client Sample ID: **24APR12GW102**

SVL Sample ID: **W2E0270-03 (Ground Water)**

Sample Report Page 1 of 3

Sampled: 24-Apr-12 11:49
 Received: 09-May-12
 Sampled By: MA

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000054		W220516	DJA	05/21/12 15:22	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.011		W220081	AS	05/26/12 09:43	
EPA 200.7	Barium	0.0091	mg/L	0.0020	0.0003		W220081	AS	05/26/12 09:43	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.007		W220081	AS	05/26/12 09:43	
EPA 200.7	Calcium	0.942	mg/L	0.040	0.006		W220081	AS	05/26/12 09:43	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0008		W220081	AS	05/26/12 09:43	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0007		W220081	AS	05/26/12 09:43	
EPA 200.7	Iron	< 0.060	mg/L	0.060	0.011		W220081	AS	05/26/12 09:43	
EPA 200.7	Magnesium	2.13	mg/L	0.060	0.013		W220081	AS	05/26/12 09:43	
EPA 200.7	Manganese	0.0341	mg/L	0.0040	0.0007		W220081	AS	05/26/12 09:43	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W220081	AS	05/26/12 09:43	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W220081	AS	05/26/12 09:43	
EPA 200.7	Potassium	< 0.50	mg/L	0.50	0.08		W220081	AS	05/26/12 09:43	
EPA 200.7	Silicon	8.95	mg/L	0.08	0.01		W220081	AS	05/26/12 09:43	
EPA 200.7	Sodium	3.79	mg/L	0.50	0.07		W220081	AS	05/26/12 09:43	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0002		W220081	AS	05/26/12 09:43	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0004		W220081	AS	05/26/12 09:43	
EPA 200.7	Zinc	0.0463	mg/L	0.0100	0.0013		W220081	AS	05/26/12 09:43	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W219367	KWH	05/23/12 10:11	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W219367	KWH	05/23/12 10:11	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000096	2.5	W219367	KWH	05/23/12 10:11	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.00002	2.5	W219367	KWH	05/23/12 10:11	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.00009	2.5	W219367	KWH	05/23/12 10:11	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000072	2.5	W219367	KWH	05/23/12 10:11	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W219367	KWH	05/23/12 10:11	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.000018	2.5	W219367	KWH	05/23/12 10:11	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000009	2.5	W219367	KWH	05/23/12 10:11	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000010	2.5	W219367	KWH	05/23/12 10:11	
SM 2340B	Hardness (as CaCO3)	11.0	mg/L	0.347	0.140		N/A		05/27/12 10:59	



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2E0270**
Reported: 29-May-12 10:31

Client Sample ID: **24APR12GW102**

SVL Sample ID: **W2E0270-03 (Ground Water)**

Sample Report Page 2 of 3

Sampled: 24-Apr-12 11:49
Received: 09-May-12
Sampled By: MA

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.022		W220091	AS	05/27/12 10:59	
EPA 200.7	Barium	0.0086	mg/L	0.0020	0.0006		W220091	AS	05/27/12 10:59	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.014		W220091	AS	05/27/12 10:59	
EPA 200.7	Calcium	0.913	mg/L	0.040	0.013		W220091	AS	05/27/12 10:59	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0015		W220091	AS	05/27/12 10:59	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0014		W220091	AS	05/27/12 10:59	
EPA 200.7	Iron	< 0.060	mg/L	0.060	0.022		W220091	AS	05/27/12 10:59	
EPA 200.7	Magnesium	2.11	mg/L	0.060	0.026		W220091	AS	05/27/12 10:59	
EPA 200.7	Manganese	0.0335	mg/L	0.0040	0.0014		W220091	AS	05/27/12 10:59	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.002		W220091	AS	05/27/12 10:59	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.004		W220091	AS	05/27/12 10:59	
EPA 200.7	Potassium	< 0.50	mg/L	0.50	0.16		W220091	AS	05/27/12 10:59	
EPA 200.7	Silicon	8.45	mg/L	0.08	0.03		W220091	AS	05/27/12 10:59	
EPA 200.7	Sodium	3.82	mg/L	0.50	0.14		W220091	AS	05/27/12 10:59	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0004		W220091	AS	05/27/12 10:59	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0007		W220091	AS	05/27/12 10:59	
EPA 200.7	Zinc	0.0437	mg/L	0.0100	0.0026		W220091	AS	05/27/12 10:59	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W219369	KWH	05/22/12 11:19	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W219369	KWH	05/22/12 11:19	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000077		W219369	KWH	05/22/12 11:19	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.000014		W219369	KWH	05/22/12 11:19	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.000072		W219369	KWH	05/22/12 11:19	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000058		W219369	KWH	05/22/12 11:19	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W219369	KWH	05/22/12 11:19	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.0000074		W219369	KWH	05/22/12 11:19	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000075		W219369	KWH	05/22/12 11:19	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000082		W219369	KWH	05/22/12 11:19	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000054		W220514	DJA	05/21/12 13:41	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0005		W219387	IIT	05/11/12 10:17	H3
EPA 120.1	Specific conductance	40.9	µmhos/cm	5.00			W219371	RS	05/11/12 15:30	
EPA 180.1	Turbidity	0.164	NTU	0.100			W219417	SM	05/11/12 10:20	H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W219383	IIT	05/11/12 11:48	H3
EPA 350.1	Ammonia as N	< 0.030	mg/L	0.030	0.006		W220246	RHW	05/21/12 12:35	
EPA 353.2	Nitrate/Nitrite as N	0.117	mg/L	0.050	0.008		W220154	DKG	05/19/12 13:07	
SM 2320B/2310B	Bicarbonate	12.1	mg/L	1.0	0.1		W219386	DKS	05/11/12 09:32	H3
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.1		W219386	DKS	05/11/12 09:32	H3
SM 2320B/2310B	Total Alkalinity	12.1	mg/L	1.0	0.1		W219386	DKS	05/11/12 09:32	H3
SM 2540 C	Total Diss. Solids	23	mg/L	10			W219373	RS	05/14/12 09:00	H3
SM 2540 D	Total Susp. Solids	< 5.0	mg/L	5.0			W219372	RS	05/14/12 09:00	H3
SM 4500 H B	pH @18.0°C	5.88	pH Units				W219386	DKS	05/11/12 09:32	H3,H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W219385	IIT	05/11/12 12:28	H3
SM 4500-P-E	Phosphorus	< 0.010	mg/L	0.010	0.005		W220149	CCM/S	05/15/12 13:46	



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Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: **W2E0270**

Reported: 29-May-12 10:31

Client Sample ID: **24APR12GW102**

SVL Sample ID: **W2E0270-03 (Ground Water)**

Sample Report Page 3 of 3

Sampled: 24-Apr-12 11:49

Received: 09-May-12

Sampled By: MA

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	3.98	mg/L	0.20	0.03		W221064	AEW	05/22/12 00:41	
EPA 300.0	Fluoride	< 0.10	mg/L	0.10	0.02		W221064	AEW	05/22/12 00:41	
EPA 300.0	Sulfate as SO4	1.37	mg/L	0.30	0.05		W221064	AEW	05/22/12 00:41	

Cation/Anion Balance and TDS Ratios

Cation Sum: 0.39 meq/L Anion Sum: 0.39 meq/L C/A Balance: -0.18 % Calculated TDS: 44 TDS/cTDS: 0.53 TDS/eC: 0.56

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Brandon Borgias
Systems Manager



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2E0270**
Reported: 29-May-12 10:31

Client Sample ID: **24APR12GW003**

SVL Sample ID: **W2E0270-04 (Ground Water)**

Sample Report Page 1 of 3

Sampled: 24-Apr-12 15:37
Received: 09-May-12
Sampled By: MA

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000054		W220516	DJA	05/21/12 15:24	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.011		W220081	AS	05/26/12 09:48	
EPA 200.7	Barium	0.0228	mg/L	0.0020	0.0003		W220081	AS	05/26/12 09:48	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.007		W220081	AS	05/26/12 09:48	
EPA 200.7	Calcium	13.4	mg/L	0.040	0.006		W220081	AS	05/26/12 09:48	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0008		W220081	AS	05/26/12 09:48	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0007		W220081	AS	05/26/12 09:48	
EPA 200.7	Iron	2.35	mg/L	0.060	0.011		W220081	AS	05/26/12 09:48	
EPA 200.7	Magnesium	8.71	mg/L	0.060	0.013		W220081	AS	05/26/12 09:48	
EPA 200.7	Manganese	0.579	mg/L	0.0040	0.0007		W220081	AS	05/26/12 09:48	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W220081	AS	05/26/12 09:48	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W220081	AS	05/26/12 09:48	
EPA 200.7	Potassium	0.87	mg/L	0.50	0.08		W220081	AS	05/26/12 09:48	
EPA 200.7	Silicon	33.5	mg/L	0.08	0.01		W220081	AS	05/26/12 09:48	
EPA 200.7	Sodium	23.0	mg/L	0.50	0.07		W220081	AS	05/26/12 09:48	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0002		W220081	AS	05/26/12 09:48	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0004		W220081	AS	05/26/12 09:48	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0013		W220081	AS	05/26/12 09:48	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W219367	KWH	05/23/12 10:16	
EPA 200.8	Arsenic	0.0033	mg/L	0.0030	0.0003	2.5	W219367	KWH	05/23/12 10:16	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000096	2.5	W219367	KWH	05/23/12 10:16	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.00002	2.5	W219367	KWH	05/23/12 10:16	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.00009	2.5	W219367	KWH	05/23/12 10:16	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000072	2.5	W219367	KWH	05/23/12 10:16	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W219367	KWH	05/23/12 10:16	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.000018	2.5	W219367	KWH	05/23/12 10:16	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000009	2.5	W219367	KWH	05/23/12 10:16	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000010	2.5	W219367	KWH	05/23/12 10:16	
SM 2340B	Hardness (as CaCO3)	68.6	mg/L	0.347	0.140		N/A		05/27/12 11:05	



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2E0270**
Reported: 29-May-12 10:31

Client Sample ID: **24APR12GW003**

SVL Sample ID: **W2E0270-04 (Ground Water)**

Sample Report Page 2 of 3

Sampled: 24-Apr-12 15:37
Received: 09-May-12
Sampled By: MA

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.022		W220091	AS	05/27/12 11:05	
EPA 200.7	Barium	0.0221	mg/L	0.0020	0.0006		W220091	AS	05/27/12 11:05	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.014		W220091	AS	05/27/12 11:05	
EPA 200.7	Calcium	13.2	mg/L	0.040	0.013		W220091	AS	05/27/12 11:05	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0015		W220091	AS	05/27/12 11:05	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0014		W220091	AS	05/27/12 11:05	
EPA 200.7	Iron	2.30	mg/L	0.060	0.022		W220091	AS	05/27/12 11:05	
EPA 200.7	Magnesium	8.68	mg/L	0.060	0.026		W220091	AS	05/27/12 11:05	
EPA 200.7	Manganese	0.587	mg/L	0.0040	0.0014		W220091	AS	05/27/12 11:05	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.002		W220091	AS	05/27/12 11:05	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.004		W220091	AS	05/27/12 11:05	
EPA 200.7	Potassium	0.88	mg/L	0.50	0.16		W220091	AS	05/27/12 11:05	
EPA 200.7	Silicon	32.6	mg/L	0.08	0.03		W220091	AS	05/27/12 11:05	
EPA 200.7	Sodium	23.0	mg/L	0.50	0.14		W220091	AS	05/27/12 11:05	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0004		W220091	AS	05/27/12 11:05	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0007		W220091	AS	05/27/12 11:05	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0026		W220091	AS	05/27/12 11:05	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W219369	KWH	05/22/12 11:24	
EPA 200.8	Arsenic	0.0034	mg/L	0.0030	0.0002		W219369	KWH	05/22/12 11:24	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000077		W219369	KWH	05/22/12 11:24	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.000014		W219369	KWH	05/22/12 11:24	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.000072		W219369	KWH	05/22/12 11:24	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000058		W219369	KWH	05/22/12 11:24	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W219369	KWH	05/22/12 11:24	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.0000074		W219369	KWH	05/22/12 11:24	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000075		W219369	KWH	05/22/12 11:24	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000082		W219369	KWH	05/22/12 11:24	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000054		W220514	DJA	05/21/12 13:43	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0005		W219387	IIT	05/11/12 10:25	H3
EPA 120.1	Specific conductance	224	µmhos/cm	5.00			W219371	RS	05/11/12 15:30	
EPA 180.1	Turbidity	9.12	NTU	0.100			W219417	SM	05/11/12 10:20	H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W219383	IIT	05/11/12 11:50	H3
EPA 350.1	Ammonia as N	0.092	mg/L	0.030	0.006		W220246	RHW	05/21/12 12:36	
EPA 353.2	Nitrate/Nitrite as N	< 0.050	mg/L	0.050	0.008		W220154	DKG	05/19/12 13:09	
SM 2320B/2310B	Bicarbonate	107	mg/L	1.0	0.1		W219386	DKS	05/11/12 09:40	H3
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.1		W219386	DKS	05/11/12 09:40	H3
SM 2320B/2310B	Total Alkalinity	107	mg/L	1.0	0.1		W219386	DKS	05/11/12 09:40	H3
SM 2540 C	Total Diss. Solids	171	mg/L	10			W219373	RS	05/14/12 09:00	H3
SM 2540 D	Total Susp. Solids	6.0	mg/L	5.0			W219372	RS	05/14/12 09:00	H3
SM 4500 H B	pH @18.0°C	7.19	pH Units				W219386	DKS	05/11/12 09:40	H3,H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W219385	IIT	05/11/12 12:30	H3
SM 4500-P-E	Phosphorus	0.395	mg/L	0.010	0.005		W220149	CCM/S	05/15/12 13:46	



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

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Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: **W2E0270**

Reported: 29-May-12 10:31

Client Sample ID: **24APR12GW003**

SVL Sample ID: **W2E0270-04 (Ground Water)**

Sample Report Page 3 of 3

Sampled: 24-Apr-12 15:37

Received: 09-May-12

Sampled By: MA

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	9.26	mg/L	0.20	0.03		W221064	AEW	05/22/12 00:53	
EPA 300.0	Fluoride	0.19	mg/L	0.10	0.02		W221064	AEW	05/22/12 00:53	
EPA 300.0	Sulfate as SO4	1.37	mg/L	0.30	0.05		W221064	AEW	05/22/12 00:53	

Cation/Anion Balance and TDS Ratios

Cation Sum: 2.51 meq/L Anion Sum: 2.44 meq/L C/A Balance: 1.40 % Calculated TDS: 210 TDS/cTDS: 0.81 TDS/eC: 0.76

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Brandon Borgias
Systems Manager



Tetra Tech EM, Inc. (Boise)
 3380 Americana Terrace, Suite 201
 Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
 Work Order: **W2E0270**
 Reported: 29-May-12 10:31

Client Sample ID: **25APR12GW004**

SVL Sample ID: **W2E0270-05 (Ground Water)**

Sample Report Page 1 of 3

Sampled: 25-Apr-12 10:28
 Received: 09-May-12
 Sampled By: MA

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000054		W220516	DJA	05/21/12 15:25	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.011		W220081	AS	05/26/12 12:48	
EPA 200.7	Barium	0.198	mg/L	0.0020	0.0003		W220081	AS	05/26/12 12:48	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.007		W220081	AS	05/26/12 12:48	
EPA 200.7	Calcium	28.1	mg/L	0.040	0.006		W220081	AS	05/26/12 12:48	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0008		W220081	AS	05/26/12 12:48	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0007		W220081	AS	05/26/12 12:48	
EPA 200.7	Iron	1.52	mg/L	0.060	0.011		W220081	AS	05/26/12 12:48	
EPA 200.7	Magnesium	8.69	mg/L	0.060	0.013		W220081	AS	05/26/12 12:48	
EPA 200.7	Manganese	2.94	mg/L	0.0040	0.0007		W220081	AS	05/26/12 12:48	
EPA 200.7	Molybdenum	0.013	mg/L	0.008	0.001		W220081	AS	05/26/12 12:48	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W220081	AS	05/26/12 12:48	
EPA 200.7	Potassium	1.00	mg/L	0.50	0.08		W220081	AS	05/26/12 12:48	
EPA 200.7	Silicon	16.5	mg/L	0.08	0.01		W220081	AS	05/26/12 12:48	
EPA 200.7	Sodium	28.5	mg/L	0.50	0.07		W220081	AS	05/26/12 12:48	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0002		W220081	AS	05/26/12 12:48	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0004		W220081	AS	05/26/12 12:48	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0013		W220081	AS	05/26/12 12:48	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W219367	KWH	05/23/12 10:20	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W219367	KWH	05/23/12 10:20	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000096	2.5	W219367	KWH	05/23/12 10:20	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.00002	2.5	W219367	KWH	05/23/12 10:20	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.00009	2.5	W219367	KWH	05/23/12 10:20	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000072	2.5	W219367	KWH	05/23/12 10:20	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W219367	KWH	05/23/12 10:20	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.000018	2.5	W219367	KWH	05/23/12 10:20	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000009	2.5	W219367	KWH	05/23/12 10:20	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000010	2.5	W219367	KWH	05/23/12 10:20	
SM 2340B	Hardness (as CaCO3)	98.2	mg/L	0.347	0.140		N/A		05/27/12 11:10	



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2E0270**
Reported: 29-May-12 10:31

Client Sample ID: **25APR12GW004**

SVL Sample ID: **W2E0270-05 (Ground Water)**

Sample Report Page 2 of 3

Sampled: 25-Apr-12 10:28
Received: 09-May-12
Sampled By: MA

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.022		W220091	AS	05/27/12 11:10	
EPA 200.7	Barium	0.177	mg/L	0.0020	0.0006		W220091	AS	05/27/12 11:10	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.014		W220091	AS	05/27/12 11:10	
EPA 200.7	Calcium	25.7	mg/L	0.040	0.013		W220091	AS	05/27/12 11:10	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0015		W220091	AS	05/27/12 11:10	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0014		W220091	AS	05/27/12 11:10	
EPA 200.7	Iron	1.37	mg/L	0.060	0.022		W220091	AS	05/27/12 11:10	
EPA 200.7	Magnesium	8.26	mg/L	0.060	0.026		W220091	AS	05/27/12 11:10	
EPA 200.7	Manganese	2.74	mg/L	0.0040	0.0014		W220091	AS	05/27/12 11:10	
EPA 200.7	Molybdenum	0.009	mg/L	0.008	0.002		W220091	AS	05/27/12 11:10	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.004		W220091	AS	05/27/12 11:10	
EPA 200.7	Potassium	0.94	mg/L	0.50	0.16		W220091	AS	05/27/12 11:10	
EPA 200.7	Silicon	15.0	mg/L	0.08	0.03		W220091	AS	05/27/12 11:10	
EPA 200.7	Sodium	26.5	mg/L	0.50	0.14		W220091	AS	05/27/12 11:10	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0004		W220091	AS	05/27/12 11:10	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0007		W220091	AS	05/27/12 11:10	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0026		W220091	AS	05/27/12 11:10	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W219369	KWH	05/22/12 11:28	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W219369	KWH	05/22/12 11:28	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000077		W219369	KWH	05/22/12 11:28	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.000014		W219369	KWH	05/22/12 11:28	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.000072		W219369	KWH	05/22/12 11:28	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000058		W219369	KWH	05/22/12 11:28	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W219369	KWH	05/22/12 11:28	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.0000074		W219369	KWH	05/22/12 11:28	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000075		W219369	KWH	05/22/12 11:28	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000082		W219369	KWH	05/22/12 11:28	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000054		W220514	DJA	05/21/12 13:45	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0005		W219387	IIT	05/11/12 10:27	H3
EPA 120.1	Specific conductance	300	µmhos/cm	5.00			W219371	RS	05/11/12 15:30	
EPA 180.1	Turbidity	2.47	NTU	0.100			W219417	SM	05/11/12 10:20	H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W219383	IIT	05/11/12 11:52	H3
EPA 350.1	Ammonia as N	0.078	mg/L	0.030	0.006		W220246	RHW	05/21/12 12:38	
EPA 353.2	Nitrate/Nitrite as N	< 0.050	mg/L	0.050	0.008		W220154	DKG	05/19/12 13:10	
SM 2320B/2310B	Bicarbonate	159	mg/L	1.0	0.1		W219386	DKS	05/11/12 16:06	H3
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.1		W219386	DKS	05/11/12 16:06	H3
SM 2320B/2310B	Total Alkalinity	159	mg/L	1.0	0.1		W219386	DKS	05/11/12 16:06	H3
SM 2540 C	Total Diss. Solids	156	mg/L	10			W219373	RS	05/14/12 09:00	H3
SM 2540 D	Total Susp. Solids	< 5.0	mg/L	5.0			W219372	RS	05/14/12 09:00	H3
SM 4500 H B	pH @19.0°C	7.66	pH Units				W219386	DKS	05/11/12 16:06	H3,H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W219385	IIT	05/11/12 12:32	H3
SM 4500-P-E	Phosphorus	0.028	mg/L	0.010	0.005		W220149	CCM/S	05/15/12 13:46	



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Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: **W2E0270**

Reported: 29-May-12 10:31

Client Sample ID: **25APR12GW004**

SVL Sample ID: **W2E0270-05 (Ground Water)**

Sample Report Page 3 of 3

Sampled: 25-Apr-12 10:28

Received: 09-May-12

Sampled By: MA

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	6.49	mg/L	0.20	0.03		W221064	AEW	05/22/12 01:04	
EPA 300.0	Fluoride	0.13	mg/L	0.10	0.02		W221064	AEW	05/22/12 01:04	
EPA 300.0	Sulfate as SO4	< 0.30	mg/L	0.30	0.05		W221064	AEW	05/22/12 01:04	

Cation/Anion Balance and TDS Ratios

Cation Sum: 3.30 meq/L Anion Sum: 3.37 meq/L C/A Balance: -1.07 % Calculated TDS: 209 TDS/cTDS: 0.75 TDS/eC: 0.52

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Brandon Borgias
Systems Manager



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2E0270**
Reported: 29-May-12 10:31

Client Sample ID: **25APR12GW005**

SVL Sample ID: **W2E0270-06 (Ground Water)**

Sample Report Page 1 of 3

Sampled: 25-Apr-12 15:50
Received: 09-May-12
Sampled By: MA

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000054		W220516	DJA	05/21/12 15:28	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	7.75	mg/L	0.080	0.011		W220081	AS	05/26/12 10:01	
EPA 200.7	Barium	0.0474	mg/L	0.0020	0.0003		W220081	AS	05/26/12 10:01	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.007		W220081	AS	05/26/12 10:01	
EPA 200.7	Calcium	5.21	mg/L	0.040	0.006		W220081	AS	05/26/12 10:01	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0008		W220081	AS	05/26/12 10:01	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0007		W220081	AS	05/26/12 10:01	
EPA 200.7	Iron	4.34	mg/L	0.060	0.011		W220081	AS	05/26/12 10:01	
EPA 200.7	Magnesium	2.23	mg/L	0.060	0.013		W220081	AS	05/26/12 10:01	
EPA 200.7	Manganese	0.219	mg/L	0.0040	0.0007		W220081	AS	05/26/12 10:01	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W220081	AS	05/26/12 10:01	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W220081	AS	05/26/12 10:01	
EPA 200.7	Potassium	2.07	mg/L	0.50	0.08		W220081	AS	05/26/12 10:01	
EPA 200.7	Silicon	25.8	mg/L	0.08	0.01		W220081	AS	05/26/12 10:01	
EPA 200.7	Sodium	31.4	mg/L	0.50	0.07		W220081	AS	05/26/12 10:01	
EPA 200.7	Titanium	0.0110	mg/L	0.0050	0.0002		W220081	AS	05/26/12 10:01	
EPA 200.7	Vanadium	0.0050	mg/L	0.0050	0.0004		W220081	AS	05/26/12 10:01	
EPA 200.7	Zinc	0.0935	mg/L	0.0100	0.0013		W220081	AS	05/26/12 10:01	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W219367	KWH	05/23/12 10:25	
EPA 200.8	Arsenic	0.0032	mg/L	0.0030	0.0003	2.5	W219367	KWH	05/23/12 10:25	
EPA 200.8	Beryllium	0.000943	mg/L	0.000200	0.000096	2.5	W219367	KWH	05/23/12 10:25	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.00002	2.5	W219367	KWH	05/23/12 10:25	
EPA 200.8	Copper	0.00411	mg/L	0.00100	0.00009	2.5	W219367	KWH	05/23/12 10:25	
EPA 200.8	Lead	0.00637	mg/L	0.00300	0.000072	2.5	W219367	KWH	05/23/12 10:25	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W219367	KWH	05/23/12 10:25	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.000018	2.5	W219367	KWH	05/23/12 10:25	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000009	2.5	W219367	KWH	05/23/12 10:25	
EPA 200.8	Uranium	0.00215	mg/L	0.00100	0.000010	2.5	W219367	KWH	05/23/12 10:25	
SM 2340B	Hardness (as CaCO3)	5.14	mg/L	0.347	0.140		N/A		05/27/12 11:26	



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2E0270**
Reported: 29-May-12 10:31

Client Sample ID: **25APR12GW005**

SVL Sample ID: **W2E0270-06 (Ground Water)**

Sample Report Page 2 of 3

Sampled: 25-Apr-12 15:50
Received: 09-May-12
Sampled By: MA

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	0.086	mg/L	0.080	0.022		W220091	AS	05/27/12 11:26	
EPA 200.7	Barium	0.0076	mg/L	0.0020	0.0006		W220091	AS	05/27/12 11:26	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.014		W220091	AS	05/27/12 11:26	
EPA 200.7	Calcium	1.58	mg/L	0.040	0.013		W220091	AS	05/27/12 11:26	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0015		W220091	AS	05/27/12 11:26	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0014		W220091	AS	05/27/12 11:26	
EPA 200.7	Iron	0.423	mg/L	0.060	0.022		W220091	AS	05/27/12 11:26	
EPA 200.7	Magnesium	0.290	mg/L	0.060	0.026		W220091	AS	05/27/12 11:26	
EPA 200.7	Manganese	0.0667	mg/L	0.0040	0.0014		W220091	AS	05/27/12 11:26	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.002		W220091	AS	05/27/12 11:26	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.004		W220091	AS	05/27/12 11:26	
EPA 200.7	Potassium	1.29	mg/L	0.50	0.16		W220091	AS	05/27/12 11:26	
EPA 200.7	Silicon	7.71	mg/L	0.08	0.03		W220091	AS	05/27/12 11:26	
EPA 200.7	Sodium	28.3	mg/L	0.50	0.14		W220091	AS	05/27/12 11:26	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0004		W220091	AS	05/27/12 11:26	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0007		W220091	AS	05/27/12 11:26	
EPA 200.7	Zinc	0.0220	mg/L	0.0100	0.0026		W220091	AS	05/27/12 11:26	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W219369	KWH	05/22/12 11:33	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W219369	KWH	05/22/12 11:33	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000077		W219369	KWH	05/22/12 11:33	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.000014		W219369	KWH	05/22/12 11:33	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.000072		W219369	KWH	05/22/12 11:33	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000058		W219369	KWH	05/22/12 11:33	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W219369	KWH	05/22/12 11:33	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.0000074		W219369	KWH	05/22/12 11:33	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000075		W219369	KWH	05/22/12 11:33	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000082		W219369	KWH	05/22/12 11:33	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000054		W220514	DJA	05/21/12 13:46	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0005		W219387	IIT	05/11/12 10:29	H3
EPA 120.1	Specific conductance	141	µmhos/cm	5.00			W219371	RS	05/11/12 15:30	
EPA 180.1	Turbidity	89.1	NTU	0.300		3	W219417	SM	05/11/12 10:20	D2,H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W219383	IIT	05/11/12 11:54	H3
EPA 350.1	Ammonia as N	0.502	mg/L	0.030	0.006		W220246	RHW	05/21/12 12:39	
EPA 353.2	Nitrate/Nitrite as N	< 0.050	mg/L	0.050	0.008		W220154	DKG	05/19/12 13:12	
SM 2320B/2310B	Bicarbonate	56.0	mg/L	1.0	0.1		W219386	DKS	05/11/12 16:13	H3
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.1		W219386	DKS	05/11/12 16:13	H3
SM 2320B/2310B	Total Alkalinity	56.0	mg/L	1.0	0.1		W219386	DKS	05/11/12 16:13	H3
SM 2540 C	Total Diss. Solids	72	mg/L	40			W219373	RS	05/14/12 09:00	H3,N3a
SM 2540 D	Total Susp. Solids	264	mg/L	20.0			W219372	RS	05/14/12 09:00	H3,N3
SM 4500 H B	pH @19.0°C	6.89	pH Units				W219386	DKS	05/11/12 16:13	H3,H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W219385	IIT	05/11/12 12:34	H3
SM 4500-P-E	Phosphorus	0.046	mg/L	0.010	0.005		W220149	CCM/S	05/15/12 13:46	



One Government Gulch - PO Box 929

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Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: **W2E0270**

Reported: 29-May-12 10:31

Client Sample ID: **25APR12GW005**

SVL Sample ID: **W2E0270-06 (Ground Water)**

Sample Report Page 3 of 3

Sampled: 25-Apr-12 15:50

Received: 09-May-12

Sampled By: MA

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	4.92	mg/L	0.20	0.03		W221064	AEW	05/22/12 01:16	
EPA 300.0	Fluoride	0.10	mg/L	0.10	0.02		W221064	AEW	05/22/12 01:16	
EPA 300.0	Sulfate as SO4	9.23	mg/L	0.30	0.05		W221064	AEW	05/22/12 01:16	

Cation/Anion Balance and TDS Ratios

Cation Sum: 1.43 meq/L Anion Sum: 1.46 meq/L C/A Balance: -0.88 % Calculated TDS: 129 TDS/cTDS: 0.56 TDS/eC: 0.51

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Brandon Borgias
Systems Manager



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2E0270**
Reported: 29-May-12 10:31

Client Sample ID: **26APR12GW006**

SVL Sample ID: **W2E0270-07 (Ground Water)**

Sample Report Page 1 of 3

Sampled: 26-Apr-12 15:32
Received: 09-May-12
Sampled By: MA

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000054		W220516	DJA	05/21/12 15:30	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.011		W220081	AS	05/26/12 10:07	
EPA 200.7	Barium	0.0372	mg/L	0.0020	0.0003		W220081	AS	05/26/12 10:07	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.007		W220081	AS	05/26/12 10:07	
EPA 200.7	Calcium	37.5	mg/L	0.040	0.006		W220081	AS	05/26/12 10:07	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0008		W220081	AS	05/26/12 10:07	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0007		W220081	AS	05/26/12 10:07	
EPA 200.7	Iron	0.562	mg/L	0.060	0.011		W220081	AS	05/26/12 10:07	
EPA 200.7	Magnesium	15.4	mg/L	0.060	0.013		W220081	AS	05/26/12 10:07	
EPA 200.7	Manganese	0.940	mg/L	0.0040	0.0007		W220081	AS	05/26/12 10:07	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W220081	AS	05/26/12 10:07	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W220081	AS	05/26/12 10:07	
EPA 200.7	Potassium	2.60	mg/L	0.50	0.08		W220081	AS	05/26/12 10:07	
EPA 200.7	Silicon	19.7	mg/L	0.08	0.01		W220081	AS	05/26/12 10:07	
EPA 200.7	Sodium	38.9	mg/L	0.50	0.07		W220081	AS	05/26/12 10:07	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0002		W220081	AS	05/26/12 10:07	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0004		W220081	AS	05/26/12 10:07	
EPA 200.7	Zinc	0.0296	mg/L	0.0100	0.0013		W220081	AS	05/26/12 10:07	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W219367	KWH	05/23/12 10:38	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W219367	KWH	05/23/12 10:38	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000096	2.5	W219367	KWH	05/23/12 10:38	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.00002	2.5	W219367	KWH	05/23/12 10:38	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.00009	2.5	W219367	KWH	05/23/12 10:38	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000072	2.5	W219367	KWH	05/23/12 10:38	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W219367	KWH	05/23/12 10:38	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.000018	2.5	W219367	KWH	05/23/12 10:38	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000009	2.5	W219367	KWH	05/23/12 10:38	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000010	2.5	W219367	KWH	05/23/12 10:38	
SM 2340B	Hardness (as CaCO3)	148	mg/L	0.347	0.140		N/A		05/27/12 11:31	



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2E0270**
Reported: 29-May-12 10:31

Client Sample ID: **26APR12GW006**

SVL Sample ID: **W2E0270-07 (Ground Water)**

Sample Report Page 2 of 3

Sampled: 26-Apr-12 15:32
Received: 09-May-12
Sampled By: MA

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.022		W220091	AS	05/27/12 11:31	
EPA 200.7	Barium	0.0352	mg/L	0.0020	0.0006		W220091	AS	05/27/12 11:31	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.014		W220091	AS	05/27/12 11:31	
EPA 200.7	Calcium	35.3	mg/L	0.040	0.013		W220091	AS	05/27/12 11:31	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0015		W220091	AS	05/27/12 11:31	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0014		W220091	AS	05/27/12 11:31	
EPA 200.7	Iron	0.492	mg/L	0.060	0.022		W220091	AS	05/27/12 11:31	
EPA 200.7	Magnesium	14.4	mg/L	0.060	0.026		W220091	AS	05/27/12 11:31	
EPA 200.7	Manganese	0.906	mg/L	0.0040	0.0014		W220091	AS	05/27/12 11:31	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.002		W220091	AS	05/27/12 11:31	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.004		W220091	AS	05/27/12 11:31	
EPA 200.7	Potassium	2.46	mg/L	0.50	0.16		W220091	AS	05/27/12 11:31	
EPA 200.7	Silicon	18.3	mg/L	0.08	0.03		W220091	AS	05/27/12 11:31	
EPA 200.7	Sodium	37.9	mg/L	0.50	0.14		W220091	AS	05/27/12 11:31	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0004		W220091	AS	05/27/12 11:31	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0007		W220091	AS	05/27/12 11:31	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0026		W220091	AS	05/27/12 11:31	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W219369	KWH	05/22/12 11:46	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W219369	KWH	05/22/12 11:46	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000077		W219369	KWH	05/22/12 11:46	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.000014		W219369	KWH	05/22/12 11:46	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.000072		W219369	KWH	05/22/12 11:46	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000058		W219369	KWH	05/22/12 11:46	
EPA 200.8	Selenium	0.00498	mg/L	0.00300	0.00022		W219369	KWH	05/22/12 11:46	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.0000074		W219369	DT	05/25/12 09:22	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000075		W219369	KWH	05/22/12 11:46	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000082		W219369	KWH	05/22/12 11:46	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000054		W220514	DJA	05/21/12 13:50	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0005		W220034	IIT	05/14/12 15:57	H1,N3b
EPA 120.1	Specific conductance	416	µmhos/cm	5.00			W219371	RS	05/11/12 15:30	
EPA 180.1	Turbidity	1.28	NTU	0.100			W219417	SM	05/11/12 10:20	H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W219383	IIT	05/11/12 12:02	H3
EPA 350.1	Ammonia as N	0.306	mg/L	0.030	0.006		W220246	RHW	05/21/12 12:40	
EPA 353.2	Nitrate/Nitrite as N	< 0.050	mg/L	0.050	0.008		W220154	DKG	05/19/12 13:13	
SM 2320B/2310B	Bicarbonate	220	mg/L	1.0	0.1		W219386	DKS	05/11/12 16:19	H3
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.1		W219386	DKS	05/11/12 16:19	H3
SM 2320B/2310B	Total Alkalinity	220	mg/L	1.0	0.1		W219386	DKS	05/11/12 16:19	H3
SM 2540 C	Total Diss. Solids	223	mg/L	10			W219373	RS	05/14/12 09:00	H3
SM 2540 D	Total Susp. Solids	< 5.0	mg/L	5.0			W219372	RS	05/14/12 09:00	H3
SM 4500 H B	pH @19.0°C	8.09	pH Units				W219386	DKS	05/11/12 16:19	H3,H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W219385	IIT	05/11/12 12:36	H3
SM 4500-P-E	Phosphorus	0.150	mg/L	0.010	0.005		W220149	CCM/S	05/15/12 13:46	



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Kellogg ID 83837-0929

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Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: **W2E0270**

Reported: 29-May-12 10:31

Client Sample ID: **26APR12GW006**

SVL Sample ID: **W2E0270-07 (Ground Water)**

Sample Report Page 3 of 3

Sampled: 26-Apr-12 15:32

Received: 09-May-12

Sampled By: MA

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	8.95	mg/L	0.20	0.03		W221064	AEW	05/21/12 22:00	
EPA 300.0	Fluoride	0.22	mg/L	0.10	0.02		W221064	AEW	05/21/12 22:00	
EPA 300.0	Sulfate as SO4	5.33	mg/L	0.30	0.05		W221064	AEW	05/21/12 22:00	

Cation/Anion Balance and TDS Ratios

Cation Sum: 4.73 meq/L Anion Sum: 4.77 meq/L C/A Balance: -0.41 % Calculated TDS: 290 TDS/cTDS: 0.77 TDS/eC: 0.54

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Brandon Borgias
Systems Manager



Tetra Tech EM, Inc. (Boise)
 3380 Americana Terrace, Suite 201
 Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
 Work Order: **W2E0270**
 Reported: 29-May-12 10:31

Client Sample ID: **27APR12GW007**

SVL Sample ID: **W2E0270-08 (Ground Water)**

Sample Report Page 1 of 3

Sampled: 27-Apr-12 10:20
 Received: 09-May-12
 Sampled By: MA

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000054		W220516	DJA	05/21/12 15:32	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	11.7	mg/L	0.080	0.011		W220081	AS	05/26/12 12:36	
EPA 200.7	Barium	0.0549	mg/L	0.0020	0.0003		W220081	AS	05/26/12 12:36	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.007		W220081	AS	05/26/12 12:36	
EPA 200.7	Calcium	6.00	mg/L	0.040	0.006		W220081	AS	05/26/12 12:36	
EPA 200.7	Chromium	0.0375	mg/L	0.0060	0.0008		W220081	AS	05/26/12 12:36	
EPA 200.7	Cobalt	0.0102	mg/L	0.0060	0.0007		W220081	AS	05/26/12 12:36	
EPA 200.7	Iron	19.4	mg/L	0.060	0.011		W220081	AS	05/26/12 12:36	
EPA 200.7	Magnesium	14.7	mg/L	0.060	0.013		W220081	AS	05/26/12 12:36	
EPA 200.7	Manganese	0.406	mg/L	0.0040	0.0007		W220081	AS	05/26/12 12:36	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W220081	AS	05/26/12 12:36	
EPA 200.7	Nickel	0.038	mg/L	0.010	0.002		W220081	AS	05/26/12 12:36	
EPA 200.7	Potassium	1.50	mg/L	0.50	0.08		W220081	AS	05/26/12 12:36	
EPA 200.7	Silicon	42.6	mg/L	0.08	0.01		W220081	AS	05/26/12 12:36	
EPA 200.7	Sodium	22.6	mg/L	0.50	0.07		W220081	AS	05/26/12 12:36	
EPA 200.7	Titanium	0.0167	mg/L	0.0050	0.0002		W220081	AS	05/26/12 12:36	
EPA 200.7	Vanadium	0.0133	mg/L	0.0050	0.0004		W220081	AS	05/26/12 12:36	
EPA 200.7	Zinc	0.119	mg/L	0.0100	0.0013		W220081	AS	05/26/12 12:36	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W219367	KWH	05/23/12 10:43	
EPA 200.8	Arsenic	0.0038	mg/L	0.0030	0.0003	2.5	W219367	KWH	05/23/12 10:43	
EPA 200.8	Beryllium	0.000466	mg/L	0.000200	0.000096	2.5	W219367	KWH	05/23/12 10:43	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.00002	2.5	W219367	KWH	05/23/12 10:43	
EPA 200.8	Copper	0.0191	mg/L	0.00100	0.00009	2.5	W219367	KWH	05/23/12 10:43	
EPA 200.8	Lead	0.0149	mg/L	0.00300	0.000072	2.5	W219367	KWH	05/23/12 10:43	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W219367	KWH	05/23/12 10:43	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.000018	2.5	W219367	KWH	05/23/12 10:43	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000009	2.5	W219367	KWH	05/23/12 10:43	
EPA 200.8	Uranium	0.00316	mg/L	0.00100	0.000010	2.5	W219367	KWH	05/23/12 10:43	
SM 2340B	Hardness (as CaCO3)	41.0	mg/L	0.347	0.140		N/A		05/27/12 11:37	



Tetra Tech EM, Inc. (Boise)
 3380 Americana Terrace, Suite 201
 Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
 Work Order: **W2E0270**
 Reported: 29-May-12 10:31

Client Sample ID: **27APR12GW007**

SVL Sample ID: **W2E0270-08 (Ground Water)**

Sample Report Page 2 of 3

Sampled: 27-Apr-12 10:20
 Received: 09-May-12
 Sampled By: MA

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Dissolved)

EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.022		W220091	AS	05/27/12 11:37	
EPA 200.7	Barium	0.0143	mg/L	0.0020	0.0006		W220091	AS	05/27/12 11:37	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.014		W220091	AS	05/27/12 11:37	
EPA 200.7	Calcium	4.24	mg/L	0.040	0.013		W220091	AS	05/27/12 11:37	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0015		W220091	AS	05/27/12 11:37	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0014		W220091	AS	05/27/12 11:37	
EPA 200.7	Iron	0.869	mg/L	0.060	0.022		W220091	AS	05/27/12 11:37	
EPA 200.7	Magnesium	7.39	mg/L	0.060	0.026		W220091	AS	05/27/12 11:37	
EPA 200.7	Manganese	0.157	mg/L	0.0040	0.0014		W220091	AS	05/27/12 11:37	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.002		W220091	AS	05/27/12 11:37	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.004		W220091	AS	05/27/12 11:37	
EPA 200.7	Potassium	1.18	mg/L	0.50	0.16		W220091	AS	05/27/12 11:37	
EPA 200.7	Silicon	23.3	mg/L	0.08	0.03		W220091	AS	05/27/12 11:37	
EPA 200.7	Sodium	22.3	mg/L	0.50	0.14		W220091	AS	05/27/12 11:37	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0004		W220091	AS	05/27/12 11:37	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0007		W220091	AS	05/27/12 11:37	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0026		W220091	AS	05/27/12 11:37	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W219369	KWH	05/22/12 11:51	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W219369	KWH	05/22/12 11:51	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000077		W219369	KWH	05/22/12 11:51	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.000014		W219369	KWH	05/22/12 11:51	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.000072		W219369	KWH	05/22/12 11:51	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000058		W219369	KWH	05/22/12 11:51	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W219369	KWH	05/22/12 11:51	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.0000074		W219369	DT	05/25/12 09:23	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000075		W219369	KWH	05/22/12 11:51	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000082		W219369	KWH	05/22/12 11:51	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000054		W220514	DJA	05/21/12 13:51	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0005		W219387	IIT	05/11/12 10:33	
EPA 120.1	Specific conductance	169	µmhos/cm	5.00			W219371	RS	05/11/12 15:30	
EPA 180.1	Turbidity	202	NTU	1.00		10	W219417	SM	05/11/12 10:20	D2,H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W219383	IIT	05/11/12 12:04	
EPA 350.1	Ammonia as N	0.150	mg/L	0.030	0.006		W220246	RHW	05/21/12 12:47	
EPA 353.2	Nitrate/Nitrite as N	< 0.050	mg/L	0.050	0.008		W220154	DKG	05/19/12 13:15	
SM 2320B/2310B	Bicarbonate	70.3	mg/L	1.0	0.1		W219386	DKS	05/11/12 16:27	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.1		W219386	DKS	05/11/12 16:27	
SM 2320B/2310B	Total Alkalinity	70.3	mg/L	1.0	0.1		W219386	DKS	05/11/12 16:27	
SM 2540 C	Total Diss. Solids	94	mg/L	10			W219373	RS	05/14/12 09:00	H3
SM 2540 D	Total Susp. Solids	714	mg/L	5.0			W219372	RS	05/14/12 09:00	H3
SM 4500 H B	pH @18.0°C	7.30	pH Units				W219386	DKS	05/11/12 16:27	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W219385	IIT	05/11/12 12:38	
SM 4500-P-E	Phosphorus	0.293	mg/L	0.010	0.005		W220149	CCM/S	05/15/12 13:46	



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Kellogg ID 83837-0929

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Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: **W2E0270**

Reported: 29-May-12 10:31

Client Sample ID: **27APR12GW007**

SVL Sample ID: **W2E0270-08 (Ground Water)**

Sample Report Page 3 of 3

Sampled: 27-Apr-12 10:20

Received: 09-May-12

Sampled By: MA

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	7.27	mg/L	0.20	0.03		W221064	AEW	05/21/12 22:11	
EPA 300.0	Fluoride	0.14	mg/L	0.10	0.02		W221064	AEW	05/21/12 22:11	
EPA 300.0	Sulfate as SO4	9.36	mg/L	0.30	0.05		W221064	AEW	05/21/12 22:11	

Cation/Anion Balance and TDS Ratios

Cation Sum: 1.87 meq/L Anion Sum: 1.81 meq/L C/A Balance: 1.57 % Calculated TDS: 188 TDS/cTDS: 0.50 TDS/eC: 0.56

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Brandon Borgias
Systems Manager



Tetra Tech EM, Inc. (Boise)
 3380 Americana Terrace, Suite 201
 Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
 Work Order: **W2E0270**
 Reported: 29-May-12 10:31

Client Sample ID: **27APR12GW008**

SVL Sample ID: **W2E0270-09 (Ground Water)**

Sample Report Page 1 of 3

Sampled: 27-Apr-12 15:31
 Received: 09-May-12
 Sampled By: MA

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000054		W220516	DJA	05/21/12 15:37	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.011		W220081	AS	05/26/12 10:38	
EPA 200.7	Barium	0.164	mg/L	0.0020	0.0003		W220081	AS	05/26/12 10:38	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.007		W220081	AS	05/26/12 10:38	
EPA 200.7	Calcium	44.4	mg/L	0.040	0.006		W220081	AS	05/26/12 10:38	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0008		W220081	AS	05/26/12 10:38	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0007		W220081	AS	05/26/12 10:38	
EPA 200.7	Iron	0.869	mg/L	0.060	0.011		W220081	AS	05/26/12 10:38	
EPA 200.7	Magnesium	19.9	mg/L	0.060	0.013		W220081	AS	05/26/12 10:38	
EPA 200.7	Manganese	1.06	mg/L	0.0040	0.0007		W220081	AS	05/26/12 10:38	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W220081	AS	05/26/12 10:38	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W220081	AS	05/26/12 10:38	
EPA 200.7	Potassium	0.83	mg/L	0.50	0.08		W220081	AS	05/26/12 10:38	
EPA 200.7	Silicon	23.7	mg/L	0.08	0.01		W220081	AS	05/26/12 10:38	
EPA 200.7	Sodium	23.0	mg/L	0.50	0.07		W220081	AS	05/26/12 10:38	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0002		W220081	AS	05/26/12 10:38	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0004		W220081	AS	05/26/12 10:38	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0013		W220081	AS	05/26/12 10:38	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W219367	KWH	05/23/12 10:47	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W219367	KWH	05/23/12 10:47	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000096	2.5	W219367	KWH	05/23/12 10:47	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.00002	2.5	W219367	KWH	05/23/12 10:47	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.00009	2.5	W219367	KWH	05/23/12 10:47	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000072	2.5	W219367	KWH	05/23/12 10:47	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W219367	KWH	05/23/12 10:47	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.000018	2.5	W219367	KWH	05/23/12 10:47	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000009	2.5	W219367	KWH	05/23/12 10:47	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000010	2.5	W219367	KWH	05/23/12 10:47	
SM 2340B	Hardness (as CaCO3)	180	mg/L	0.347	0.140		N/A		05/27/12 11:42	



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2E0270**
Reported: 29-May-12 10:31

Client Sample ID: **27APR12GW008**

SVL Sample ID: **W2E0270-09 (Ground Water)**

Sample Report Page 2 of 3

Sampled: 27-Apr-12 15:31
Received: 09-May-12
Sampled By: MA

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Dissolved)

EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.022		W220091	AS	05/27/12 11:42	
EPA 200.7	Barium	0.152	mg/L	0.0020	0.0006		W220091	AS	05/27/12 11:42	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.014		W220091	AS	05/27/12 11:42	
EPA 200.7	Calcium	41.4	mg/L	0.040	0.013		W220091	AS	05/27/12 11:42	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0015		W220091	AS	05/27/12 11:42	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0014		W220091	AS	05/27/12 11:42	
EPA 200.7	Iron	0.751	mg/L	0.060	0.022		W220091	AS	05/27/12 11:42	
EPA 200.7	Magnesium	18.7	mg/L	0.060	0.026		W220091	AS	05/27/12 11:42	
EPA 200.7	Manganese	1.03	mg/L	0.0040	0.0014		W220091	AS	05/27/12 11:42	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.002		W220091	AS	05/27/12 11:42	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.004		W220091	AS	05/27/12 11:42	
EPA 200.7	Potassium	0.81	mg/L	0.50	0.16		W220091	AS	05/27/12 11:42	
EPA 200.7	Silicon	21.7	mg/L	0.08	0.03		W220091	AS	05/27/12 11:42	
EPA 200.7	Sodium	22.4	mg/L	0.50	0.14		W220091	AS	05/27/12 11:42	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0004		W220091	AS	05/27/12 11:42	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0007		W220091	AS	05/27/12 11:42	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0026		W220091	AS	05/27/12 11:42	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W219369	KWH	05/22/12 11:55	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W219369	KWH	05/22/12 11:55	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000077		W219369	KWH	05/22/12 11:55	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.000014		W219369	KWH	05/22/12 11:55	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.000072		W219369	KWH	05/22/12 11:55	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000058		W219369	KWH	05/22/12 11:55	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W219369	KWH	05/22/12 11:55	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.0000074		W219369	DT	05/25/12 09:25	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000075		W219369	KWH	05/22/12 11:55	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000082		W219369	KWH	05/22/12 11:55	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000054		W220514	DJA	05/21/12 13:53	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0005		W220034	IIT	05/14/12 15:59	H1,N3b
EPA 120.1	Specific conductance	405	µmhos/cm	5.00			W219371	RS	05/11/12 15:30	
EPA 180.1	Turbidity	5.61	NTU	0.100			W219417	SM	05/11/12 10:20	H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W219383	IIT	05/11/12 12:06	
EPA 350.1	Ammonia as N	0.042	mg/L	0.030	0.006		W220246	RHW	05/21/12 12:48	
EPA 353.2	Nitrate/Nitrite as N	< 0.050	mg/L	0.050	0.008		W220154	DKG	05/19/12 13:16	
SM 2320B/2310B	Bicarbonate	229	mg/L	1.0	0.1		W219386	DKS	05/11/12 16:33	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.1		W219386	DKS	05/11/12 16:33	
SM 2320B/2310B	Total Alkalinity	229	mg/L	1.0	0.1		W219386	DKS	05/11/12 16:33	
SM 2540 C	Total Diss. Solids	211	mg/L	10			W219373	RS	05/14/12 09:00	H3
SM 2540 D	Total Susp. Solids	9.0	mg/L	5.0			W219372	RS	05/14/12 09:00	H3
SM 4500 H B	pH @18.0°C	7.83	pH Units				W219386	DKS	05/11/12 16:33	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W219385	IIT	05/11/12 12:40	
SM 4500-P-E	Phosphorus	0.048	mg/L	0.010	0.005		W220149	CCM/S	05/15/12 13:46	



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Kellogg ID 83837-0929

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Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: **W2E0270**

Reported: 29-May-12 10:31

Client Sample ID: **27APR12GW008**

SVL Sample ID: **W2E0270-09 (Ground Water)**

Sample Report Page 3 of 3

Sampled: 27-Apr-12 15:31

Received: 09-May-12

Sampled By: MA

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	5.19	mg/L	0.20	0.03		W221064	AEW	05/21/12 22:23	
EPA 300.0	Fluoride	0.10	mg/L	0.10	0.02		W221064	AEW	05/21/12 22:23	
EPA 300.0	Sulfate as SO4	1.03	mg/L	0.30	0.05		W221064	AEW	05/21/12 22:23	

Cation/Anion Balance and TDS Ratios

Cation Sum: 4.67 meq/L Anion Sum: 4.75 meq/L C/A Balance: -0.83 % Calculated TDS: 291 TDS/cTDS: 0.73 TDS/eC: 0.52

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Brandon Borgias
Systems Manager



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2E0270**
Reported: 29-May-12 10:31

Client Sample ID: **28APR12GW009**

SVL Sample ID: **W2E0270-10 (Ground Water)**

Sample Report Page 1 of 3

Sampled: 27-Apr-12 10:27
Received: 09-May-12
Sampled By: MA

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000054		W220516	DJA	05/21/12 15:38	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.011		W220081	AS	05/26/12 12:42	
EPA 200.7	Barium	0.0298	mg/L	0.0020	0.0003		W220081	AS	05/26/12 12:42	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.007		W220081	AS	05/26/12 12:42	
EPA 200.7	Calcium	35.6	mg/L	0.040	0.006		W220081	AS	05/26/12 12:42	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0008		W220081	AS	05/26/12 12:42	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0007		W220081	AS	05/26/12 12:42	
EPA 200.7	Iron	1.08	mg/L	0.060	0.011		W220081	AS	05/26/12 12:42	
EPA 200.7	Magnesium	19.0	mg/L	0.060	0.013		W220081	AS	05/26/12 12:42	
EPA 200.7	Manganese	0.732	mg/L	0.0040	0.0007		W220081	AS	05/26/12 12:42	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W220081	AS	05/26/12 12:42	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W220081	AS	05/26/12 12:42	
EPA 200.7	Potassium	0.81	mg/L	0.50	0.08		W220081	AS	05/26/12 12:42	
EPA 200.7	Silicon	33.1	mg/L	0.08	0.01		W220081	AS	05/26/12 12:42	
EPA 200.7	Sodium	22.7	mg/L	0.50	0.07		W220081	AS	05/26/12 12:42	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0002		W220081	AS	05/26/12 12:42	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0004		W220081	AS	05/26/12 12:42	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0013		W220081	AS	05/26/12 12:42	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W219367	KWH	05/23/12 10:52	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W219367	KWH	05/23/12 10:52	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000096	2.5	W219367	KWH	05/23/12 10:52	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.00002	2.5	W219367	KWH	05/23/12 10:52	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.00009	2.5	W219367	KWH	05/23/12 10:52	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000072	2.5	W219367	KWH	05/23/12 10:52	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W219367	KWH	05/23/12 10:52	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.000018	2.5	W219367	KWH	05/23/12 10:52	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000009	2.5	W219367	KWH	05/23/12 10:52	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000010	2.5	W219367	KWH	05/23/12 10:52	
SM 2340B	Hardness (as CaCO3)	157	mg/L	0.347	0.140		N/A		05/27/12 11:48	



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: **Suriname Merian 2012 / 113-93245**

Work Order: **W2E0270**

Reported: 29-May-12 10:31

Client Sample ID: **28APR12GW009**

SVL Sample ID: **W2E0270-10 (Ground Water)**

Sample Report Page 2 of 3

Sampled: 27-Apr-12 10:27
Received: 09-May-12
Sampled By: MA

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.022		W220091	AS	05/27/12 11:48	
EPA 200.7	Barium	0.0277	mg/L	0.0020	0.0006		W220091	AS	05/27/12 11:48	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.014		W220091	AS	05/27/12 11:48	
EPA 200.7	Calcium	33.1	mg/L	0.040	0.013		W220091	AS	05/27/12 11:48	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0015		W220091	AS	05/27/12 11:48	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0014		W220091	AS	05/27/12 11:48	
EPA 200.7	Iron	0.995	mg/L	0.060	0.022		W220091	AS	05/27/12 11:48	
EPA 200.7	Magnesium	18.0	mg/L	0.060	0.026		W220091	AS	05/27/12 11:48	
EPA 200.7	Manganese	0.708	mg/L	0.0040	0.0014		W220091	AS	05/27/12 11:48	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.002		W220091	AS	05/27/12 11:48	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.004		W220091	AS	05/27/12 11:48	
EPA 200.7	Potassium	0.78	mg/L	0.50	0.16		W220091	AS	05/27/12 11:48	
EPA 200.7	Silicon	30.4	mg/L	0.08	0.03		W220091	AS	05/27/12 11:48	
EPA 200.7	Sodium	21.6	mg/L	0.50	0.14		W220091	AS	05/27/12 11:48	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0004		W220091	AS	05/27/12 11:48	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0007		W220091	AS	05/27/12 11:48	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0026		W220091	AS	05/27/12 11:48	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W219369	KWH	05/22/12 12:00	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W219369	KWH	05/22/12 12:00	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000077		W219369	KWH	05/22/12 12:00	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.000014		W219369	KWH	05/22/12 12:00	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.000072		W219369	KWH	05/22/12 12:00	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000058		W219369	KWH	05/22/12 12:00	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W219369	KWH	05/22/12 12:00	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.0000074		W219369	DT	05/25/12 09:26	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000075		W219369	KWH	05/22/12 12:00	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000082		W219369	KWH	05/22/12 12:00	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000054		W220514	DJA	05/21/12 13:58	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0005		W219387	IIT	05/11/12 10:37	
EPA 120.1	Specific conductance	368	µmhos/cm	5.00			W219371	RS	05/11/12 15:30	
EPA 180.1	Turbidity	7.58	NTU	0.100			W219417	SM	05/11/12 10:20	H3
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W219383	IIT	05/11/12 12:08	
EPA 350.1	Ammonia as N	0.088	mg/L	0.030	0.006		W220246	RHW	05/21/12 12:50	
EPA 353.2	Nitrate/Nitrite as N	< 0.050	mg/L	0.050	0.008		W220154	DKG	05/19/12 13:17	
SM 2320B/2310B	Bicarbonate	202	mg/L	1.0	0.1		W219386	DKS	05/11/12 16:40	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.1		W219386	DKS	05/11/12 16:40	
SM 2320B/2310B	Total Alkalinity	202	mg/L	1.0	0.1		W219386	DKS	05/11/12 16:40	
SM 2540 C	Total Diss. Solids	216	mg/L	10			W219373	RS	05/14/12 09:00	H3
SM 2540 D	Total Susp. Solids	< 5.0	mg/L	5.0			W219372	RS	05/14/12 09:00	H3
SM 4500 H B	pH @18.0°C	7.82	pH Units				W219386	DKS	05/11/12 16:40	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W219385	IIT	05/11/12 12:42	
SM 4500-P-E	Phosphorus	0.179	mg/L	0.010	0.005		W220149	CCM/S	05/15/12 13:46	



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Kellogg ID 83837-0929

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Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245

Work Order: **W2E0270**

Reported: 29-May-12 10:31

Client Sample ID: **28APR12GW009**

SVL Sample ID: **W2E0270-10 (Ground Water)**

Sample Report Page 3 of 3

Sampled: 27-Apr-12 10:27

Received: 09-May-12

Sampled By: MA

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	5.83	mg/L	0.20	0.03		W221064	AEW	05/21/12 22:34	
EPA 300.0	Fluoride	0.12	mg/L	0.10	0.02		W221064	AEW	05/21/12 22:34	
EPA 300.0	Sulfate as SO4	0.71	mg/L	0.30	0.05		W221064	AEW	05/21/12 22:34	

Cation/Anion Balance and TDS Ratios

Cation Sum: 4.16 meq/L Anion Sum: 4.22 meq/L C/A Balance: -0.72 % Calculated TDS: 290 TDS/cTDS: 0.75 TDS/eC: 0.59

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Brandon Borgias
Systems Manager



Tetra Tech EM, Inc. (Boise)
 3380 Americana Terrace, Suite 201
 Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
 Work Order: **W2E0270**
 Reported: 29-May-12 10:31

Quality Control - BLANK Data

Method	Analyte	Units	Result	MDL	MRL	Batch ID	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	mg/L	<0.00020	0.000054	0.00020	W220516	21-May-12	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	mg/L	<0.080	0.011	0.080	W220081	26-May-12	
EPA 200.7	Barium	mg/L	<0.0020	0.0003	0.0020	W220081	26-May-12	
EPA 200.7	Boron	mg/L	<0.040	0.007	0.040	W220081	26-May-12	
EPA 200.7	Calcium	mg/L	<0.040	0.006	0.040	W220081	26-May-12	
EPA 200.7	Chromium	mg/L	<0.0060	0.0008	0.0060	W220081	26-May-12	
EPA 200.7	Cobalt	mg/L	<0.0060	0.0007	0.0060	W220081	26-May-12	
EPA 200.7	Iron	mg/L	<0.060	0.011	0.060	W220081	26-May-12	
EPA 200.7	Magnesium	mg/L	<0.060	0.013	0.060	W220081	26-May-12	
EPA 200.7	Manganese	mg/L	<0.0040	0.0007	0.0040	W220081	26-May-12	
EPA 200.7	Molybdenum	mg/L	<0.008	0.001	0.008	W220081	26-May-12	
EPA 200.7	Nickel	mg/L	<0.010	0.002	0.010	W220081	26-May-12	
EPA 200.7	Potassium	mg/L	<0.50	0.08	0.50	W220081	26-May-12	
EPA 200.7	Silicon	mg/L	<0.08	0.01	0.08	W220081	26-May-12	
EPA 200.7	Sodium	mg/L	<0.50	0.07	0.50	W220081	26-May-12	
EPA 200.7	Titanium	mg/L	<0.0050	0.0002	0.0050	W220081	26-May-12	
EPA 200.7	Vanadium	mg/L	<0.0050	0.0004	0.0050	W220081	26-May-12	
EPA 200.7	Zinc	mg/L	<0.0100	0.0013	0.0100	W220081	26-May-12	
EPA 200.8	Antimony	mg/L	<0.00300	0.00015	0.00300	W219367	23-May-12	
EPA 200.8	Arsenic	mg/L	<0.0030	0.0003	0.0030	W219367	23-May-12	
EPA 200.8	Beryllium	mg/L	<0.000200	0.000096	0.000200	W219367	23-May-12	
EPA 200.8	Copper	mg/L	<0.00100	0.00009	0.00100	W219367	23-May-12	
EPA 200.8	Lead	mg/L	<0.00300	0.000072	0.00300	W219367	23-May-12	
EPA 200.8	Selenium	mg/L	<0.00300	0.00028	0.00300	W219367	23-May-12	
EPA 200.8	Silver	mg/L	<0.000100	0.000018	0.000100	W219367	23-May-12	
EPA 200.8	Uranium	mg/L	<0.00100	0.000010	0.00100	W219367	23-May-12	
EPA 200.8	Thallium	mg/L	<0.00100	0.000009	0.00100	W219367	23-May-12	
EPA 200.8	Cadmium	mg/L	<0.00020	0.00002	0.00020	W219367	23-May-12	

Metals (Dissolved)

EPA 200.7	Aluminum	mg/L	<0.080	0.022	0.080	W220091	27-May-12	
EPA 200.7	Barium	mg/L	<0.0020	0.0006	0.0020	W220091	27-May-12	
EPA 200.7	Boron	mg/L	<0.040	0.014	0.040	W220091	27-May-12	
EPA 200.7	Calcium	mg/L	<0.040	0.013	0.040	W220091	27-May-12	
EPA 200.7	Chromium	mg/L	<0.0060	0.0015	0.0060	W220091	27-May-12	
EPA 200.7	Cobalt	mg/L	<0.0060	0.0014	0.0060	W220091	27-May-12	
EPA 200.7	Iron	mg/L	<0.060	0.022	0.060	W220091	27-May-12	
EPA 200.7	Magnesium	mg/L	<0.060	0.026	0.060	W220091	27-May-12	
EPA 200.7	Manganese	mg/L	<0.0040	0.0014	0.0040	W220091	27-May-12	
EPA 200.7	Molybdenum	mg/L	<0.008	0.002	0.008	W220091	27-May-12	
EPA 200.7	Nickel	mg/L	<0.010	0.004	0.010	W220091	27-May-12	
EPA 200.7	Potassium	mg/L	<0.50	0.16	0.50	W220091	27-May-12	
EPA 200.7	Silicon	mg/L	<0.08	0.03	0.08	W220091	27-May-12	
EPA 200.7	Sodium	mg/L	<0.50	0.14	0.50	W220091	27-May-12	
EPA 200.7	Titanium	mg/L	<0.0050	0.0004	0.0050	W220091	27-May-12	
EPA 200.7	Vanadium	mg/L	<0.0050	0.0007	0.0050	W220091	27-May-12	
EPA 200.7	Zinc	mg/L	<0.0100	0.0026	0.0100	W220091	27-May-12	
EPA 200.8	Antimony	mg/L	<0.00300	0.00012	0.00300	W219369	22-May-12	
EPA 200.8	Arsenic	mg/L	<0.0030	0.0002	0.0030	W219369	22-May-12	
EPA 200.8	Beryllium	mg/L	<0.000200	0.000077	0.000200	W219369	22-May-12	
EPA 200.8	Cadmium	mg/L	<0.00020	0.000014	0.00020	W219369	22-May-12	
EPA 200.8	Copper	mg/L	<0.00100	0.000072	0.00100	W219369	22-May-12	
EPA 200.8	Lead	mg/L	<0.00300	0.000058	0.00300	W219369	22-May-12	
EPA 200.8	Selenium	mg/L	<0.00300	0.00022	0.00300	W219369	22-May-12	
EPA 200.8	Silver	mg/L	<0.000100	0.0000074	0.000100	W219369	22-May-12	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: **Suriname Merian 2012 / 113-93245**

Work Order: **W2E0270**

Reported: 29-May-12 10:31

Quality Control - BLANK Data (Continued)

Method	Analyte	Units	Result	MDL	MRL	Batch ID	Analyzed	Notes
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Metals (Dissolved) (Continued)

EPA 200.8	Thallium	mg/L	<0.00100	0.0000075	0.00100	W219369	22-May-12	
EPA 200.8	Uranium	mg/L	<0.00100	0.0000082	0.00100	W219369	22-May-12	
EPA 245.1	Mercury	mg/L	<0.00020	0.000054	0.00020	W220514	21-May-12	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	mg/L	<0.005	0.0005	0.005	W219387	11-May-12	
ASTM D7237	Cyanide (free)	mg/L	<0.005	0.0005	0.005	W220034	14-May-12	
EPA 120.1	Specific conductance	µmhos/cm	<5.00		5.00	W219371	11-May-12	
EPA 180.1	Turbidity	NTU	<0.100		0.100	W219417	11-May-12	
EPA 335.4	Cyanide (total)	mg/L	<0.0100	0.0021	0.0100	W219383	11-May-12	
EPA 350.1	Ammonia as N	mg/L	<0.030	0.006	0.030	W220246	21-May-12	
EPA 353.2	Nitrate/Nitrite as N	mg/L	<0.050	0.008	0.050	W220154	19-May-12	
SM 2540 C	Total Diss. Solids	mg/L	<10		10	W219373	14-May-12	
SM 2540 D	Total Susp. Solids	mg/L	<5.0		5.0	W219372	14-May-12	
SM 4500-CN-I	Cyanide (WAD)	mg/L	<0.0100	0.0006	0.0100	W219385	11-May-12	
SM 4500-P-E	Phosphorus	mg/L	<0.010	0.005	0.010	W220149	15-May-12	

Anions by Ion Chromatography

EPA 300.0	Fluoride	mg/L	<0.10	0.02	0.10	W221064	21-May-12	
EPA 300.0	Chloride	mg/L	<0.20	0.03	0.20	W221064	21-May-12	
EPA 300.0	Sulfate as SO4	mg/L	<0.30	0.05	0.30	W221064	21-May-12	

Quality Control - LABORATORY CONTROL SAMPLE Data

Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	mg/L	0.00497	0.00500	99.4	85 - 115	W220516	21-May-12	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	mg/L	0.984	1.00	98.4	85 - 115	W220081	26-May-12	
EPA 200.7	Barium	mg/L	1.02	1.00	102	85 - 115	W220081	26-May-12	
EPA 200.7	Boron	mg/L	1.01	1.00	101	85 - 115	W220081	26-May-12	
EPA 200.7	Calcium	mg/L	20.0	20.0	100	85 - 115	W220081	26-May-12	
EPA 200.7	Chromium	mg/L	1.01	1.00	101	85 - 115	W220081	26-May-12	
EPA 200.7	Cobalt	mg/L	1.01	1.00	101	85 - 115	W220081	26-May-12	
EPA 200.7	Iron	mg/L	10.0	10.0	100	85 - 115	W220081	26-May-12	
EPA 200.7	Magnesium	mg/L	20.0	20.0	100	85 - 115	W220081	26-May-12	
EPA 200.7	Manganese	mg/L	0.996	1.00	99.6	85 - 115	W220081	26-May-12	
EPA 200.7	Molybdenum	mg/L	0.989	1.00	98.9	85 - 115	W220081	26-May-12	
EPA 200.7	Nickel	mg/L	0.962	1.00	96.2	85 - 115	W220081	26-May-12	
EPA 200.7	Potassium	mg/L	20.0	20.0	99.9	85 - 115	W220081	26-May-12	
EPA 200.7	Silicon	mg/L	4.99	5.00	99.8	85 - 115	W220081	26-May-12	
EPA 200.7	Sodium	mg/L	18.0	19.0	95.0	85 - 115	W220081	26-May-12	
EPA 200.7	Titanium	mg/L	1.00	1.00	100	85 - 115	W220081	26-May-12	
EPA 200.7	Vanadium	mg/L	0.984	1.00	98.4	85 - 115	W220081	26-May-12	
EPA 200.7	Zinc	mg/L	0.983	1.00	98.3	85 - 115	W220081	26-May-12	
EPA 200.8	Antimony	mg/L	0.0258	0.0250	103	85 - 115	W219367	23-May-12	
EPA 200.8	Arsenic	mg/L	0.0249	0.0250	99.7	85 - 115	W219367	23-May-12	
EPA 200.8	Beryllium	mg/L	0.0248	0.0250	99.1	85 - 115	W219367	23-May-12	
EPA 200.8	Copper	mg/L	0.0254	0.0250	101	85 - 115	W219367	23-May-12	
EPA 200.8	Lead	mg/L	0.0250	0.0250	99.9	85 - 115	W219367	23-May-12	
EPA 200.8	Selenium	mg/L	0.0252	0.0250	101	85 - 115	W219367	23-May-12	
EPA 200.8	Silver	mg/L	0.0256	0.0250	102	85 - 115	W219367	23-May-12	
EPA 200.8	Uranium	mg/L	0.0244	0.0250	97.7	85 - 115	W219367	23-May-12	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268

Work order Report Page 33 of 39



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2E0270**
Reported: 29-May-12 10:31

Quality Control - LABORATORY CONTROL SAMPLE Data (Continued)

Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Total Recoverable--reportable as Total per 40 CFR 136) (Continued)

EPA 200.8	Thallium	mg/L	0.0242	0.0250	96.9	85 - 115	W219367	23-May-12	
EPA 200.8	Cadmium	mg/L	0.0250	0.0250	100	85 - 115	W219367	23-May-12	

Metals (Dissolved)

EPA 200.7	Aluminum	mg/L	1.11	1.00	111	85 - 115	W220091	27-May-12	
EPA 200.7	Barium	mg/L	1.11	1.00	111	85 - 115	W220091	27-May-12	
EPA 200.7	Boron	mg/L	1.12	1.00	112	85 - 115	W220091	27-May-12	
EPA 200.7	Calcium	mg/L	21.6	20.0	108	85 - 115	W220091	27-May-12	
EPA 200.7	Chromium	mg/L	1.11	1.00	111	85 - 115	W220091	27-May-12	
EPA 200.7	Cobalt	mg/L	1.07	1.00	107	85 - 115	W220091	27-May-12	
EPA 200.7	Iron	mg/L	11.1	10.0	111	85 - 115	W220091	27-May-12	
EPA 200.7	Magnesium	mg/L	22.0	20.0	110	85 - 115	W220091	27-May-12	
EPA 200.7	Manganese	mg/L	1.11	1.00	111	85 - 115	W220091	27-May-12	
EPA 200.7	Molybdenum	mg/L	1.10	1.00	110	85 - 115	W220091	27-May-12	
EPA 200.7	Nickel	mg/L	1.04	1.00	104	85 - 115	W220091	27-May-12	
EPA 200.7	Potassium	mg/L	21.2	20.0	106	85 - 115	W220091	27-May-12	
EPA 200.7	Silicon	mg/L	5.41	5.00	108	85 - 115	W220091	27-May-12	
EPA 200.7	Sodium	mg/L	20.0	19.0	105	85 - 115	W220091	27-May-12	
EPA 200.7	Titanium	mg/L	1.10	1.00	110	85 - 115	W220091	27-May-12	
EPA 200.7	Vanadium	mg/L	1.12	1.00	112	85 - 115	W220091	27-May-12	
EPA 200.7	Zinc	mg/L	1.07	1.00	107	85 - 115	W220091	27-May-12	
EPA 200.8	Antimony	mg/L	0.0268	0.0250	107	85 - 115	W219369	22-May-12	
EPA 200.8	Arsenic	mg/L	0.0272	0.0250	109	85 - 115	W219369	22-May-12	
EPA 200.8	Beryllium	mg/L	0.0266	0.0250	106	85 - 115	W219369	22-May-12	
EPA 200.8	Cadmium	mg/L	0.0271	0.0250	108	85 - 115	W219369	22-May-12	
EPA 200.8	Copper	mg/L	0.0273	0.0250	109	85 - 115	W219369	22-May-12	
EPA 200.8	Lead	mg/L	0.0270	0.0250	108	85 - 115	W219369	22-May-12	
EPA 200.8	Selenium	mg/L	0.0261	0.0250	104	85 - 115	W219369	22-May-12	
EPA 200.8	Silver	mg/L	0.0246	0.0250	98.5	85 - 115	W219369	22-May-12	
EPA 200.8	Thallium	mg/L	0.0259	0.0250	104	85 - 115	W219369	22-May-12	
EPA 200.8	Uranium	mg/L	0.0258	0.0250	103	85 - 115	W219369	22-May-12	
EPA 245.1	Mercury	mg/L	0.00499	0.00500	99.8	85 - 115	W220514	21-May-12	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	mg/L	0.140	0.150	93.3	85 - 115	W219387	11-May-12	
ASTM D7237	Cyanide (free)	mg/L	0.139	0.150	92.7	85 - 115	W220034	14-May-12	
EPA 120.1	Specific conductance	µmhos/cm	486	494	98.4	90 - 110	W219371	11-May-12	
EPA 180.1	Turbidity	NTU	4.34	4.39	98.9	90 - 110	W219417	11-May-12	
EPA 335.4	Cyanide (total)	mg/L	0.153	0.150	102	90 - 110	W219383	11-May-12	
EPA 350.1	Ammonia as N	mg/L	0.758	0.750	101	90 - 110	W220246	21-May-12	
EPA 353.2	Nitrate/Nitrite as N	mg/L	1.99	2.00	99.3	90 - 110	W220154	19-May-12	
SM 4500-CN-I	Cyanide (WAD)	mg/L	0.157	0.150	105	90 - 110	W219385	11-May-12	
SM 4500-P-E	Phosphorus	mg/L	0.727	0.720	101	90 - 110	W220149	15-May-12	

Anions by Ion Chromatography

EPA 300.0	Fluoride	mg/L	1.87	2.00	93.7	90 - 110	W221064	21-May-12	
EPA 300.0	Chloride	mg/L	2.84	3.00	94.8	90 - 110	W221064	21-May-12	
EPA 300.0	Sulfate as SO4	mg/L	9.62	10.0	96.2	90 - 110	W221064	21-May-12	



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2E0270**
Reported: 29-May-12 10:31

Quality Control - DUPLICATE Data

Method	Analyte	Units	Duplicate Result	Sample Result	RPD	RPD Limit	Batch ID	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	mg/L	<0.00020	<0.00020	UDL	20	W220516	21-May-12	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	mg/L	5.49	5.31	3.4	20	W220081	26-May-12	
EPA 200.7	Barium	mg/L	0.0052	0.0051	1.5	20	W220081	26-May-12	
EPA 200.7	Boron	mg/L	<0.040	<0.040	UDL	20	W220081	26-May-12	
EPA 200.7	Calcium	mg/L	5.08	4.88	3.9	20	W220081	26-May-12	
EPA 200.7	Chromium	mg/L	0.170	0.164	3.7	20	W220081	26-May-12	
EPA 200.7	Cobalt	mg/L	0.306	0.296	3.4	20	W220081	26-May-12	
EPA 200.7	Iron	mg/L	848	819	3.5	20	W220081	26-May-12	D2
EPA 200.7	Magnesium	mg/L	0.801	0.779	2.8	20	W220081	26-May-12	
EPA 200.7	Manganese	mg/L	0.0209	0.0206	1.4	20	W220081	26-May-12	
EPA 200.7	Molybdenum	mg/L	<0.008	<0.008	UDL	20	W220081	26-May-12	
EPA 200.7	Nickel	mg/L	0.649	0.623	4.0	20	W220081	26-May-12	
EPA 200.7	Potassium	mg/L	<0.50	<0.50	<RL	20	W220081	26-May-12	
EPA 200.7	Silicon	mg/L	8.21	7.85	4.4	20	W220081	26-May-12	
EPA 200.7	Sodium	mg/L	<0.50	<0.50	<RL	20	W220081	26-May-12	
EPA 200.7	Titanium	mg/L	<0.0050	<0.0050	UDL	20	W220081	26-May-12	
EPA 200.7	Vanadium	mg/L	0.0197	0.0188	4.7	20	W220081	26-May-12	
EPA 200.7	Zinc	mg/L	1.04	1.00	3.9	20	W220081	26-May-12	
EPA 200.8	Antimony	mg/L	<0.00300	<0.00300	UDL	20	W219367	23-May-12	
EPA 200.8	Arsenic	mg/L	<0.0030	<0.0030	UDL	20	W219367	23-May-12	
EPA 200.8	Beryllium	mg/L	<0.000200	<0.000200	UDL	20	W219367	23-May-12	
EPA 200.8	Copper	mg/L	<0.00100	<0.00100	<RL	20	W219367	23-May-12	
EPA 200.8	Lead	mg/L	<0.00300	<0.00300	<RL	20	W219367	23-May-12	
EPA 200.8	Selenium	mg/L	<0.00300	<0.00300	UDL	20	W219367	23-May-12	
EPA 200.8	Silver	mg/L	<0.000100	<0.000100	UDL	20	W219367	23-May-12	
EPA 200.8	Uranium	mg/L	<0.00100	<0.00100	<RL	20	W219367	23-May-12	
EPA 200.8	Thallium	mg/L	<0.00100	<0.00100	<RL	20	W219367	23-May-12	
EPA 200.8	Cadmium	mg/L	<0.00020	<0.00020	<RL	20	W219367	23-May-12	

Metals (Dissolved)

EPA 200.7	Aluminum	mg/L	0.089	0.100	11.4	20	W220091	27-May-12	
EPA 200.7	Barium	mg/L	0.0025	0.0024	5.7	20	W220091	27-May-12	
EPA 200.7	Boron	mg/L	<0.040	<0.040	UDL	20	W220091	27-May-12	
EPA 200.7	Calcium	mg/L	0.299	0.300	0.5	20	W220091	27-May-12	
EPA 200.7	Chromium	mg/L	<0.0060	<0.0060	UDL	20	W220091	27-May-12	
EPA 200.7	Cobalt	mg/L	<0.0060	<0.0060	UDL	20	W220091	27-May-12	
EPA 200.7	Iron	mg/L	0.122	0.127	3.3	20	W220091	27-May-12	
EPA 200.7	Magnesium	mg/L	0.082	0.073	11.1	20	W220091	27-May-12	
EPA 200.7	Manganese	mg/L	0.0275	0.0281	1.9	20	W220091	27-May-12	
EPA 200.7	Molybdenum	mg/L	<0.008	<0.008	UDL	20	W220091	27-May-12	
EPA 200.7	Nickel	mg/L	<0.010	<0.010	UDL	20	W220091	27-May-12	
EPA 200.7	Potassium	mg/L	0.74	0.77	3.8	20	W220091	27-May-12	
EPA 200.7	Silicon	mg/L	10.8	10.8	0.0	20	W220091	27-May-12	
EPA 200.7	Sodium	mg/L	11.4	11.3	0.7	20	W220091	27-May-12	
EPA 200.7	Titanium	mg/L	<0.0050	<0.0050	UDL	20	W220091	27-May-12	
EPA 200.7	Vanadium	mg/L	<0.0050	<0.0050	UDL	20	W220091	27-May-12	
EPA 200.7	Zinc	mg/L	0.0240	0.0239	0.5	20	W220091	27-May-12	
EPA 200.8	Antimony	mg/L	<0.00300	<0.00300	<RL	20	W219369	22-May-12	
EPA 200.8	Arsenic	mg/L	<0.0030	<0.0030	UDL	20	W219369	22-May-12	
EPA 200.8	Beryllium	mg/L	<0.000200	<0.000200	UDL	20	W219369	22-May-12	
EPA 200.8	Cadmium	mg/L	<0.00020	<0.00020	UDL	20	W219369	22-May-12	
EPA 200.8	Copper	mg/L	<0.00100	<0.00100	<RL	20	W219369	22-May-12	
EPA 200.8	Lead	mg/L	<0.00300	<0.00300	<RL	20	W219369	22-May-12	
EPA 200.8	Selenium	mg/L	<0.00300	<0.00300	UDL	20	W219369	22-May-12	
EPA 200.8	Silver	mg/L	<0.000100	<0.000100	UDL	20	W219369	22-May-12	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: W2E0270
Reported: 29-May-12 10:31

Quality Control - DUPLICATE Data (Continued)

Table with 10 columns: Method, Analyte, Units, Duplicate Result, Sample Result, RPD, RPD Limit, Batch ID, Analyzed, Notes

Metals (Dissolved) (Continued)

Table with 10 columns: Method, Analyte, Units, Duplicate Result, Sample Result, RPD, RPD Limit, Batch ID, Analyzed, Notes

Classical Chemistry Parameters

Table with 10 columns: Method, Analyte, Units, Duplicate Result, Sample Result, RPD, RPD Limit, Batch ID, Analyzed, Notes

Anions by Ion Chromatography

Table with 10 columns: Method, Analyte, Units, Duplicate Result, Sample Result, RPD, RPD Limit, Batch ID, Analyzed, Notes

Quality Control - MATRIX SPIKE Data

Table with 10 columns: Method, Analyte, Units, Spike Result, Sample Result (R), Spike Level (S), % Rec., Acceptance Limits, Batch ID, Analyzed, Notes

Metals (Total)

Table with 10 columns: Method, Analyte, Units, Spike Result, Sample Result (R), Spike Level (S), % Rec., Acceptance Limits, Batch ID, Analyzed, Notes

Metals (Total Recoverable--reportable as Total per 40 CFR 136)

Table with 10 columns: Method, Analyte, Units, Spike Result, Sample Result (R), Spike Level (S), % Rec., Acceptance Limits, Batch ID, Analyzed, Notes

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: **Suriname Merian 2012 / 113-93245**

Work Order: **W2E0270**

Reported: 29-May-12 10:31

Quality Control - MATRIX SPIKE Data (Continued)

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Total Recoverable--reportable as Total per 40 CFR 136) (Continued)

EPA 200.7	Manganese	mg/L	1.05	0.0770	1.00	96.9	70 - 130	W220081	26-May-12	
EPA 200.7	Molybdenum	mg/L	0.987	<0.008	1.00	98.7	70 - 130	W220081	26-May-12	
EPA 200.7	Molybdenum	mg/L	0.988	<0.008	1.00	98.8	70 - 130	W220081	26-May-12	
EPA 200.7	Nickel	mg/L	1.64	0.623	1.00	102	70 - 130	W220081	26-May-12	
EPA 200.7	Nickel	mg/L	2.17	1.18	1.00	99.6	70 - 130	W220081	26-May-12	
EPA 200.7	Potassium	mg/L	20.9	<0.50	20.0	102	70 - 130	W220081	26-May-12	
EPA 200.7	Potassium	mg/L	21.5	0.55	20.0	105	70 - 130	W220081	26-May-12	
EPA 200.7	Silicon	mg/L	12.5	7.85	5.00	92.1	70 - 130	W220081	26-May-12	
EPA 200.7	Silicon	mg/L	13.8	10.1	5.00	74.4	70 - 130	W220081	26-May-12	
EPA 200.7	Sodium	mg/L	18.7	<0.50	19.0	97.5	70 - 130	W220081	26-May-12	
EPA 200.7	Sodium	mg/L	19.2	<0.50	19.0	100	70 - 130	W220081	26-May-12	
EPA 200.7	Titanium	mg/L	1.03	<0.0050	1.00	103	70 - 130	W220081	26-May-12	
EPA 200.7	Titanium	mg/L	1.03	<0.0050	1.00	103	70 - 130	W220081	26-May-12	
EPA 200.7	Vanadium	mg/L	1.03	0.0188	1.00	101	70 - 130	W220081	26-May-12	
EPA 200.7	Vanadium	mg/L	1.04	0.0337	1.00	100	70 - 130	W220081	26-May-12	
EPA 200.7	Zinc	mg/L	1.96	1.00	1.00	96.0	70 - 130	W220081	26-May-12	
EPA 200.7	Zinc	mg/L	1.41	0.516	1.00	89.4	70 - 130	W220081	26-May-12	
EPA 200.8	Antimony	mg/L	0.0246	<0.00300	0.0250	98.3	70 - 130	W219367	23-May-12	
EPA 200.8	Arsenic	mg/L	0.0242	<0.0030	0.0250	96.9	70 - 130	W219367	23-May-12	
EPA 200.8	Beryllium	mg/L	0.0246	<0.000200	0.0250	98.3	70 - 130	W219367	23-May-12	
EPA 200.8	Copper	mg/L	0.0251	<0.00100	0.0250	97.7	70 - 130	W219367	23-May-12	
EPA 200.8	Lead	mg/L	0.0262	<0.00300	0.0250	99.5	70 - 130	W219367	23-May-12	
EPA 200.8	Selenium	mg/L	0.0243	<0.00300	0.0250	97.0	70 - 130	W219367	23-May-12	
EPA 200.8	Silver	mg/L	0.0252	<0.000100	0.0250	101	70 - 130	W219367	23-May-12	
EPA 200.8	Uranium	mg/L	0.0251	<0.00100	0.0250	99.4	70 - 130	W219367	23-May-12	
EPA 200.8	Thallium	mg/L	0.0241	<0.00100	0.0250	96.4	70 - 130	W219367	23-May-12	
EPA 200.8	Cadmium	mg/L	0.0248	<0.00020	0.0250	99.0	70 - 130	W219367	23-May-12	

Metals (Dissolved)

EPA 200.7	Aluminum	mg/L	1.17	0.100	1.00	107	70 - 130	W220091	27-May-12	
EPA 200.7	Aluminum	mg/L	7.71	7.01	1.00	R > 4S	70 - 130	W220091	27-May-12	M3
EPA 200.7	Barium	mg/L	1.09	0.0024	1.00	108	70 - 130	W220091	27-May-12	
EPA 200.7	Barium	mg/L	1.05	0.0157	1.00	104	70 - 130	W220091	27-May-12	
EPA 200.7	Boron	mg/L	1.11	<0.040	1.00	111	70 - 130	W220091	27-May-12	
EPA 200.7	Boron	mg/L	1.14	0.073	1.00	107	70 - 130	W220091	27-May-12	
EPA 200.7	Calcium	mg/L	21.4	0.300	20.0	106	70 - 130	W220091	27-May-12	
EPA 200.7	Calcium	mg/L	172	154	20.0	93.3	70 - 130	W220091	27-May-12	M3
EPA 200.7	Chromium	mg/L	1.08	<0.0060	1.00	108	70 - 130	W220091	27-May-12	
EPA 200.7	Chromium	mg/L	1.03	<0.0060	1.00	103	70 - 130	W220091	27-May-12	
EPA 200.7	Cobalt	mg/L	1.05	<0.0060	1.00	105	70 - 130	W220091	27-May-12	
EPA 200.7	Cobalt	mg/L	1.06	0.0564	1.00	100	70 - 130	W220091	27-May-12	
EPA 200.7	Iron	mg/L	10.9	0.127	10.0	108	70 - 130	W220091	27-May-12	
EPA 200.7	Iron	mg/L	10.3	0.060	10.0	102	70 - 130	W220091	27-May-12	
EPA 200.7	Magnesium	mg/L	21.8	0.073	20.0	109	70 - 130	W220091	27-May-12	
EPA 200.7	Magnesium	mg/L	54.4	34.9	20.0	97.4	70 - 130	W220091	27-May-12	
EPA 200.7	Manganese	mg/L	1.11	0.0281	1.00	108	70 - 130	W220091	27-May-12	
EPA 200.7	Manganese	mg/L	3.20	2.23	1.00	96.8	70 - 130	W220091	27-May-12	
EPA 200.7	Molybdenum	mg/L	1.07	<0.008	1.00	107	70 - 130	W220091	27-May-12	
EPA 200.7	Molybdenum	mg/L	1.03	<0.008	1.00	103	70 - 130	W220091	27-May-12	
EPA 200.7	Nickel	mg/L	1.03	<0.010	1.00	103	70 - 130	W220091	27-May-12	
EPA 200.7	Nickel	mg/L	1.09	0.087	1.00	100	70 - 130	W220091	27-May-12	
EPA 200.7	Potassium	mg/L	21.7	0.77	20.0	105	70 - 130	W220091	27-May-12	
EPA 200.7	Potassium	mg/L	27.2	6.97	20.0	101	70 - 130	W220091	27-May-12	
EPA 200.7	Silicon	mg/L	16.3	10.8	5.00	111	70 - 130	W220091	27-May-12	
EPA 200.7	Silicon	mg/L	20.1	15.2	5.00	97.8	70 - 130	W220091	27-May-12	
EPA 200.7	Sodium	mg/L	30.6	11.3	19.0	101	70 - 130	W220091	27-May-12	
EPA 200.7	Sodium	mg/L	105	86.3	19.0	97.9	70 - 130	W220091	27-May-12	M3

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268

Work order Report Page 37 of 39



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2E0270**
Reported: 29-May-12 10:31

Quality Control - MATRIX SPIKE Data (Continued)

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Dissolved) (Continued)

EPA 200.7	Titanium	mg/L	1.07	<0.0050	1.00	107	70 - 130	W220091	27-May-12	
EPA 200.7	Titanium	mg/L	1.04	<0.0050	1.00	104	70 - 130	W220091	27-May-12	
EPA 200.7	Vanadium	mg/L	1.09	<0.0050	1.00	109	70 - 130	W220091	27-May-12	
EPA 200.7	Vanadium	mg/L	1.06	<0.0050	1.00	106	70 - 130	W220091	27-May-12	
EPA 200.7	Zinc	mg/L	1.09	0.0239	1.00	107	70 - 130	W220091	27-May-12	
EPA 200.7	Zinc	mg/L	1.44	0.450	1.00	99.3	70 - 130	W220091	27-May-12	
EPA 200.8	Antimony	mg/L	0.0282	<0.00300	0.0250	111	70 - 130	W219369	22-May-12	
EPA 200.8	Arsenic	mg/L	0.0254	<0.00300	0.0250	102	70 - 130	W219369	22-May-12	
EPA 200.8	Beryllium	mg/L	0.0276	<0.000200	0.0250	111	70 - 130	W219369	22-May-12	
EPA 200.8	Cadmium	mg/L	0.0280	<0.00020	0.0250	112	70 - 130	W219369	22-May-12	
EPA 200.8	Copper	mg/L	0.0259	<0.00100	0.0250	101	70 - 130	W219369	22-May-12	
EPA 200.8	Lead	mg/L	0.0297	<0.00300	0.0250	115	70 - 130	W219369	22-May-12	
EPA 200.8	Selenium	mg/L	0.0265	<0.00300	0.0250	106	70 - 130	W219369	22-May-12	
EPA 200.8	Silver	mg/L	0.0251	<0.000100	0.0250	100	70 - 130	W219369	22-May-12	
EPA 200.8	Thallium	mg/L	0.0273	<0.00100	0.0250	109	70 - 130	W219369	22-May-12	
EPA 200.8	Uranium	mg/L	0.0277	<0.00100	0.0250	110	70 - 130	W219369	22-May-12	
EPA 245.1	Mercury	mg/L	0.00096	<0.00020	0.00100	95.9	70 - 130	W220514	21-May-12	
EPA 245.1	Mercury	mg/L	0.00101	<0.00020	0.00100	101	70 - 130	W220514	21-May-12	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	mg/L	0.124	0.043	0.100	81.0	85 - 115	W219387	11-May-12	M2
ASTM D7237	Cyanide (free)	mg/L	0.095	<0.005	0.100	95.0	85 - 115	W219387	11-May-12	
ASTM D7237	Cyanide (free)	mg/L	0.094	<0.005	0.100	94.0	85 - 115	W220034	14-May-12	
EPA 335.4	Cyanide (total)	mg/L	0.104	<0.0100	0.100	104	90 - 110	W219383	11-May-12	
EPA 350.1	Ammonia as N	mg/L	0.593	0.036	0.500	112	90 - 110	W220246	21-May-12	M1
EPA 350.1	Ammonia as N	mg/L	0.548	0.042	0.500	101	90 - 110	W220246	21-May-12	
EPA 353.2	Nitrate/Nitrite as N	mg/L	1.08	<0.050	1.00	108	90 - 110	W220154	19-May-12	
EPA 353.2	Nitrate/Nitrite as N	mg/L	6.52	5.13	1.00	R > 4S	90 - 110	W220154	19-May-12	D2,M3
SM 4500-CN-I	Cyanide (WAD)	mg/L	0.104	<0.0100	0.100	104	75 - 125	W219385	11-May-12	
SM 4500-P-E	Phosphorus	mg/L	0.511	0.046	0.500	92.9	75 - 125	W220149	15-May-12	

Anions by Ion Chromatography

EPA 300.0	Fluoride	mg/L	1.89	<0.10	2.00	94.7	90 - 110	W221064	22-May-12	
EPA 300.0	Chloride	mg/L	6.86	3.75	3.00	103	90 - 110	W221064	22-May-12	
EPA 300.0	Sulfate as SO4	mg/L	16.8	6.18	10.0	106	90 - 110	W221064	22-May-12	

Quality Control - MATRIX SPIKE DUPLICATE Data

Method	Analyte	Units	MSD Result	Spike Result	Spike Level	RPD	RPD Limit	Batch ID	Analyzed	Notes
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Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	mg/L	0.127	0.124	0.100	2.4	20	W219387	11-May-12	M2
ASTM D7237	Cyanide (free)	mg/L	0.099	0.095	0.100	4.1	20	W219387	11-May-12	
ASTM D7237	Cyanide (free)	mg/L	0.096	0.094	0.100	2.1	20	W220034	14-May-12	



Tetra Tech EM, Inc. (Boise)
3380 Americana Terrace, Suite 201
Boise, ID 83707

Project Name: Suriname Merian 2012 / 113-93245
Work Order: **W2E0270**
Reported: 29-May-12 10:31

Notes and Definitions

D2	Sample required dilution due to high concentration of target analyte.
H1	Sample analysis performed past holding time.
H3	Sample was received and analyzed past holding time.
H5	This test is specified to be performed in the field within 15 minutes of sampling; sample was received and analyzed past the regulatory holding time.
M1	Matrix spike recovery was high, but the LCS recovery was acceptable.
M2	Matrix spike recovery was low, but the LCS recovery was acceptable.
M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to spike level. The LCS was acceptable.
N3	Filtered slow; reduced volume.
N3a	Slow to filter; reduced volume.
N3b	treated with CdCO ₃ to remove possible Sulfide interference
R1	RPD exceeded the method acceptance limit.
R2	RPD exceeded the laboratory acceptance limit.
LCS	Laboratory Control Sample (Blank Spike)
RPD	Relative Percent Difference
UDL	A result is less than the detection limit
R > 4S	% recovery not applicable, sample concentration more than four times greater than spike level
<RL	A result is less than the reporting limit
MRL	Method Reporting Limit
MDL	Method Detection Limit
N/A	Not Applicable



Newmont - Surgold LLC
Surinamestraat #54
Paramaribo, SURINAME -

Project Name: Suriname - Merian Gold 2012
Work Order: **W2E0651**
Reported: 13-Jun-12 10:13

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Sampled By	Date Received
15MAY12GW001	W2E0651-01	Ground Water	15-May-12 14:50	MA	23-May-2012
15MAY12GW101	W2E0651-02	Ground Water	15-May-12 14:50	MA	23-May-2012
16MAY12GW002	W2E0651-03	Ground Water	16-May-12 10:25	MA	23-May-2012
16MAY12GW003	W2E0651-04	Ground Water	16-May-12 11:17	MA	23-May-2012
16MAY12GW004	W2E0651-05	Ground Water	16-May-12 15:00	MA	23-May-2012
17MAY12GW005	W2E0651-06	Ground Water	17-May-12 15:07	MA	23-May-2012
18MAY12GW006	W2E0651-07	Ground Water	18-May-12 10:45	MA	23-May-2012
18MAY12GW007	W2E0651-08	Ground Water	18-May-12 13:05	MA	23-May-2012
19MAY12GW008	W2E0651-09	Ground Water	19-May-12 10:30	MA	23-May-2012
19MAY12GW009	W2E0651-10	Ground Water	19-May-12 12:30	MA	23-May-2012

Solid samples are analyzed on an as-received, wet-weight basis, unless otherwise requested. Non-Detects are reported at the MDL.

Sample preparation is defined by the client as per their Data Quality Objectives.

This report supercedes any previous reports for this Work Order. The complete report includes pages for each sample, a full QC report, and a notes section.

The results presented in this report relate only to the samples, and meet all requirements of the NELAC Standards unless otherwise noted.

(Q6) SVL received the following containers outside of published EPA guidelines for preservation temperatures (0-6°C).

The guidelines do not pertain to nitric-preserved metals.

Default Cooler (Received Temperature: 16.4°C)

Labnumber	Container	Client ID	Labnumber	Container	Client ID
W2E0651-01 A	Raw HDPE	15MAY12GW001	W2E0651-01 B	Sulfuric HDPE	15MAY12GW001
W2E0651-01 C	Filtered nitric HDPE	15MAY12GW001	W2E0651-01 D	Nitric HDPE	15MAY12GW001
W2E0651-01 E	NaOH HDPE	15MAY12GW001	W2E0651-02 A	Raw HDPE	15MAY12GW101
W2E0651-02 B	Sulfuric HDPE	15MAY12GW101	W2E0651-02 C	Filtered nitric HDPE	15MAY12GW101
W2E0651-02 D	Nitric HDPE	15MAY12GW101	W2E0651-02 E	NaOH HDPE	15MAY12GW101
W2E0651-03 A	Raw HDPE	16MAY12GW002	W2E0651-03 B	Sulfuric HDPE	16MAY12GW002
W2E0651-03 C	Filtered nitric HDPE	16MAY12GW002	W2E0651-03 D	Nitric HDPE	16MAY12GW002
W2E0651-03 E	NaOH HDPE	16MAY12GW002	W2E0651-04 A	Raw HDPE	16MAY12GW003
W2E0651-04 B	Sulfuric HDPE	16MAY12GW003	W2E0651-04 C	Filtered nitric HDPE	16MAY12GW003
W2E0651-04 D	Nitric HDPE	16MAY12GW003	W2E0651-04 E	NaOH HDPE	16MAY12GW003
W2E0651-05 A	Raw HDPE	16MAY12GW004	W2E0651-05 B	Sulfuric HDPE	16MAY12GW004
W2E0651-05 C	Filtered nitric HDPE	16MAY12GW004	W2E0651-05 D	Nitric HDPE	16MAY12GW004
W2E0651-05 E	NaOH HDPE	16MAY12GW004	W2E0651-06 A	Raw HDPE	17MAY12GW005
W2E0651-06 B	Sulfuric HDPE	17MAY12GW005	W2E0651-06 C	Filtered nitric HDPE	17MAY12GW005
W2E0651-06 D	Nitric HDPE	17MAY12GW005	W2E0651-06 E	NaOH HDPE	17MAY12GW005
W2E0651-07 A	Raw HDPE	18MAY12GW006	W2E0651-07 B	Sulfuric HDPE	18MAY12GW006
W2E0651-07 C	Filtered nitric HDPE	18MAY12GW006	W2E0651-07 D	Nitric HDPE	18MAY12GW006
W2E0651-07 E	NaOH HDPE	18MAY12GW006	W2E0651-08 A	Raw HDPE	18MAY12GW007
W2E0651-08 B	Sulfuric HDPE	18MAY12GW007	W2E0651-08 C	Filtered nitric HDPE	18MAY12GW007
W2E0651-08 D	Nitric HDPE	18MAY12GW007	W2E0651-08 E	NaOH HDPE	18MAY12GW007
W2E0651-09 A	Raw HDPE	19MAY12GW008	W2E0651-09 B	Sulfuric HDPE	19MAY12GW008
W2E0651-09 C	Filtered nitric HDPE	19MAY12GW008	W2E0651-09 D	Nitric HDPE	19MAY12GW008
W2E0651-09 E	NaOH HDPE	19MAY12GW008	W2E0651-10 A	Raw HDPE	19MAY12GW009
W2E0651-10 B	Sulfuric HDPE	19MAY12GW009	W2E0651-10 C	Filtered nitric HDPE	19MAY12GW009
W2E0651-10 D	Nitric HDPE	19MAY12GW009	W2E0651-10 E	NaOH HDPE	19MAY12GW009



Newmont - Surgold LLC
Surinamestraat #54
Paramaribo, SURINAME -

Project Name: Suriname - Merian Gold 2012
Work Order: **W2E0651**
Reported: 13-Jun-12 10:13

Client Sample ID: **15MAY12GW001**

SVL Sample ID: **W2E0651-01 (Ground Water)**

Sample Report Page 1 of 3

Sampled: 15-May-12 14:50
Received: 23-May-12
Sampled By: MA

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000054		W223228	DJA	06/07/12 14:21	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.011		W221300	AS	06/09/12 12:57	
EPA 200.7	Barium	0.0231	mg/L	0.0020	0.0003		W221300	AS	06/09/12 12:57	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.007		W221300	AS	06/09/12 12:57	
EPA 200.7	Calcium	12.9	mg/L	0.040	0.006		W221300	AS	06/09/12 12:57	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0008		W221300	AS	06/09/12 12:57	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0007		W221300	AS	06/09/12 12:57	
EPA 200.7	Iron	2.55	mg/L	0.060	0.011		W221300	AS	06/09/12 12:57	
EPA 200.7	Magnesium	8.80	mg/L	0.060	0.013		W221300	AS	06/09/12 12:57	
EPA 200.7	Manganese	0.599	mg/L	0.0040	0.0007		W221300	AS	06/09/12 12:57	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W221300	AS	06/09/12 12:57	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W221300	AS	06/09/12 12:57	
EPA 200.7	Potassium	0.85	mg/L	0.50	0.08		W221300	AS	06/09/12 12:57	
EPA 200.7	Silicon	33.1	mg/L	0.08	0.01		W221300	AS	06/09/12 12:57	
EPA 200.7	Sodium	22.4	mg/L	0.50	0.07		W221300	AS	06/09/12 12:57	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0002		W221300	AS	06/09/12 12:57	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0004		W221300	AS	06/09/12 12:57	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0013		W221300	AS	06/09/12 12:57	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W222010	DT	06/08/12 15:50	
EPA 200.8	Arsenic	0.0031	mg/L	0.0030	0.0003	2.5	W222010	DT	06/08/12 15:50	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000096	2.5	W222010	DT	06/08/12 15:50	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.00002	2.5	W222010	DT	06/08/12 15:50	
EPA 200.8	Copper	0.00110	mg/L	0.00100	0.00009	2.5	W222010	DT	06/08/12 15:50	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000072	2.5	W222010	DT	06/08/12 15:50	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W222010	DT	06/08/12 15:50	
EPA 200.8	Silver	0.000210	mg/L	0.000100	0.000018	2.5	W222010	DT	06/08/12 15:50	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000009	2.5	W222010	DT	06/08/12 15:50	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000010	2.5	W222010	DT	06/08/12 15:50	
SM 2340B	Hardness (as CaCO3)	65.7	mg/L	0.347	0.140		N/A		06/08/12 14:38	



Newmont - Surgold LLC
 Surinamestraat #54
 Paramaribo, SURINAME -

Project Name: Suriname - Merian Gold 2012
 Work Order: **W2E0651**
 Reported: 13-Jun-12 10:13

Client Sample ID: **15MAY12GW001**

SVL Sample ID: **W2E0651-01 (Ground Water)**

Sample Report Page 2 of 3

Sampled: 15-May-12 14:50
 Received: 23-May-12
 Sampled By: MA

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Dissolved)

EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.022		W221299	TJK	06/08/12 14:38	
EPA 200.7	Barium	0.0209	mg/L	0.0020	0.0006		W221299	TJK	06/08/12 14:38	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.014		W221299	TJK	06/08/12 14:38	
EPA 200.7	Calcium	12.5	mg/L	0.040	0.013		W221299	TJK	06/08/12 14:38	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0015		W221299	TJK	06/08/12 14:38	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0014		W221299	TJK	06/08/12 14:38	
EPA 200.7	Iron	2.41	mg/L	0.060	0.022		W221299	TJK	06/08/12 16:17	
EPA 200.7	Magnesium	8.39	mg/L	0.060	0.026		W221299	TJK	06/08/12 14:38	
EPA 200.7	Manganese	0.578	mg/L	0.0040	0.0014		W221299	TJK	06/08/12 14:38	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.002		W221299	TJK	06/08/12 14:38	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.004		W221299	TJK	06/08/12 14:38	
EPA 200.7	Potassium	0.94	mg/L	0.50	0.16		W221299	TJK	06/08/12 14:38	
EPA 200.7	Silicon	32.6	mg/L	0.08	0.03		W221299	TJK	06/08/12 16:17	
EPA 200.7	Sodium	24.4	mg/L	0.50	0.14		W221299	TJK	06/08/12 14:38	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0004		W221299	TJK	06/08/12 14:38	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0007		W221299	TJK	06/08/12 14:38	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0026		W221299	TJK	06/08/12 14:38	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W222018	KWH	06/12/12 07:50	
EPA 200.8	Arsenic	0.0036	mg/L	0.0030	0.0002		W222018	KWH	06/12/12 07:50	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000077		W222018	KWH	06/12/12 07:50	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.000014		W222018	KWH	06/12/12 07:50	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.000072		W222018	KWH	06/13/12 08:18	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000058		W222018	KWH	06/12/12 07:50	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W222018	KWH	06/12/12 07:50	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.0000074		W222018	KWH	06/13/12 08:18	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000075		W222018	KWH	06/12/12 07:50	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000082		W222018	KWH	06/12/12 07:50	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000054		W223223	DJA	06/07/12 13:43	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0004		W222025	IIT	05/29/12 16:31	N3a
EPA 120.1	Specific conductance	246	µmhos/cm	5.00			W221316	RS	05/24/12 09:55	
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W222023	IIT	05/29/12 11:20	
EPA 350.1	Ammonia as N	0.100	mg/L	0.030	0.006		W223013	RHW	06/07/12 10:50	
EPA 353.2	Nitrate/Nitrite as N	< 0.050	mg/L	0.050	0.008		W223018	RHW	06/06/12 13:27	
SM 2320B/2310B	Bicarbonate	108	mg/L	1.0	0.1		W221360	AAS	05/25/12 14:53	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.1		W221360	AAS	05/25/12 14:53	
SM 2320B/2310B	Total Alkalinity	108	mg/L	1.0	0.1		W221360	AAS	05/25/12 14:53	
SM 2540 C	Total Diss. Solids	176	mg/L	10			W221321	RS	05/24/12 12:15	H3
SM 2540 D	Total Susp. Solids	< 5.0	mg/L	5.0			W221319	RS	05/24/12 12:15	H3
SM 4500 H B	pH @22.0°C	7.42	pH Units				W221360	AAS	05/25/12 14:53	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W221311	IIT	05/29/12 10:26	
SM 4500-P-E	Phosphorus	0.381	mg/L	0.010	0.005		W221383	CCM/S	05/25/12 12:57	



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Newmont - Surgold LLC
Surinamestraat #54
Paramaribo, SURINAME -

Project Name: Suriname - Merian Gold 2012

Work Order: **W2E0651**

Reported: 13-Jun-12 10:13

Client Sample ID: **15MAY12GW001**

SVL Sample ID: **W2E0651-01 (Ground Water)**

Sample Report Page 3 of 3

Sampled: 15-May-12 14:50

Received: 23-May-12

Sampled By: MA

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	9.82	mg/L	0.20	0.03		W223310	AEW	06/07/12 21:21	
EPA 300.0	Fluoride	0.27	mg/L	0.10	0.02		W223310	AEW	06/07/12 21:21	
EPA 300.0	Sulfate as SO4	1.37	mg/L	0.30	0.05		W223310	AEW	06/07/12 21:21	

Cation/Anion Balance and TDS Ratios

Cation Sum: 2.43 meq/L Anion Sum: 2.48 meq/L C/A Balance: -1.06 % Calculated TDS: 211 TDS/cTDS: 0.83 TDS/eC: 0.72

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Newmont - Surgold LLC
Surinamestraat #54
Paramaribo, SURINAME -

Project Name: Suriname - Merian Gold 2012
Work Order: **W2E0651**
Reported: 13-Jun-12 10:13

Client Sample ID: **15MAY12GW101**

SVL Sample ID: **W2E0651-02 (Ground Water)**

Sample Report Page 1 of 3

Sampled: 15-May-12 14:50
Received: 23-May-12
Sampled By: MA

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000054		W223228	DJA	06/07/12 14:23	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.011		W221300	AS	06/09/12 13:15	
EPA 200.7	Barium	0.0231	mg/L	0.0020	0.0003		W221300	AS	06/09/12 13:15	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.007		W221300	AS	06/09/12 13:15	
EPA 200.7	Calcium	13.1	mg/L	0.040	0.006		W221300	AS	06/09/12 13:15	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0008		W221300	AS	06/09/12 13:15	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0007		W221300	AS	06/09/12 13:15	
EPA 200.7	Iron	2.53	mg/L	0.060	0.011		W221300	AS	06/09/12 13:15	
EPA 200.7	Magnesium	8.78	mg/L	0.060	0.013		W221300	AS	06/09/12 13:15	
EPA 200.7	Manganese	0.600	mg/L	0.0040	0.0007		W221300	AS	06/09/12 13:15	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W221300	AS	06/09/12 13:15	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W221300	AS	06/09/12 13:15	
EPA 200.7	Potassium	0.91	mg/L	0.50	0.08		W221300	AS	06/09/12 13:15	
EPA 200.7	Silicon	33.4	mg/L	0.08	0.01		W221300	AS	06/09/12 13:15	
EPA 200.7	Sodium	22.7	mg/L	0.50	0.07		W221300	AS	06/09/12 13:15	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0002		W221300	AS	06/09/12 13:15	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0004		W221300	AS	06/09/12 13:15	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0013		W221300	AS	06/09/12 13:15	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W222010	DT	06/08/12 15:56	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W222010	DT	06/08/12 15:56	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000096	2.5	W222010	DT	06/08/12 15:56	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.00002	2.5	W222010	DT	06/08/12 15:56	
EPA 200.8	Copper	0.00113	mg/L	0.00100	0.00009	2.5	W222010	DT	06/08/12 15:56	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000072	2.5	W222010	DT	06/08/12 15:56	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W222010	DT	06/08/12 15:56	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.000018	2.5	W222010	DT	06/08/12 15:56	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000009	2.5	W222010	DT	06/08/12 15:56	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000010	2.5	W222010	DT	06/08/12 15:56	
SM 2340B	Hardness (as CaCO3)	66.3	mg/L	0.347	0.140		N/A		06/08/12 14:54	



Newmont - Surgold LLC
 Surinamestraat #54
 Paramaribo, SURINAME -

Project Name: Suriname - Merian Gold 2012
 Work Order: **W2E0651**
 Reported: 13-Jun-12 10:13

Client Sample ID: **15MAY12GW101**

SVL Sample ID: **W2E0651-02 (Ground Water)**

Sample Report Page 2 of 3

Sampled: 15-May-12 14:50
 Received: 23-May-12
 Sampled By: MA

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Dissolved)

EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.022		W221299	TJK	06/08/12 14:54	
EPA 200.7	Barium	0.0209	mg/L	0.0020	0.0006		W221299	TJK	06/08/12 14:54	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.014		W221299	TJK	06/08/12 14:54	
EPA 200.7	Calcium	12.5	mg/L	0.040	0.013		W221299	TJK	06/08/12 14:54	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0015		W221299	TJK	06/08/12 14:54	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0014		W221299	TJK	06/08/12 14:54	
EPA 200.7	Iron	2.41	mg/L	0.060	0.022		W221299	TJK	06/08/12 16:36	
EPA 200.7	Magnesium	8.52	mg/L	0.060	0.026		W221299	TJK	06/08/12 14:54	
EPA 200.7	Manganese	0.587	mg/L	0.0040	0.0014		W221299	TJK	06/08/12 14:54	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.002		W221299	TJK	06/08/12 14:54	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.004		W221299	TJK	06/08/12 14:54	
EPA 200.7	Potassium	0.95	mg/L	0.50	0.16		W221299	TJK	06/08/12 14:54	
EPA 200.7	Silicon	32.8	mg/L	0.08	0.03		W221299	TJK	06/08/12 16:36	
EPA 200.7	Sodium	25.3	mg/L	0.50	0.14		W221299	TJK	06/08/12 14:54	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0004		W221299	TJK	06/08/12 14:54	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0007		W221299	TJK	06/08/12 14:54	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0026		W221299	TJK	06/08/12 14:54	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W222018	KWH	06/12/12 08:04	
EPA 200.8	Arsenic	0.0036	mg/L	0.0030	0.0002		W222018	KWH	06/12/12 08:04	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000077		W222018	KWH	06/12/12 08:04	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.000014		W222018	KWH	06/12/12 08:04	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.000072		W222018	KWH	06/13/12 08:23	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000058		W222018	KWH	06/12/12 08:04	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W222018	KWH	06/12/12 08:04	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.0000074		W222018	KWH	06/13/12 08:23	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000075		W222018	KWH	06/12/12 08:04	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000082		W222018	KWH	06/12/12 08:04	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000054		W223223	DJA	06/07/12 13:51	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0004		W222025	IIT	05/29/12 16:33	N3a
EPA 120.1	Specific conductance	250	µmhos/cm	5.00			W221316	RS	05/24/12 09:55	
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W222023	IIT	05/29/12 11:22	
EPA 350.1	Ammonia as N	0.097	mg/L	0.030	0.006		W223013	RHW	06/07/12 10:51	
EPA 353.2	Nitrate/Nitrite as N	< 0.050	mg/L	0.050	0.008		W223018	RHW	06/06/12 13:28	
SM 2320B/2310B	Bicarbonate	115	mg/L	1.0	0.1		W221360	AAS	05/25/12 14:59	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.1		W221360	AAS	05/25/12 14:59	
SM 2320B/2310B	Total Alkalinity	115	mg/L	1.0	0.1		W221360	AAS	05/25/12 14:59	
SM 2540 C	Total Diss. Solids	184	mg/L	10			W221321	RS	05/24/12 12:15	H3
SM 2540 D	Total Susp. Solids	< 5.0	mg/L	5.0			W221319	RS	05/24/12 12:15	H3
SM 4500 H B	pH @22.0°C	7.34	pH Units				W221360	AAS	05/25/12 14:59	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W221311	IIT	05/29/12 10:28	
SM 4500-P-E	Phosphorus	0.384	mg/L	0.010	0.005		W221383	CCM/S	05/25/12 12:57	



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Newmont - Surgold LLC
Surinamestraat #54
Paramaribo, SURINAME -

Project Name: Suriname - Merian Gold 2012
Work Order: **W2E0651**
Reported: 13-Jun-12 10:13

Client Sample ID: **15MAY12GW101**

SVL Sample ID: **W2E0651-02 (Ground Water)**

Sample Report Page 3 of 3

Sampled: 15-May-12 14:50
Received: 23-May-12
Sampled By: MA

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	9.79	mg/L	0.20	0.03		W223310	AEW	06/07/12 21:32	
EPA 300.0	Fluoride	0.28	mg/L	0.10	0.02		W223310	AEW	06/07/12 21:32	
EPA 300.0	Sulfate as SO4	1.37	mg/L	0.30	0.05		W223310	AEW	06/07/12 21:32	

Cation/Anion Balance and TDS Ratios

Cation Sum: 2.45 meq/L Anion Sum: 2.62 meq/L C/A Balance: -3.28 % Calculated TDS: 216 TDS/cTDS: 0.85 TDS/eC: 0.74

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Newmont - Surgold LLC
 Surinamestraat #54
 Paramaribo, SURINAME -

Project Name: Suriname - Merian Gold 2012
 Work Order: **W2E0651**
 Reported: 13-Jun-12 10:13

Client Sample ID: **16MAY12GW002**

SVL Sample ID: **W2E0651-03 (Ground Water)**

Sample Report Page 1 of 3

Sampled: 16-May-12 10:25
 Received: 23-May-12
 Sampled By: MA

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000054		W223228	DJA	06/07/12 14:28	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	0.086	mg/L	0.080	0.011		W221300	AS	06/09/12 13:21	
EPA 200.7	Barium	0.0060	mg/L	0.0020	0.0003		W221300	AS	06/09/12 13:21	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.007		W221300	AS	06/09/12 13:21	
EPA 200.7	Calcium	0.291	mg/L	0.040	0.006		W221300	AS	06/09/12 13:21	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0008		W221300	AS	06/09/12 13:21	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0007		W221300	AS	06/09/12 13:21	
EPA 200.7	Iron	0.181	mg/L	0.060	0.011		W221300	AS	06/09/12 13:21	
EPA 200.7	Magnesium	0.117	mg/L	0.060	0.013		W221300	AS	06/09/12 13:21	
EPA 200.7	Manganese	0.0442	mg/L	0.0040	0.0007		W221300	AS	06/09/12 13:21	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W221300	AS	06/09/12 13:21	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W221300	AS	06/09/12 13:21	
EPA 200.7	Potassium	0.83	mg/L	0.50	0.08		W221300	AS	06/09/12 13:21	
EPA 200.7	Silicon	10.5	mg/L	0.08	0.01		W221300	AS	06/09/12 13:21	
EPA 200.7	Sodium	9.99	mg/L	0.50	0.07		W221300	AS	06/09/12 13:21	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0002		W221300	AS	06/09/12 13:21	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0004		W221300	AS	06/09/12 13:21	
EPA 200.7	Zinc	0.0338	mg/L	0.0100	0.0013		W221300	AS	06/09/12 13:21	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W222010	DT	06/08/12 15:58	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W222010	DT	06/08/12 15:58	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000096	2.5	W222010	DT	06/08/12 15:58	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.00002	2.5	W222010	DT	06/08/12 15:58	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.00009	2.5	W222010	DT	06/08/12 15:58	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000072	2.5	W222010	DT	06/08/12 15:58	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W222010	DT	06/08/12 15:58	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.000018	2.5	W222010	DT	06/08/12 15:58	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000009	2.5	W222010	DT	06/08/12 15:58	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000010	2.5	W222010	DT	06/08/12 15:58	
SM 2340B	Hardness (as CaCO3)	1.24	mg/L	0.347	0.140		N/A		06/08/12 14:59	



Newmont - Surgold LLC
 Surinamestraat #54
 Paramaribo, SURINAME -

Project Name: Suriname - Merian Gold 2012
 Work Order: **W2E0651**
 Reported: 13-Jun-12 10:13

Client Sample ID: **16MAY12GW002**

SVL Sample ID: **W2E0651-03 (Ground Water)**

Sample Report Page 2 of 3

Sampled: 16-May-12 10:25
 Received: 23-May-12
 Sampled By: MA

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	0.105	mg/L	0.080	0.022		W221299	TJK	06/08/12 14:59	
EPA 200.7	Barium	0.0022	mg/L	0.0020	0.0006		W221299	TJK	06/08/12 14:59	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.014		W221299	TJK	06/08/12 14:59	
EPA 200.7	Calcium	0.321	mg/L	0.040	0.013		W221299	TJK	06/08/12 14:59	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0015		W221299	TJK	06/08/12 14:59	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0014		W221299	TJK	06/08/12 14:59	
EPA 200.7	Iron	0.112	mg/L	0.060	0.022		W221299	TJK	06/08/12 16:42	
EPA 200.7	Magnesium	0.105	mg/L	0.060	0.026		W221299	TJK	06/08/12 14:59	
EPA 200.7	Manganese	0.0291	mg/L	0.0040	0.0014		W221299	TJK	06/08/12 14:59	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.002		W221299	TJK	06/08/12 14:59	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.004		W221299	TJK	06/08/12 14:59	
EPA 200.7	Potassium	0.75	mg/L	0.50	0.16		W221299	TJK	06/08/12 14:59	
EPA 200.7	Silicon	10.5	mg/L	0.08	0.03		W221299	TJK	06/08/12 16:42	
EPA 200.7	Sodium	11.3	mg/L	0.50	0.14		W221299	TJK	06/08/12 14:59	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0004		W221299	TJK	06/08/12 14:59	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0007		W221299	TJK	06/08/12 14:59	
EPA 200.7	Zinc	0.0214	mg/L	0.0100	0.0026		W221299	TJK	06/08/12 14:59	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W222018	KWH	06/12/12 08:08	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W222018	KWH	06/12/12 08:08	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000077		W222018	KWH	06/12/12 08:08	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.000014		W222018	KWH	06/12/12 08:08	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.000072		W222018	KWH	06/13/12 08:27	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000058		W222018	KWH	06/12/12 08:08	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W222018	KWH	06/12/12 08:08	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.0000074		W222018	KWH	06/13/12 08:27	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000075		W222018	KWH	06/12/12 08:08	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000082		W222018	KWH	06/12/12 08:08	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000054		W223223	DJA	06/07/12 13:53	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0004		W222025	IIT	05/29/12 16:35	N3a
EPA 120.1	Specific conductance	47.6	µmhos/cm	5.00			W221316	RS	05/24/12 09:55	
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W222023	IIT	05/29/12 11:24	
EPA 350.1	Ammonia as N	0.070	mg/L	0.030	0.006		W223013	RHW	06/07/12 10:53	
EPA 353.2	Nitrate/Nitrite as N	0.204	mg/L	0.050	0.008		W223018	RHW	06/06/12 13:37	
SM 2320B/2310B	Bicarbonate	12.3	mg/L	1.0	0.1		W221360	AAS	05/30/12 08:09	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.1		W221360	AAS	05/30/12 08:09	
SM 2320B/2310B	Total Alkalinity	12.3	mg/L	1.0	0.1		W221360	AAS	05/30/12 08:09	
SM 2540 C	Total Diss. Solids	51	mg/L	10			W221321	RS	05/24/12 12:15	H1
SM 2540 D	Total Susp. Solids	< 5.0	mg/L	5.0			W221319	RS	05/24/12 12:15	H1
SM 4500 H B	pH @21.0°C	5.66	pH Units				W221360	AAS	05/30/12 08:09	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W221311	IIT	05/29/12 10:30	
SM 4500-P-E	Phosphorus	0.010	mg/L	0.010	0.005		W221383	CCM/S	05/25/12 12:57	



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Kellogg ID 83837-0929

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Newmont - Surgold LLC
Surinamestraat #54
Paramaribo, SURINAME -

Project Name: Suriname - Merian Gold 2012

Work Order: **W2E0651**

Reported: 13-Jun-12 10:13

Client Sample ID: **16MAY12GW002**

SVL Sample ID: **W2E0651-03 (Ground Water)**

Sample Report Page 3 of 3

Sampled: 16-May-12 10:25

Received: 23-May-12

Sampled By: MA

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	4.18	mg/L	0.20	0.03		W223310	AEW	06/07/12 22:03	
EPA 300.0	Fluoride	< 0.10	mg/L	0.10	0.02		W223310	AEW	06/07/12 22:03	
EPA 300.0	Sulfate as SO4	5.70	mg/L	0.30	0.05		W223310	AEW	06/07/12 22:03	

Cation/Anion Balance and TDS Ratios

Cation Sum: 0.50 meq/L Anion Sum: 0.50 meq/L C/A Balance: -0.10 % Calculated TDS: 58 TDS/cTDS: 0.87 TDS/eC: 1.07

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Newmont - Surgold LLC
 Surinamestraat #54
 Paramaribo, SURINAME -

Project Name: Suriname - Merian Gold 2012
 Work Order: **W2E0651**
 Reported: 13-Jun-12 10:13

Client Sample ID: **16MAY12GW003**

SVL Sample ID: **W2E0651-04 (Ground Water)**

Sample Report Page 1 of 3

Sampled: 16-May-12 11:17
 Received: 23-May-12
 Sampled By: MA

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000054		W223228	DJA	06/07/12 14:30	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.011		W221300	AS	06/09/12 13:27	
EPA 200.7	Barium	0.0095	mg/L	0.0020	0.0003		W221300	AS	06/09/12 13:27	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.007		W221300	AS	06/09/12 13:27	
EPA 200.7	Calcium	0.883	mg/L	0.040	0.006		W221300	AS	06/09/12 13:27	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0008		W221300	AS	06/09/12 13:27	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0007		W221300	AS	06/09/12 13:27	
EPA 200.7	Iron	< 0.060	mg/L	0.060	0.011		W221300	AS	06/09/12 13:27	
EPA 200.7	Magnesium	2.12	mg/L	0.060	0.013		W221300	AS	06/09/12 13:27	
EPA 200.7	Manganese	0.0330	mg/L	0.0040	0.0007		W221300	AS	06/09/12 13:27	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W221300	AS	06/09/12 13:27	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W221300	AS	06/09/12 13:27	
EPA 200.7	Potassium	< 0.50	mg/L	0.50	0.08		W221300	AS	06/09/12 13:27	
EPA 200.7	Silicon	8.70	mg/L	0.08	0.01		W221300	AS	06/09/12 13:27	
EPA 200.7	Sodium	3.73	mg/L	0.50	0.07		W221300	AS	06/09/12 13:27	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0002		W221300	AS	06/09/12 13:27	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0004		W221300	AS	06/09/12 13:27	
EPA 200.7	Zinc	0.0184	mg/L	0.0100	0.0013		W221300	AS	06/09/12 13:27	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W222010	DT	06/08/12 15:59	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W222010	DT	06/08/12 15:59	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000096	2.5	W222010	DT	06/08/12 15:59	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.00002	2.5	W222010	DT	06/08/12 15:59	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.00009	2.5	W222010	DT	06/08/12 15:59	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000072	2.5	W222010	DT	06/08/12 15:59	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W222010	DT	06/08/12 15:59	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.000018	2.5	W222010	DT	06/08/12 15:59	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000009	2.5	W222010	DT	06/08/12 15:59	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000010	2.5	W222010	DT	06/08/12 15:59	
SM 2340B	Hardness (as CaCO3)	10.4	mg/L	0.347	0.140		N/A		06/08/12 15:04	



Newmont - Surgold LLC
 Surinamestraat #54
 Paramaribo, SURINAME -

Project Name: Suriname - Merian Gold 2012
 Work Order: **W2E0651**
 Reported: 13-Jun-12 10:13

Client Sample ID: **16MAY12GW003**

SVL Sample ID: **W2E0651-04 (Ground Water)**

Sample Report Page 2 of 3

Sampled: 16-May-12 11:17
 Received: 23-May-12
 Sampled By: MA

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Dissolved)

EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.022		W221299	TJK	06/08/12 15:04	
EPA 200.7	Barium	0.0077	mg/L	0.0020	0.0006		W221299	TJK	06/08/12 15:04	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.014		W221299	TJK	06/08/12 15:04	
EPA 200.7	Calcium	0.900	mg/L	0.040	0.013		W221299	TJK	06/08/12 15:04	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0015		W221299	TJK	06/08/12 15:04	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0014		W221299	TJK	06/08/12 15:04	
EPA 200.7	Iron	< 0.060	mg/L	0.060	0.022		W221299	TJK	06/08/12 16:48	
EPA 200.7	Magnesium	1.99	mg/L	0.060	0.026		W221299	TJK	06/08/12 15:04	
EPA 200.7	Manganese	0.0293	mg/L	0.0040	0.0014		W221299	TJK	06/08/12 15:04	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.002		W221299	TJK	06/08/12 15:04	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.004		W221299	TJK	06/08/12 15:04	
EPA 200.7	Potassium	< 0.50	mg/L	0.50	0.16		W221299	TJK	06/08/12 15:04	
EPA 200.7	Silicon	8.30	mg/L	0.08	0.03		W221299	TJK	06/08/12 16:48	
EPA 200.7	Sodium	4.28	mg/L	0.50	0.14		W221299	TJK	06/08/12 15:04	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0004		W221299	TJK	06/08/12 15:04	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0007		W221299	TJK	06/08/12 15:04	
EPA 200.7	Zinc	0.0194	mg/L	0.0100	0.0026		W221299	TJK	06/08/12 15:04	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W222018	KWH	06/12/12 08:13	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W222018	KWH	06/12/12 08:13	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000077		W222018	KWH	06/12/12 08:13	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.000014		W222018	KWH	06/12/12 08:13	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.000072		W222018	KWH	06/13/12 08:28	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000058		W222018	KWH	06/12/12 08:13	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W222018	KWH	06/12/12 08:13	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.0000074		W222018	KWH	06/13/12 08:28	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000075		W222018	KWH	06/12/12 08:13	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000082		W222018	KWH	06/12/12 08:13	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000054		W223223	DJA	06/07/12 13:54	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0004		W222025	IIT	05/29/12 16:37	N3a
EPA 120.1	Specific conductance	60.0	µmhos/cm	5.00			W221316	RS	05/24/12 09:55	
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W222023	IIT	05/29/12 11:26	
EPA 350.1	Ammonia as N	0.031	mg/L	0.030	0.006		W223013	RHW	06/07/12 10:54	
EPA 353.2	Nitrate/Nitrite as N	0.134	mg/L	0.050	0.008		W223018	RHW	06/06/12 13:38	
SM 2320B/2310B	Bicarbonate	12.2	mg/L	1.0	0.1		W221360	AAS	05/30/12 08:15	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.1		W221360	AAS	05/30/12 08:15	
SM 2320B/2310B	Total Alkalinity	12.2	mg/L	1.0	0.1		W221360	AAS	05/30/12 08:15	
SM 2540 C	Total Diss. Solids	66	mg/L	10			W221321	RS	05/24/12 12:15	H1
SM 2540 D	Total Susp. Solids	< 5.0	mg/L	5.0			W221319	RS	05/24/12 12:15	H1
SM 4500 H B	pH @20.0°C	5.72	pH Units				W221360	AAS	05/30/12 08:15	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W221311	IIT	05/29/12 10:32	
SM 4500-P-E	Phosphorus	0.016	mg/L	0.010	0.005		W221383	CCM/S	05/25/12 12:57	



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Kellogg ID 83837-0929

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Newmont - Surgold LLC
Surinamestraat #54
Paramaribo, SURINAME -

Project Name: Suriname - Merian Gold 2012
Work Order: **W2E0651**
Reported: 13-Jun-12 10:13

Client Sample ID: **16MAY12GW003**

SVL Sample ID: **W2E0651-04 (Ground Water)**

Sample Report Page 3 of 3

Sampled: 16-May-12 11:17
Received: 23-May-12
Sampled By: MA

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	4.02	mg/L	0.20	0.03		W223310	AEW	06/07/12 22:34	
EPA 300.0	Fluoride	< 0.10	mg/L	0.10	0.02		W223310	AEW	06/07/12 22:34	
EPA 300.0	Sulfate as SO4	0.68	mg/L	0.30	0.05		W223310	AEW	06/07/12 22:34	

Cation/Anion Balance and TDS Ratios

Cation Sum: 0.38 meq/L Anion Sum: 0.38 meq/L C/A Balance: -0.59 % Calculated TDS: 43 TDS/cTDS: 1.55 TDS/eC: 1.10

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Newmont - Surgold LLC
Surinamestraat #54
Paramaribo, SURINAME -

Project Name: Suriname - Merian Gold 2012
Work Order: **W2E0651**
Reported: 13-Jun-12 10:13

Client Sample ID: **16MAY12GW004**

SVL Sample ID: **W2E0651-05 (Ground Water)**

Sample Report Page 1 of 3

Sampled: 16-May-12 15:00
Received: 23-May-12
Sampled By: MA

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000054		W223228	DJA	06/07/12 14:31	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.011		W221300	AS	06/09/12 13:33	
EPA 200.7	Barium	0.246	mg/L	0.0020	0.0003		W221300	AS	06/09/12 13:33	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.007		W221300	AS	06/09/12 13:33	
EPA 200.7	Calcium	27.2	mg/L	0.040	0.006		W221300	AS	06/09/12 13:33	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0008		W221300	AS	06/09/12 13:33	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0007		W221300	AS	06/09/12 13:33	
EPA 200.7	Iron	1.52	mg/L	0.060	0.011		W221300	AS	06/09/12 13:33	
EPA 200.7	Magnesium	8.25	mg/L	0.060	0.013		W221300	AS	06/09/12 13:33	
EPA 200.7	Manganese	3.13	mg/L	0.0040	0.0007		W221300	AS	06/09/12 13:33	
EPA 200.7	Molybdenum	0.009	mg/L	0.008	0.001		W221300	AS	06/09/12 13:33	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W221300	AS	06/09/12 13:33	
EPA 200.7	Potassium	0.89	mg/L	0.50	0.08		W221300	AS	06/09/12 13:33	
EPA 200.7	Silicon	16.2	mg/L	0.08	0.01		W221300	AS	06/09/12 13:33	
EPA 200.7	Sodium	26.2	mg/L	0.50	0.07		W221300	AS	06/09/12 13:33	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0002		W221300	AS	06/09/12 13:33	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0004		W221300	AS	06/09/12 13:33	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0013		W221300	AS	06/09/12 13:33	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W222010	DT	06/08/12 16:01	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W222010	DT	06/08/12 16:01	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000096	2.5	W222010	DT	06/08/12 16:01	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.00002	2.5	W222010	DT	06/08/12 16:01	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.00009	2.5	W222010	DT	06/08/12 16:01	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000072	2.5	W222010	DT	06/08/12 16:01	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W222010	DT	06/08/12 16:01	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.000018	2.5	W222010	DT	06/08/12 16:01	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000009	2.5	W222010	DT	06/08/12 16:01	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000010	2.5	W222010	DT	06/08/12 16:01	
SM 2340B	Hardness (as CaCO3)	98.0	mg/L	0.347	0.140		N/A		06/08/12 15:10	



Newmont - Surgold LLC
 Surinamestraat #54
 Paramaribo, SURINAME -

Project Name: Suriname - Merian Gold 2012
 Work Order: **W2E0651**
 Reported: 13-Jun-12 10:13

Client Sample ID: **16MAY12GW004**

SVL Sample ID: **W2E0651-05 (Ground Water)**

Sample Report Page 2 of 3

Sampled: 16-May-12 15:00
 Received: 23-May-12
 Sampled By: MA

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.022		W221299	TJK	06/08/12 15:10	
EPA 200.7	Barium	0.219	mg/L	0.0020	0.0006		W221299	TJK	06/08/12 15:10	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.014		W221299	TJK	06/08/12 15:10	
EPA 200.7	Calcium	26.2	mg/L	0.040	0.013		W221299	TJK	06/08/12 15:10	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0015		W221299	TJK	06/08/12 15:10	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0014		W221299	TJK	06/08/12 15:10	
EPA 200.7	Iron	1.47	mg/L	0.060	0.022		W221299	TJK	06/08/12 16:54	
EPA 200.7	Magnesium	7.93	mg/L	0.060	0.026		W221299	TJK	06/08/12 15:10	
EPA 200.7	Manganese	2.97	mg/L	0.0040	0.0014		W221299	TJK	06/08/12 15:10	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.002		W221299	TJK	06/08/12 15:10	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.004		W221299	TJK	06/08/12 15:10	
EPA 200.7	Potassium	0.93	mg/L	0.50	0.16		W221299	TJK	06/08/12 15:10	
EPA 200.7	Silicon	15.8	mg/L	0.08	0.03		W221299	TJK	06/08/12 16:54	
EPA 200.7	Sodium	30.1	mg/L	0.50	0.14		W221299	TJK	06/08/12 15:10	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0004		W221299	TJK	06/08/12 15:10	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0007		W221299	TJK	06/08/12 15:10	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0026		W221299	TJK	06/08/12 15:10	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W222018	KWH	06/12/12 08:17	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W222018	KWH	06/12/12 08:17	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000077		W222018	KWH	06/12/12 08:17	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.000014		W222018	KWH	06/12/12 08:17	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.000072		W222018	KWH	06/13/12 08:30	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000058		W222018	KWH	06/12/12 08:17	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W222018	KWH	06/12/12 08:17	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.0000074		W222018	KWH	06/13/12 08:30	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000075		W222018	KWH	06/12/12 08:17	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000082		W222018	KWH	06/12/12 08:17	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000054		W223223	DJA	06/07/12 13:56	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0004		W222025	IIT	05/29/12 16:39	N3a
EPA 120.1	Specific conductance	341	µmhos/cm	5.00			W221316	RS	05/24/12 09:55	
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W222023	IIT	05/29/12 11:28	
EPA 350.1	Ammonia as N	0.060	mg/L	0.030	0.006		W223013	RHW	06/07/12 10:55	
EPA 353.2	Nitrate/Nitrite as N	< 0.050	mg/L	0.050	0.008		W223018	RHW	06/06/12 13:40	
SM 2320B/2310B	Bicarbonate	164	mg/L	1.0	0.1		W221360	AAS	05/25/12 15:20	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.1		W221360	AAS	05/25/12 15:20	
SM 2320B/2310B	Total Alkalinity	164	mg/L	1.0	0.1		W221360	AAS	05/25/12 15:20	
SM 2540 C	Total Diss. Solids	188	mg/L	10			W221321	RS	05/24/12 12:15	H1
SM 2540 D	Total Susp. Solids	< 5.0	mg/L	5.0			W221319	RS	05/24/12 12:15	H1
SM 4500 H B	pH @21.0°C	7.75	pH Units				W221360	AAS	05/25/12 15:20	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W221311	IIT	05/29/12 10:34	
SM 4500-P-E	Phosphorus	0.028	mg/L	0.010	0.005		W221383	CCM/S	05/25/12 12:57	



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Kellogg ID 83837-0929

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Newmont - Surgold LLC
Surinamestraat #54
Paramaribo, SURINAME -

Project Name: Suriname - Merian Gold 2012
Work Order: **W2E0651**
Reported: 13-Jun-12 10:13

Client Sample ID: **16MAY12GW004**

SVL Sample ID: **W2E0651-05 (Ground Water)**

Sample Report Page 3 of 3

Sampled: 16-May-12 15:00
Received: 23-May-12
Sampled By: MA

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	6.54	mg/L	0.20	0.03		W223310	AEW	06/07/12 22:45	
EPA 300.0	Fluoride	0.12	mg/L	0.10	0.02		W223310	AEW	06/07/12 22:45	
EPA 300.0	Sulfate as SO4	0.59	mg/L	0.30	0.05		W223310	AEW	06/07/12 22:45	

Cation/Anion Balance and TDS Ratios

Cation Sum: 3.29 meq/L Anion Sum: 3.48 meq/L C/A Balance: -2.78 % Calculated TDS: 213 TDS/cTDS: 0.88 TDS/eC: 0.55

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Newmont - Surgold LLC
 Surinamestraat #54
 Paramaribo, SURINAME -

Project Name: Suriname - Merian Gold 2012
 Work Order: **W2E0651**
 Reported: 13-Jun-12 10:13

Client Sample ID: **17MAY12GW005**

SVL Sample ID: **W2E0651-06 (Ground Water)**

Sample Report Page 1 of 3

Sampled: 17-May-12 15:07
 Received: 23-May-12
 Sampled By: MA

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000054		W223228	DJA	06/07/12 14:33	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.011		W221300	AS	06/09/12 13:39	
EPA 200.7	Barium	0.0375	mg/L	0.0020	0.0003		W221300	AS	06/09/12 13:39	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.007		W221300	AS	06/09/12 13:39	
EPA 200.7	Calcium	34.3	mg/L	0.040	0.006		W221300	AS	06/09/12 13:39	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0008		W221300	AS	06/09/12 13:39	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0007		W221300	AS	06/09/12 13:39	
EPA 200.7	Iron	0.510	mg/L	0.060	0.011		W221300	AS	06/09/12 13:39	
EPA 200.7	Magnesium	14.3	mg/L	0.060	0.013		W221300	AS	06/09/12 13:39	
EPA 200.7	Manganese	1.03	mg/L	0.0040	0.0007		W221300	AS	06/09/12 13:39	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W221300	AS	06/09/12 13:39	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W221300	AS	06/09/12 13:39	
EPA 200.7	Potassium	2.52	mg/L	0.50	0.08		W221300	AS	06/09/12 13:39	
EPA 200.7	Silicon	18.5	mg/L	0.08	0.01		W221300	AS	06/09/12 13:39	
EPA 200.7	Sodium	36.8	mg/L	0.50	0.07		W221300	AS	06/09/12 13:39	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0002		W221300	AS	06/09/12 13:39	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0004		W221300	AS	06/09/12 13:39	
EPA 200.7	Zinc	0.0247	mg/L	0.0100	0.0013		W221300	AS	06/09/12 13:39	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W222010	DT	06/08/12 16:03	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W222010	DT	06/08/12 16:03	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000096	2.5	W222010	DT	06/08/12 16:03	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.00002	2.5	W222010	DT	06/08/12 16:03	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.00009	2.5	W222010	DT	06/08/12 16:03	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000072	2.5	W222010	DT	06/08/12 16:03	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W222010	DT	06/08/12 16:03	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.000018	2.5	W222010	DT	06/08/12 16:03	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000009	2.5	W222010	DT	06/08/12 16:03	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000010	2.5	W222010	DT	06/08/12 16:03	
SM 2340B	Hardness (as CaCO3)	139	mg/L	0.347	0.140		N/A		06/08/12 15:15	



Newmont - Surgold LLC
 Surinamestraat #54
 Paramaribo, SURINAME -

Project Name: Suriname - Merian Gold 2012
 Work Order: **W2E0651**
 Reported: 13-Jun-12 10:13

Client Sample ID: **17MAY12GW005**

SVL Sample ID: **W2E0651-06 (Ground Water)**

Sample Report Page 2 of 3

Sampled: 17-May-12 15:07
 Received: 23-May-12
 Sampled By: MA

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Dissolved)

EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.022		W221299	TJK	06/08/12 15:15	
EPA 200.7	Barium	0.0338	mg/L	0.0020	0.0006		W221299	TJK	06/08/12 15:15	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.014		W221299	TJK	06/08/12 15:15	
EPA 200.7	Calcium	33.1	mg/L	0.040	0.013		W221299	TJK	06/08/12 15:15	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0015		W221299	TJK	06/08/12 15:15	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0014		W221299	TJK	06/08/12 15:15	
EPA 200.7	Iron	0.491	mg/L	0.060	0.022		W221299	TJK	06/08/12 17:00	
EPA 200.7	Magnesium	13.7	mg/L	0.060	0.026		W221299	TJK	06/08/12 15:15	
EPA 200.7	Manganese	0.991	mg/L	0.0040	0.0014		W221299	TJK	06/08/12 15:15	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.002		W221299	TJK	06/08/12 15:15	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.004		W221299	TJK	06/08/12 15:15	
EPA 200.7	Potassium	2.55	mg/L	0.50	0.16		W221299	TJK	06/08/12 15:15	
EPA 200.7	Silicon	18.0	mg/L	0.08	0.03		W221299	TJK	06/08/12 17:00	
EPA 200.7	Sodium	42.4	mg/L	0.50	0.14		W221299	TJK	06/08/12 15:15	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0004		W221299	TJK	06/08/12 15:15	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0007		W221299	TJK	06/08/12 15:15	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0026		W221299	TJK	06/08/12 15:15	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W222018	KWH	06/12/12 08:22	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W222018	KWH	06/12/12 08:22	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000077		W222018	KWH	06/12/12 08:22	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.000014		W222018	KWH	06/12/12 08:22	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.000072		W222018	KWH	06/13/12 08:31	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000058		W222018	KWH	06/12/12 08:22	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W222018	KWH	06/12/12 08:22	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.0000074		W222018	KWH	06/13/12 08:31	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000075		W222018	KWH	06/12/12 08:22	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000082		W222018	KWH	06/12/12 08:22	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000054		W223223	DJA	06/07/12 13:58	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0004		W222025	IIT	05/31/12 16:16	N3a
EPA 120.1	Specific conductance	470	µmhos/cm	5.00			W221316	RS	05/24/12 09:55	
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W222023	IIT	05/30/12 11:46	
EPA 350.1	Ammonia as N	0.276	mg/L	0.030	0.006		W223013	RHW	06/07/12 10:57	
EPA 353.2	Nitrate/Nitrite as N	< 0.050	mg/L	0.050	0.008		W223018	RHW	06/06/12 13:41	
SM 2320B/2310B	Bicarbonate	218	mg/L	1.0	0.1		W221360	AAS	05/25/12 15:27	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.1		W221360	AAS	05/25/12 15:27	
SM 2320B/2310B	Total Alkalinity	218	mg/L	1.0	0.1		W221360	AAS	05/25/12 15:27	
SM 2540 C	Total Diss. Solids	276	mg/L	10			W221321	RS	05/24/12 12:15	
SM 2540 D	Total Susp. Solids	< 5.0	mg/L	5.0			W221319	RS	05/24/12 12:15	
SM 4500 H B	pH @21.0°C	7.99	pH Units				W221360	AAS	05/25/12 15:27	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W221311	IIT	05/29/12 10:36	
SM 4500-P-E	Phosphorus	0.032	mg/L	0.010	0.005		W221383	CCM/S	05/25/12 12:57	



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Newmont - Surgold LLC
Surinamestraat #54
Paramaribo, SURINAME -

Project Name: Suriname - Merian Gold 2012
Work Order: **W2E0651**
Reported: 13-Jun-12 10:13

Client Sample ID: **17MAY12GW005**

SVL Sample ID: **W2E0651-06 (Ground Water)**

Sample Report Page 3 of 3

Sampled: 17-May-12 15:07
Received: 23-May-12
Sampled By: MA

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	8.87	mg/L	0.20	0.03		W223310	AEW	06/07/12 23:05	
EPA 300.0	Fluoride	0.23	mg/L	0.10	0.02		W223310	AEW	06/07/12 23:05	
EPA 300.0	Sulfate as SO4	4.98	mg/L	0.30	0.05		W223310	AEW	06/07/12 23:05	

Cation/Anion Balance and TDS Ratios

Cation Sum: 4.52 meq/L Anion Sum: 4.72 meq/L C/A Balance: -2.19 % Calculated TDS: 284 TDS/cTDS: 0.97 TDS/eC: 0.59

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Newmont - Surgold LLC
 Surinamestraat #54
 Paramaribo, SURINAME -

Project Name: Suriname - Merian Gold 2012
 Work Order: **W2E0651**
 Reported: 13-Jun-12 10:13

Client Sample ID: **18MAY12GW006**

SVL Sample ID: **W2E0651-07 (Ground Water)**

Sample Report Page 1 of 3

Sampled: 18-May-12 10:45
 Received: 23-May-12
 Sampled By: MA

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000054		W223228	DJA	06/07/12 14:34	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	5.73	mg/L	0.080	0.011		W221300	AS	06/09/12 13:57	
EPA 200.7	Barium	0.0433	mg/L	0.0020	0.0003		W221300	AS	06/09/12 13:57	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.007		W221300	AS	06/09/12 13:57	
EPA 200.7	Calcium	4.22	mg/L	0.040	0.006		W221300	AS	06/09/12 13:57	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0008		W221300	AS	06/09/12 13:57	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0007		W221300	AS	06/09/12 13:57	
EPA 200.7	Iron	3.39	mg/L	0.060	0.011		W221300	AS	06/09/12 13:57	
EPA 200.7	Magnesium	1.80	mg/L	0.060	0.013		W221300	AS	06/09/12 13:57	
EPA 200.7	Manganese	0.206	mg/L	0.0040	0.0007		W221300	AS	06/09/12 13:57	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W221300	AS	06/09/12 13:57	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W221300	AS	06/09/12 13:57	
EPA 200.7	Potassium	1.74	mg/L	0.50	0.08		W221300	AS	06/09/12 13:57	
EPA 200.7	Silicon	20.9	mg/L	0.08	0.01		W221300	AS	06/09/12 13:57	
EPA 200.7	Sodium	28.5	mg/L	0.50	0.07		W221300	AS	06/09/12 13:57	
EPA 200.7	Titanium	0.0127	mg/L	0.0050	0.0002		W221300	AS	06/09/12 13:57	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0004		W221300	AS	06/09/12 13:57	
EPA 200.7	Zinc	0.0783	mg/L	0.0100	0.0013		W221300	AS	06/09/12 13:57	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W222010	DT	06/08/12 16:08	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W222010	DT	06/08/12 16:08	
EPA 200.8	Beryllium	0.000782	mg/L	0.000200	0.000096	2.5	W222010	DT	06/08/12 16:08	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.00002	2.5	W222010	DT	06/08/12 16:08	
EPA 200.8	Copper	0.00380	mg/L	0.00100	0.00009	2.5	W222010	DT	06/08/12 16:08	
EPA 200.8	Lead	0.00536	mg/L	0.00300	0.000072	2.5	W222010	DT	06/08/12 16:08	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W222010	DT	06/08/12 16:08	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.000018	2.5	W222010	DT	06/08/12 16:08	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000009	2.5	W222010	DT	06/08/12 16:08	
EPA 200.8	Uranium	0.00192	mg/L	0.00100	0.000010	2.5	W222010	DT	06/08/12 16:08	
SM 2340B	Hardness (as CaCO3)	4.53	mg/L	0.347	0.140		N/A		06/08/12 15:31	



Newmont - Surgold LLC
 Surinamestraat #54
 Paramaribo, SURINAME -

Project Name: Suriname - Merian Gold 2012
 Work Order: **W2E0651**
 Reported: 13-Jun-12 10:13

Client Sample ID: **18MAY12GW006**

SVL Sample ID: **W2E0651-07 (Ground Water)**

Sample Report Page 2 of 3

Sampled: 18-May-12 10:45
 Received: 23-May-12
 Sampled By: MA

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Dissolved)

EPA 200.7	Aluminum	0.093	mg/L	0.080	0.022		W221299	TJK	06/08/12 15:31	
EPA 200.7	Barium	0.0063	mg/L	0.0020	0.0006		W221299	TJK	06/08/12 15:31	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.014		W221299	TJK	06/08/12 15:31	
EPA 200.7	Calcium	1.37	mg/L	0.040	0.013		W221299	TJK	06/08/12 15:31	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0015		W221299	TJK	06/08/12 15:31	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0014		W221299	TJK	06/08/12 15:31	
EPA 200.7	Iron	0.488	mg/L	0.060	0.022		W221299	TJK	06/08/12 17:18	
EPA 200.7	Magnesium	0.271	mg/L	0.060	0.026		W221299	TJK	06/08/12 15:31	
EPA 200.7	Manganese	0.0619	mg/L	0.0040	0.0014		W221299	TJK	06/08/12 15:31	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.002		W221299	TJK	06/08/12 15:31	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.004		W221299	TJK	06/08/12 15:31	
EPA 200.7	Potassium	1.23	mg/L	0.50	0.16		W221299	TJK	06/08/12 15:31	
EPA 200.7	Silicon	7.68	mg/L	0.08	0.03		W221299	TJK	06/08/12 17:18	
EPA 200.7	Sodium	31.7	mg/L	0.50	0.14		W221299	TJK	06/08/12 15:31	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0004		W221299	TJK	06/08/12 15:31	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0007		W221299	TJK	06/08/12 15:31	
EPA 200.7	Zinc	0.0172	mg/L	0.0100	0.0026		W221299	TJK	06/08/12 15:31	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W222018	KWH	06/12/12 08:45	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W222018	KWH	06/12/12 08:45	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000077		W222018	KWH	06/12/12 08:45	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.000014		W222018	KWH	06/12/12 08:45	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.000072		W222018	KWH	06/13/12 08:38	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000058		W222018	KWH	06/12/12 08:45	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W222018	KWH	06/12/12 08:45	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.0000074		W222018	KWH	06/13/12 08:38	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000075		W222018	KWH	06/12/12 08:45	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000082		W222018	KWH	06/12/12 08:45	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000054		W223223	DJA	06/07/12 13:59	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0004		W222025	IIT	05/31/12 14:26	
EPA 120.1	Specific conductance	151	µmhos/cm	5.00			W221316	RS	05/24/12 09:55	
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W222023	IIT	05/30/12 11:48	
EPA 350.1	Ammonia as N	0.396	mg/L	0.030	0.006		W223013	RHW	06/07/12 10:58	
EPA 353.2	Nitrate/Nitrite as N	< 0.050	mg/L	0.050	0.008		W223018	RHW	06/06/12 13:43	
SM 2320B/2310B	Bicarbonate	54.3	mg/L	1.0	0.1		W221360	AAS	05/25/12 15:34	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.1		W221360	AAS	05/25/12 15:34	
SM 2320B/2310B	Total Alkalinity	54.3	mg/L	1.0	0.1		W221360	AAS	05/25/12 15:34	
SM 2540 C	Total Diss. Solids	108	mg/L	40			W221321	RS	05/24/12 12:15	
SM 2540 D	Total Susp. Solids	340	mg/L	20.0			W221319	RS	05/24/12 12:15	N3
SM 4500 H B	pH @21.0°C	6.96	pH Units				W221360	AAS	05/25/12 15:34	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W221311	IIT	05/29/12 10:44	
SM 4500-P-E	Phosphorus	0.047	mg/L	0.010	0.005		W221383	CCM/S	05/25/12 12:57	Q14



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Newmont - Surgold LLC
Surinamestraat #54
Paramaribo, SURINAME -

Project Name: Suriname - Merian Gold 2012

Work Order: **W2E0651**

Reported: 13-Jun-12 10:13

Client Sample ID: **18MAY12GW006**

SVL Sample ID: **W2E0651-07 (Ground Water)**

Sample Report Page 3 of 3

Sampled: 18-May-12 10:45

Received: 23-May-12

Sampled By: MA

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	5.19	mg/L	0.20	0.03		W223310	AEW	06/07/12 23:26	
EPA 300.0	Fluoride	0.15	mg/L	0.10	0.02		W223310	AEW	06/07/12 23:26	
EPA 300.0	Sulfate as SO4	9.34	mg/L	0.30	0.05		W223310	AEW	06/07/12 23:26	

Cation/Anion Balance and TDS Ratios

Cation Sum: 1.42 meq/L Anion Sum: 1.43 meq/L C/A Balance: -0.48 % Calculated TDS: 121 TDS/cTDS: 0.89 TDS/eC: 0.72

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Newmont - Surgold LLC
Surinamestraat #54
Paramaribo, SURINAME -

Project Name: Suriname - Merian Gold 2012
Work Order: **W2E0651**
Reported: 13-Jun-12 10:13

Client Sample ID: **18MAY12GW007**

SVL Sample ID: **W2E0651-08 (Ground Water)**

Sample Report Page 1 of 3

Sampled: 18-May-12 13:05
Received: 23-May-12
Sampled By: MA

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000054		W223228	DJA	06/07/12 14:36	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	1.50	mg/L	0.080	0.011		W221300	AS	06/09/12 14:03	
EPA 200.7	Barium	0.0200	mg/L	0.0020	0.0003		W221300	AS	06/09/12 14:03	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.007		W221300	AS	06/09/12 14:03	
EPA 200.7	Calcium	4.24	mg/L	0.040	0.006		W221300	AS	06/09/12 14:03	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0008		W221300	AS	06/09/12 14:03	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0007		W221300	AS	06/09/12 14:03	
EPA 200.7	Iron	2.49	mg/L	0.060	0.011		W221300	AS	06/09/12 14:03	
EPA 200.7	Magnesium	8.05	mg/L	0.060	0.013		W221300	AS	06/09/12 14:03	
EPA 200.7	Manganese	0.180	mg/L	0.0040	0.0007		W221300	AS	06/09/12 14:03	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W221300	AS	06/09/12 14:03	
EPA 200.7	Nickel	0.010	mg/L	0.010	0.002		W221300	AS	06/09/12 14:03	
EPA 200.7	Potassium	1.18	mg/L	0.50	0.08		W221300	AS	06/09/12 14:03	
EPA 200.7	Silicon	25.8	mg/L	0.08	0.01		W221300	AS	06/09/12 14:03	
EPA 200.7	Sodium	20.9	mg/L	0.50	0.07		W221300	AS	06/09/12 14:03	
EPA 200.7	Titanium	0.0057	mg/L	0.0050	0.0002		W221300	AS	06/09/12 14:03	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0004		W221300	AS	06/09/12 14:03	
EPA 200.7	Zinc	0.0263	mg/L	0.0100	0.0013		W221300	AS	06/09/12 14:03	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W222010	DT	06/08/12 16:10	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W222010	DT	06/08/12 16:10	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000096	2.5	W222010	DT	06/08/12 16:10	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.00002	2.5	W222010	DT	06/08/12 16:10	
EPA 200.8	Copper	0.00304	mg/L	0.00100	0.00009	2.5	W222010	DT	06/08/12 16:10	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000072	2.5	W222010	DT	06/08/12 16:10	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W222010	DT	06/08/12 16:10	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.000018	2.5	W222010	DT	06/08/12 16:10	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000009	2.5	W222010	DT	06/08/12 16:10	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000010	2.5	W222010	DT	06/08/12 16:10	
SM 2340B	Hardness (as CaCO3)	37.4	mg/L	0.347	0.140		N/A		06/08/12 15:36	



Newmont - Surgold LLC
 Surinamestraat #54
 Paramaribo, SURINAME -

Project Name: Suriname - Merian Gold 2012
 Work Order: **W2E0651**
 Reported: 13-Jun-12 10:13

Client Sample ID: **18MAY12GW007**

SVL Sample ID: **W2E0651-08 (Ground Water)**

Sample Report Page 2 of 3

Sampled: 18-May-12 13:05
 Received: 23-May-12
 Sampled By: MA

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.022		W221299	TJK	06/08/12 15:36	
EPA 200.7	Barium	0.0128	mg/L	0.0020	0.0006		W221299	TJK	06/08/12 15:36	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.014		W221299	TJK	06/08/12 15:36	
EPA 200.7	Calcium	3.89	mg/L	0.040	0.013		W221299	TJK	06/08/12 15:36	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0015		W221299	TJK	06/08/12 15:36	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0014		W221299	TJK	06/08/12 15:36	
EPA 200.7	Iron	0.563	mg/L	0.060	0.022		W221299	TJK	06/08/12 17:24	
EPA 200.7	Magnesium	6.73	mg/L	0.060	0.026		W221299	TJK	06/08/12 15:36	
EPA 200.7	Manganese	0.145	mg/L	0.0040	0.0014		W221299	TJK	06/08/12 15:36	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.002		W221299	TJK	06/08/12 15:36	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.004		W221299	TJK	06/08/12 15:36	
EPA 200.7	Potassium	1.16	mg/L	0.50	0.16		W221299	TJK	06/08/12 15:36	
EPA 200.7	Silicon	23.1	mg/L	0.08	0.03		W221299	TJK	06/08/12 17:24	
EPA 200.7	Sodium	24.4	mg/L	0.50	0.14		W221299	TJK	06/08/12 15:36	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0004		W221299	TJK	06/08/12 15:36	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0007		W221299	TJK	06/08/12 15:36	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0026		W221299	TJK	06/08/12 15:36	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W222018	KWH	06/12/12 08:49	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W222018	KWH	06/12/12 08:49	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000077		W222018	KWH	06/12/12 08:49	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.000014		W222018	KWH	06/12/12 08:49	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.000072		W222018	KWH	06/13/12 08:39	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000058		W222018	KWH	06/12/12 08:49	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W222018	KWH	06/12/12 08:49	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.0000074		W222018	KWH	06/13/12 08:39	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000075		W222018	KWH	06/12/12 08:49	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000082		W222018	KWH	06/12/12 08:49	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000054		W223223	DJA	06/07/12 14:01	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0004		W222025	IIT	05/31/12 14:28	
EPA 120.1	Specific conductance	188	µmhos/cm	5.00			W221316	RS	05/24/12 09:55	
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W222023	IIT	05/30/12 11:50	
EPA 350.1	Ammonia as N	0.125	mg/L	0.030	0.006		W223013	RHW	06/07/12 10:59	
EPA 353.2	Nitrate/Nitrite as N	< 0.050	mg/L	0.050	0.008		W223018	RHW	06/06/12 13:44	
SM 2320B/2310B	Bicarbonate	69.6	mg/L	1.0	0.1		W221360	AAS	05/25/12 15:40	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.1		W221360	AAS	05/25/12 15:40	
SM 2320B/2310B	Total Alkalinity	69.6	mg/L	1.0	0.1		W221360	AAS	05/25/12 15:40	
SM 2540 C	Total Diss. Solids	137	mg/L	10			W221321	RS	05/24/12 12:15	
SM 2540 D	Total Susp. Solids	107	mg/L	5.0			W221319	RS	05/24/12 12:15	
SM 4500 H B	pH @21.0°C	6.96	pH Units				W221360	AAS	05/25/12 15:40	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W221311	IIT	05/29/12 10:46	
SM 4500-P-E	Phosphorus	0.216	mg/L	0.010	0.005		W221383	CCM/S	05/25/12 12:57	



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Newmont - Surgold LLC
Surinamestraat #54
Paramaribo, SURINAME -

Project Name: Suriname - Merian Gold 2012
Work Order: **W2E0651**
Reported: 13-Jun-12 10:13

Client Sample ID: **18MAY12GW007**

SVL Sample ID: **W2E0651-08 (Ground Water)**

Sample Report Page 3 of 3

Sampled: 18-May-12 13:05
Received: 23-May-12
Sampled By: MA

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	7.13	mg/L	0.20	0.03		W223310	AEW	06/07/12 23:37	
EPA 300.0	Fluoride	0.13	mg/L	0.10	0.02		W223310	AEW	06/07/12 23:37	
EPA 300.0	Sulfate as SO4	9.16	mg/L	0.30	0.05		W223310	AEW	06/07/12 23:37	

Cation/Anion Balance and TDS Ratios

Cation Sum: 1.72 meq/L Anion Sum: 1.79 meq/L C/A Balance: -1.88 % Calculated TDS: 160 TDS/cTDS: 0.86 TDS/eC: 0.73

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Newmont - Surgold LLC
 Surinamestraat #54
 Paramaribo, SURINAME -

Project Name: Suriname - Merian Gold 2012
 Work Order: **W2E0651**
 Reported: 13-Jun-12 10:13

Client Sample ID: **19MAY12GW008**

SVL Sample ID: **W2E0651-09 (Ground Water)**

Sample Report Page 1 of 3

Sampled: 19-May-12 10:30
 Received: 23-May-12
 Sampled By: MA

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000054		W223228	DJA	06/07/12 14:38	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.011		W221300	AS	06/09/12 14:09	
EPA 200.7	Barium	0.165	mg/L	0.0020	0.0003		W221300	AS	06/09/12 14:09	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.007		W221300	AS	06/09/12 14:09	
EPA 200.7	Calcium	41.7	mg/L	0.040	0.006		W221300	AS	06/09/12 14:09	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0008		W221300	AS	06/09/12 14:09	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0007		W221300	AS	06/09/12 14:09	
EPA 200.7	Iron	0.764	mg/L	0.060	0.011		W221300	AS	06/09/12 14:09	
EPA 200.7	Magnesium	18.8	mg/L	0.060	0.013		W221300	AS	06/09/12 14:09	
EPA 200.7	Manganese	1.00	mg/L	0.0040	0.0007		W221300	AS	06/09/12 14:09	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W221300	AS	06/09/12 14:09	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W221300	AS	06/09/12 14:09	
EPA 200.7	Potassium	0.79	mg/L	0.50	0.08		W221300	AS	06/09/12 14:09	
EPA 200.7	Silicon	23.0	mg/L	0.08	0.01		W221300	AS	06/09/12 14:09	
EPA 200.7	Sodium	21.9	mg/L	0.50	0.07		W221300	AS	06/09/12 14:09	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0002		W221300	AS	06/09/12 14:09	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0004		W221300	AS	06/09/12 14:09	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0013		W221300	AS	06/09/12 14:09	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W222010	DT	06/08/12 16:12	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W222010	DT	06/08/12 16:12	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000096	2.5	W222010	DT	06/08/12 16:12	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.00002	2.5	W222010	DT	06/08/12 16:12	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.00009	2.5	W222010	DT	06/08/12 16:12	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000072	2.5	W222010	DT	06/08/12 16:12	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W222010	DT	06/08/12 16:12	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.000018	2.5	W222010	DT	06/08/12 16:12	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000009	2.5	W222010	DT	06/08/12 16:12	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000010	2.5	W222010	DT	06/08/12 16:12	
SM 2340B	Hardness (as CaCO3)	170	mg/L	0.347	0.140		N/A		06/08/12 15:42	



Newmont - Surgold LLC
Surinamestraat #54
Paramaribo, SURINAME -

Project Name: Suriname - Merian Gold 2012
Work Order: W2E0651
Reported: 13-Jun-12 10:13

Client Sample ID: 19MAY12GW008

SVL Sample ID: W2E0651-09 (Ground Water)

Sample Report Page 2 of 3

Sampled: 19-May-12 10:30
Received: 23-May-12
Sampled By: MA

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.022		W221299	TJK	06/08/12 15:42	
EPA 200.7	Barium	0.146	mg/L	0.0020	0.0006		W221299	TJK	06/08/12 15:42	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.014		W221299	TJK	06/08/12 15:42	
EPA 200.7	Calcium	39.5	mg/L	0.040	0.013		W221299	TJK	06/08/12 15:42	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0015		W221299	TJK	06/08/12 15:42	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0014		W221299	TJK	06/08/12 15:42	
EPA 200.7	Iron	0.736	mg/L	0.060	0.022		W221299	DT	06/09/12 09:43	
EPA 200.7	Magnesium	17.4	mg/L	0.060	0.026		W221299	TJK	06/08/12 15:42	
EPA 200.7	Manganese	0.952	mg/L	0.0040	0.0014		W221299	TJK	06/08/12 15:42	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.002		W221299	TJK	06/08/12 15:42	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.004		W221299	TJK	06/08/12 15:42	
EPA 200.7	Potassium	0.81	mg/L	0.50	0.16		W221299	TJK	06/08/12 15:42	
EPA 200.7	Silicon	22.0	mg/L	0.08	0.03		W221299	DT	06/09/12 09:43	
EPA 200.7	Sodium	25.2	mg/L	0.50	0.14		W221299	TJK	06/08/12 15:42	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0004		W221299	TJK	06/08/12 15:42	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0007		W221299	TJK	06/08/12 15:42	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0026		W221299	TJK	06/08/12 15:42	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W222018	KWH	06/12/12 08:54	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W222018	KWH	06/12/12 08:54	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000077		W222018	KWH	06/12/12 08:54	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.000014		W222018	KWH	06/12/12 08:54	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.000072		W222018	KWH	06/13/12 08:41	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000058		W222018	KWH	06/12/12 08:54	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W222018	KWH	06/12/12 08:54	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.0000074		W222018	KWH	06/13/12 08:41	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000075		W222018	KWH	06/12/12 08:54	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000082		W222018	KWH	06/12/12 08:54	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000054		W223223	DJA	06/07/12 14:03	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0004		W222025	IIT	05/31/12 14:30	
EPA 120.1	Specific conductance	474	µmhos/cm	5.00			W221316	RS	05/24/12 09:55	
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W222023	IIT	05/30/12 11:52	
EPA 350.1	Ammonia as N	< 0.030	mg/L	0.030	0.006		W223013	RHW	06/07/12 11:01	
EPA 353.2	Nitrate/Nitrite as N	< 0.050	mg/L	0.050	0.008		W223018	RHW	06/06/12 13:45	
SM 2320B/2310B	Bicarbonate	226	mg/L	1.0	0.1		W221360	AAS	05/25/12 15:46	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.1		W221360	AAS	05/25/12 15:46	
SM 2320B/2310B	Total Alkalinity	226	mg/L	1.0	0.1		W221360	AAS	05/25/12 15:46	
SM 2540 C	Total Diss. Solids	275	mg/L	10			W221321	RS	05/24/12 12:15	
SM 2540 D	Total Susp. Solids	< 5.0	mg/L	5.0			W221319	RS	05/24/12 12:15	
SM 4500 H B	pH @21.0°C	7.86	pH Units				W221360	AAS	05/25/12 15:46	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W221311	IIT	05/29/12 10:48	
SM 4500-P-E	Phosphorus	0.034	mg/L	0.010	0.005		W221383	CCM/S	05/25/12 12:57	



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Newmont - Surgold LLC
Surinamestraat #54
Paramaribo, SURINAME -

Project Name: Suriname - Merian Gold 2012

Work Order: **W2E0651**

Reported: 13-Jun-12 10:13

Client Sample ID: **19MAY12GW008**

SVL Sample ID: **W2E0651-09 (Ground Water)**

Sample Report Page 3 of 3

Sampled: 19-May-12 10:30

Received: 23-May-12

Sampled By: MA

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	5.06	mg/L	0.20	0.03		W223310	AEW	06/08/12 00:08	
EPA 300.0	Fluoride	0.16	mg/L	0.10	0.02		W223310	AEW	06/08/12 00:08	
EPA 300.0	Sulfate as SO4	1.11	mg/L	0.30	0.05		W223310	AEW	06/08/12 00:08	

Cation/Anion Balance and TDS Ratios

Cation Sum: 4.44 meq/L Anion Sum: 4.69 meq/L C/A Balance: -2.73 % Calculated TDS: 286 TDS/cTDS: 0.96 TDS/eC: 0.58

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Newmont - Surgold LLC
Surinamestraat #54
Paramaribo, SURINAME -

Project Name: Suriname - Merian Gold 2012
Work Order: **W2E0651**
Reported: 13-Jun-12 10:13

Client Sample ID: **19MAY12GW009**

SVL Sample ID: **W2E0651-10 (Ground Water)**

Sample Report Page 1 of 3

Sampled: 19-May-12 12:30
Received: 23-May-12
Sampled By: MA

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000054		W223228	DJA	06/07/12 14:41	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.011		W221300	AS	06/09/12 14:15	
EPA 200.7	Barium	0.0293	mg/L	0.0020	0.0003		W221300	AS	06/09/12 14:15	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.007		W221300	AS	06/09/12 14:15	
EPA 200.7	Calcium	33.2	mg/L	0.040	0.006		W221300	AS	06/09/12 14:15	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0008		W221300	AS	06/09/12 14:15	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0007		W221300	AS	06/09/12 14:15	
EPA 200.7	Iron	0.647	mg/L	0.060	0.011		W221300	AS	06/09/12 14:15	
EPA 200.7	Magnesium	17.9	mg/L	0.060	0.013		W221300	AS	06/09/12 14:15	
EPA 200.7	Manganese	0.707	mg/L	0.0040	0.0007		W221300	AS	06/09/12 14:15	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.001		W221300	AS	06/09/12 14:15	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.002		W221300	AS	06/09/12 14:15	
EPA 200.7	Potassium	0.76	mg/L	0.50	0.08		W221300	AS	06/09/12 14:15	
EPA 200.7	Silicon	31.7	mg/L	0.08	0.01		W221300	AS	06/09/12 14:15	
EPA 200.7	Sodium	21.2	mg/L	0.50	0.07		W221300	AS	06/09/12 14:15	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0002		W221300	AS	06/09/12 14:15	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0004		W221300	AS	06/09/12 14:15	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0013		W221300	AS	06/09/12 14:15	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W222010	DT	06/08/12 16:14	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W222010	DT	06/08/12 16:14	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000096	2.5	W222010	DT	06/08/12 16:14	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.00002	2.5	W222010	DT	06/08/12 16:14	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.00009	2.5	W222010	DT	06/08/12 16:14	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000072	2.5	W222010	DT	06/08/12 16:14	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00028	2.5	W222010	DT	06/08/12 16:14	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.000018	2.5	W222010	DT	06/08/12 16:14	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.000009	2.5	W222010	DT	06/08/12 16:14	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.000010	2.5	W222010	DT	06/08/12 16:14	
SM 2340B	Hardness (as CaCO3)	149	mg/L	0.347	0.140		N/A		06/08/12 15:47	



Newmont - Surgold LLC
 Surinamestraat #54
 Paramaribo, SURINAME -

Project Name: Suriname - Merian Gold 2012
 Work Order: **W2E0651**
 Reported: 13-Jun-12 10:13

Client Sample ID: **19MAY12GW009**

SVL Sample ID: **W2E0651-10 (Ground Water)**

Sample Report Page 2 of 3

Sampled: 19-May-12 12:30
 Received: 23-May-12
 Sampled By: MA

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	< 0.080	mg/L	0.080	0.022		W221299	TJK	06/08/12 15:47	
EPA 200.7	Barium	0.0261	mg/L	0.0020	0.0006		W221299	TJK	06/08/12 15:47	
EPA 200.7	Boron	< 0.040	mg/L	0.040	0.014		W221299	TJK	06/08/12 15:47	
EPA 200.7	Calcium	31.5	mg/L	0.040	0.013		W221299	TJK	06/08/12 15:47	
EPA 200.7	Chromium	< 0.0060	mg/L	0.0060	0.0015		W221299	TJK	06/08/12 15:47	
EPA 200.7	Cobalt	< 0.0060	mg/L	0.0060	0.0014		W221299	TJK	06/08/12 15:47	
EPA 200.7	Iron	0.572	mg/L	0.060	0.022		W221299	DT	06/09/12 09:49	
EPA 200.7	Magnesium	17.0	mg/L	0.060	0.026		W221299	TJK	06/08/12 15:47	
EPA 200.7	Manganese	0.688	mg/L	0.0040	0.0014		W221299	TJK	06/08/12 15:47	
EPA 200.7	Molybdenum	< 0.008	mg/L	0.008	0.002		W221299	TJK	06/08/12 15:47	
EPA 200.7	Nickel	< 0.010	mg/L	0.010	0.004		W221299	TJK	06/08/12 15:47	
EPA 200.7	Potassium	0.80	mg/L	0.50	0.16		W221299	TJK	06/08/12 15:47	
EPA 200.7	Silicon	31.1	mg/L	0.08	0.03		W221299	DT	06/09/12 09:49	
EPA 200.7	Sodium	24.4	mg/L	0.50	0.14		W221299	TJK	06/08/12 15:47	
EPA 200.7	Titanium	< 0.0050	mg/L	0.0050	0.0004		W221299	TJK	06/08/12 15:47	
EPA 200.7	Vanadium	< 0.0050	mg/L	0.0050	0.0007		W221299	TJK	06/08/12 15:47	
EPA 200.7	Zinc	< 0.0100	mg/L	0.0100	0.0026		W221299	TJK	06/08/12 15:47	
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W222018	KWH	06/12/12 08:58	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W222018	KWH	06/12/12 08:58	
EPA 200.8	Beryllium	< 0.000200	mg/L	0.000200	0.000077		W222018	KWH	06/12/12 08:58	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.000014		W222018	KWH	06/12/12 08:58	
EPA 200.8	Copper	< 0.00100	mg/L	0.00100	0.000072		W222018	KWH	06/13/12 08:42	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000058		W222018	KWH	06/12/12 08:58	
EPA 200.8	Selenium	< 0.00300	mg/L	0.00300	0.00022		W222018	KWH	06/12/12 08:58	
EPA 200.8	Silver	< 0.000100	mg/L	0.000100	0.0000074		W222018	KWH	06/13/12 08:42	
EPA 200.8	Thallium	< 0.00100	mg/L	0.00100	0.0000075		W222018	KWH	06/12/12 08:58	
EPA 200.8	Uranium	< 0.00100	mg/L	0.00100	0.0000082		W222018	KWH	06/12/12 08:58	
EPA 245.1	Mercury	< 0.00020	mg/L	0.00020	0.000054		W223223	DJA	06/07/12 14:08	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	< 0.005	mg/L	0.005	0.0004		W222025	IIT	05/31/12 14:32	
EPA 120.1	Specific conductance	408	µmhos/cm	5.00			W221316	RS	05/24/12 09:55	
EPA 335.4	Cyanide (total)	< 0.0100	mg/L	0.0100	0.0021		W222023	IIT	05/30/12 11:54	
EPA 350.1	Ammonia as N	< 0.030	mg/L	0.030	0.006		W223013	RHW	06/07/12 11:07	
EPA 353.2	Nitrate/Nitrite as N	< 0.050	mg/L	0.050	0.008		W223018	RHW	06/06/12 13:47	
SM 2320B/2310B	Bicarbonate	204	mg/L	1.0	0.1		W221360	AAS	05/25/12 15:54	
SM 2320B/2310B	Carbonate	< 1.0	mg/L	1.0	0.1		W221360	AAS	05/25/12 15:54	
SM 2320B/2310B	Total Alkalinity	204	mg/L	1.0	0.1		W221360	AAS	05/25/12 15:54	
SM 2540 C	Total Diss. Solids	264	mg/L	10			W221321	RS	05/24/12 12:15	
SM 2540 D	Total Susp. Solids	< 5.0	mg/L	5.0			W221319	RS	05/24/12 12:15	
SM 4500 H B	pH @21.0°C	7.64	pH Units				W221360	AAS	05/25/12 15:54	H5
SM 4500-CN-I	Cyanide (WAD)	< 0.0100	mg/L	0.0100	0.0006		W221311	IIT	05/29/12 10:50	
SM 4500-P-E	Phosphorus	0.101	mg/L	0.010	0.005		W221383	CCM/S	05/25/12 12:57	



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Newmont - Surgold LLC
Surinamestraat #54
Paramaribo, SURINAME -

Project Name: Suriname - Merian Gold 2012
Work Order: **W2E0651**
Reported: 13-Jun-12 10:13

Client Sample ID: **19MAY12GW009**

SVL Sample ID: **W2E0651-10 (Ground Water)**

Sample Report Page 3 of 3

Sampled: 19-May-12 12:30
Received: 23-May-12
Sampled By: MA

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Anions by Ion Chromatography

EPA 300.0	Chloride	5.61	mg/L	0.20	0.03		W223310	AEW	06/08/12 00:29	
EPA 300.0	Fluoride	0.14	mg/L	0.10	0.02		W223310	AEW	06/08/12 00:29	
EPA 300.0	Sulfate as SO4	0.72	mg/L	0.30	0.05		W223310	AEW	06/08/12 00:29	

Cation/Anion Balance and TDS Ratios

Cation Sum: 3.96 meq/L Anion Sum: 4.26 meq/L C/A Balance: -3.61 % Calculated TDS: 287 TDS/cTDS: 0.92 TDS/eC: 0.65

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Newmont - Surgold LLC
Surinamestraat #54
Paramaribo, SURINAME -

Project Name: Suriname - Merian Gold 2012
Work Order: **W2E0651**
Reported: 13-Jun-12 10:13

Quality Control - BLANK Data

Method	Analyte	Units	Result	MDL	MRL	Batch ID	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	mg/L	<0.00020	0.000054	0.00020	W223228	07-Jun-12	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	mg/L	<0.080	0.011	0.080	W221300	09-Jun-12	
EPA 200.7	Barium	mg/L	<0.0020	0.0003	0.0020	W221300	09-Jun-12	
EPA 200.7	Boron	mg/L	<0.040	0.007	0.040	W221300	09-Jun-12	
EPA 200.7	Calcium	mg/L	<0.040	0.006	0.040	W221300	09-Jun-12	
EPA 200.7	Chromium	mg/L	<0.0060	0.0008	0.0060	W221300	09-Jun-12	
EPA 200.7	Cobalt	mg/L	<0.0060	0.0007	0.0060	W221300	09-Jun-12	
EPA 200.7	Iron	mg/L	<0.060	0.011	0.060	W221300	09-Jun-12	
EPA 200.7	Magnesium	mg/L	<0.060	0.013	0.060	W221300	09-Jun-12	
EPA 200.7	Manganese	mg/L	<0.0040	0.0007	0.0040	W221300	09-Jun-12	
EPA 200.7	Molybdenum	mg/L	<0.008	0.001	0.008	W221300	09-Jun-12	
EPA 200.7	Nickel	mg/L	<0.010	0.002	0.010	W221300	09-Jun-12	
EPA 200.7	Potassium	mg/L	<0.50	0.08	0.50	W221300	09-Jun-12	
EPA 200.7	Silicon	mg/L	<0.08	0.01	0.08	W221300	09-Jun-12	
EPA 200.7	Sodium	mg/L	<0.50	0.07	0.50	W221300	09-Jun-12	
EPA 200.7	Titanium	mg/L	<0.0050	0.0002	0.0050	W221300	09-Jun-12	
EPA 200.7	Vanadium	mg/L	<0.0050	0.0004	0.0050	W221300	09-Jun-12	
EPA 200.7	Zinc	mg/L	<0.0100	0.0013	0.0100	W221300	09-Jun-12	
EPA 200.8	Antimony	mg/L	<0.00300	0.00015	0.00300	W222010	08-Jun-12	
EPA 200.8	Arsenic	mg/L	<0.0030	0.0003	0.0030	W222010	08-Jun-12	
EPA 200.8	Beryllium	mg/L	<0.000200	0.000096	0.000200	W222010	08-Jun-12	
EPA 200.8	Copper	mg/L	<0.00100	0.00009	0.00100	W222010	08-Jun-12	
EPA 200.8	Lead	mg/L	<0.00300	0.000072	0.00300	W222010	08-Jun-12	
EPA 200.8	Selenium	mg/L	<0.00300	0.00028	0.00300	W222010	08-Jun-12	
EPA 200.8	Silver	mg/L	<0.000100	0.000018	0.000100	W222010	08-Jun-12	
EPA 200.8	Uranium	mg/L	<0.00100	0.000010	0.00100	W222010	08-Jun-12	
EPA 200.8	Thallium	mg/L	<0.00100	0.000009	0.00100	W222010	08-Jun-12	
EPA 200.8	Cadmium	mg/L	<0.00020	0.00002	0.00020	W222010	08-Jun-12	

Metals (Dissolved)

EPA 200.7	Aluminum	mg/L	<0.080	0.022	0.080	W221299	08-Jun-12	
EPA 200.7	Barium	mg/L	<0.0020	0.0006	0.0020	W221299	08-Jun-12	
EPA 200.7	Boron	mg/L	<0.040	0.014	0.040	W221299	08-Jun-12	
EPA 200.7	Calcium	mg/L	<0.040	0.013	0.040	W221299	08-Jun-12	
EPA 200.7	Chromium	mg/L	<0.0060	0.0015	0.0060	W221299	08-Jun-12	
EPA 200.7	Cobalt	mg/L	<0.0060	0.0014	0.0060	W221299	08-Jun-12	
EPA 200.7	Iron	mg/L	<0.060	0.022	0.060	W221299	08-Jun-12	
EPA 200.7	Magnesium	mg/L	<0.060	0.026	0.060	W221299	08-Jun-12	
EPA 200.7	Manganese	mg/L	<0.0040	0.0014	0.0040	W221299	08-Jun-12	
EPA 200.7	Molybdenum	mg/L	<0.008	0.002	0.008	W221299	08-Jun-12	
EPA 200.7	Nickel	mg/L	<0.010	0.004	0.010	W221299	08-Jun-12	
EPA 200.7	Potassium	mg/L	<0.50	0.16	0.50	W221299	08-Jun-12	
EPA 200.7	Silicon	mg/L	<0.08	0.03	0.08	W221299	08-Jun-12	
EPA 200.7	Sodium	mg/L	<0.50	0.14	0.50	W221299	08-Jun-12	
EPA 200.7	Titanium	mg/L	<0.0050	0.0004	0.0050	W221299	08-Jun-12	
EPA 200.7	Vanadium	mg/L	<0.0050	0.0007	0.0050	W221299	08-Jun-12	
EPA 200.7	Zinc	mg/L	<0.0100	0.0026	0.0100	W221299	08-Jun-12	
EPA 200.8	Antimony	mg/L	<0.00300	0.00012	0.00300	W222018	12-Jun-12	
EPA 200.8	Arsenic	mg/L	<0.0030	0.0002	0.0030	W222018	12-Jun-12	
EPA 200.8	Beryllium	mg/L	<0.000200	0.000077	0.000200	W222018	12-Jun-12	
EPA 200.8	Cadmium	mg/L	<0.00020	0.000014	0.00020	W222018	12-Jun-12	
EPA 200.8	Copper	mg/L	<0.00100	0.000072	0.00100	W222018	13-Jun-12	
EPA 200.8	Lead	mg/L	<0.00300	0.000058	0.00300	W222018	12-Jun-12	
EPA 200.8	Selenium	mg/L	<0.00300	0.00022	0.00300	W222018	12-Jun-12	
EPA 200.8	Silver	mg/L	<0.000100	0.0000074	0.000100	W222018	13-Jun-12	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



Newmont - Surgold LLC
 Surinamestraat #54
 Paramaribo, SURINAME -

Project Name: Suriname - Merian Gold 2012
 Work Order: **W2E0651**
 Reported: 13-Jun-12 10:13

Quality Control - BLANK Data (Continued)

Method	Analyte	Units	Result	MDL	MRL	Batch ID	Analyzed	Notes
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Metals (Dissolved) (Continued)

EPA 200.8	Thallium	mg/L	<0.00100	0.0000075	0.00100	W222018	12-Jun-12	
EPA 200.8	Uranium	mg/L	<0.00100	0.0000082	0.00100	W222018	12-Jun-12	
EPA 245.1	Mercury	mg/L	<0.00020	0.000054	0.00020	W223223	07-Jun-12	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	mg/L	<0.005	0.0004	0.005	W222025	29-May-12	
EPA 120.1	Specific conductance	µmhos/cm	<5.00		5.00	W221316	24-May-12	
EPA 335.4	Cyanide (total)	mg/L	<0.0100	0.0021	0.0100	W222023	29-May-12	
EPA 350.1	Ammonia as N	mg/L	<0.030	0.006	0.030	W223013	07-Jun-12	
EPA 353.2	Nitrate/Nitrite as N	mg/L	<0.050	0.008	0.050	W223018	06-Jun-12	
SM 2540 C	Total Diss. Solids	mg/L	<10		10	W221321	24-May-12	
SM 2540 D	Total Susp. Solids	mg/L	<5.0		5.0	W221319	24-May-12	
SM 4500-CN-I	Cyanide (WAD)	mg/L	<0.0100	0.0006	0.0100	W221311	29-May-12	
SM 4500-P-E	Phosphorus	mg/L	<0.010	0.005	0.010	W221383	25-May-12	

Anions by Ion Chromatography

EPA 300.0	Fluoride	mg/L	<0.10	0.02	0.10	W223310	07-Jun-12	
EPA 300.0	Chloride	mg/L	<0.20	0.03	0.20	W223310	07-Jun-12	
EPA 300.0	Sulfate as SO4	mg/L	<0.30	0.05	0.30	W223310	07-Jun-12	

Quality Control - LABORATORY CONTROL SAMPLE Data

Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Total)

EPA 245.1	Mercury	mg/L	0.00504	0.00500	101	85 - 115	W223228	07-Jun-12	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	mg/L	1.00	1.00	100	85 - 115	W221300	09-Jun-12	
EPA 200.7	Barium	mg/L	1.08	1.00	108	85 - 115	W221300	09-Jun-12	
EPA 200.7	Boron	mg/L	1.06	1.00	106	85 - 115	W221300	09-Jun-12	
EPA 200.7	Calcium	mg/L	19.5	20.0	97.4	85 - 115	W221300	09-Jun-12	
EPA 200.7	Chromium	mg/L	0.999	1.00	99.9	85 - 115	W221300	09-Jun-12	
EPA 200.7	Cobalt	mg/L	1.01	1.00	101	85 - 115	W221300	09-Jun-12	
EPA 200.7	Iron	mg/L	9.63	10.0	96.3	85 - 115	W221300	09-Jun-12	
EPA 200.7	Magnesium	mg/L	19.9	20.0	99.5	85 - 115	W221300	09-Jun-12	
EPA 200.7	Manganese	mg/L	1.01	1.00	101	85 - 115	W221300	09-Jun-12	
EPA 200.7	Molybdenum	mg/L	1.03	1.00	103	85 - 115	W221300	09-Jun-12	
EPA 200.7	Nickel	mg/L	0.949	1.00	94.9	85 - 115	W221300	09-Jun-12	
EPA 200.7	Potassium	mg/L	20.2	20.0	101	85 - 115	W221300	09-Jun-12	
EPA 200.7	Silicon	mg/L	5.24	5.00	105	85 - 115	W221300	09-Jun-12	
EPA 200.7	Sodium	mg/L	17.8	19.0	93.6	85 - 115	W221300	09-Jun-12	
EPA 200.7	Titanium	mg/L	1.03	1.00	103	85 - 115	W221300	09-Jun-12	
EPA 200.7	Vanadium	mg/L	1.02	1.00	102	85 - 115	W221300	09-Jun-12	
EPA 200.7	Zinc	mg/L	1.02	1.00	102	85 - 115	W221300	09-Jun-12	
EPA 200.8	Antimony	mg/L	0.0269	0.0250	108	85 - 115	W222010	08-Jun-12	
EPA 200.8	Arsenic	mg/L	0.0254	0.0250	102	85 - 115	W222010	08-Jun-12	
EPA 200.8	Beryllium	mg/L	0.0251	0.0250	101	85 - 115	W222010	08-Jun-12	
EPA 200.8	Copper	mg/L	0.0257	0.0250	103	85 - 115	W222010	08-Jun-12	
EPA 200.8	Lead	mg/L	0.0262	0.0250	105	85 - 115	W222010	08-Jun-12	
EPA 200.8	Selenium	mg/L	0.0240	0.0250	96.0	85 - 115	W222010	08-Jun-12	
EPA 200.8	Silver	mg/L	0.0259	0.0250	104	85 - 115	W222010	08-Jun-12	
EPA 200.8	Uranium	mg/L	0.0274	0.0250	110	85 - 115	W222010	08-Jun-12	
EPA 200.8	Thallium	mg/L	0.0262	0.0250	105	85 - 115	W222010	08-Jun-12	
EPA 200.8	Cadmium	mg/L	0.0260	0.0250	104	85 - 115	W222010	08-Jun-12	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



Newmont - Surgold LLC
 Surinamestraat #54
 Paramaribo, SURINAME -

Project Name: Suriname - Merian Gold 2012
 Work Order: **W2E0651**
 Reported: 13-Jun-12 10:13

Quality Control - LABORATORY CONTROL SAMPLE Data (Continued)

Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
Metals (Dissolved)									
EPA 200.7	Aluminum	mg/L	0.966	1.00	96.6	85 - 115	W221299	08-Jun-12	
EPA 200.7	Barium	mg/L	0.955	1.00	95.5	85 - 115	W221299	08-Jun-12	
EPA 200.7	Boron	mg/L	0.967	1.00	96.7	85 - 115	W221299	08-Jun-12	
EPA 200.7	Calcium	mg/L	18.3	20.0	91.5	85 - 115	W221299	08-Jun-12	
EPA 200.7	Chromium	mg/L	0.972	1.00	97.2	85 - 115	W221299	08-Jun-12	
EPA 200.7	Cobalt	mg/L	0.939	1.00	93.9	85 - 115	W221299	08-Jun-12	
EPA 200.7	Iron	mg/L	9.48	10.0	94.8	85 - 115	W221299	08-Jun-12	
EPA 200.7	Magnesium	mg/L	18.9	20.0	94.6	85 - 115	W221299	08-Jun-12	
EPA 200.7	Manganese	mg/L	0.964	1.00	96.4	85 - 115	W221299	08-Jun-12	
EPA 200.7	Molybdenum	mg/L	0.972	1.00	97.2	85 - 115	W221299	08-Jun-12	
EPA 200.7	Nickel	mg/L	0.916	1.00	91.6	85 - 115	W221299	08-Jun-12	
EPA 200.7	Potassium	mg/L	19.3	20.0	96.6	85 - 115	W221299	08-Jun-12	
EPA 200.7	Silicon	mg/L	5.03	5.00	101	85 - 115	W221299	08-Jun-12	
EPA 200.7	Sodium	mg/L	19.0	19.0	100	85 - 115	W221299	08-Jun-12	
EPA 200.7	Titanium	mg/L	0.971	1.00	97.1	85 - 115	W221299	08-Jun-12	
EPA 200.7	Vanadium	mg/L	0.986	1.00	98.6	85 - 115	W221299	08-Jun-12	
EPA 200.7	Zinc	mg/L	0.939	1.00	93.9	85 - 115	W221299	08-Jun-12	
EPA 200.8	Antimony	mg/L	0.0252	0.0250	101	85 - 115	W222018	12-Jun-12	
EPA 200.8	Arsenic	mg/L	0.0263	0.0250	105	85 - 115	W222018	12-Jun-12	
EPA 200.8	Beryllium	mg/L	0.0251	0.0250	101	85 - 115	W222018	12-Jun-12	
EPA 200.8	Cadmium	mg/L	0.0252	0.0250	101	85 - 115	W222018	12-Jun-12	
EPA 200.8	Copper	mg/L	0.0270	0.0250	108	85 - 115	W222018	13-Jun-12	
EPA 200.8	Lead	mg/L	0.0249	0.0250	99.7	85 - 115	W222018	12-Jun-12	
EPA 200.8	Selenium	mg/L	0.0255	0.0250	102	85 - 115	W222018	12-Jun-12	
EPA 200.8	Silver	mg/L	0.0245	0.0250	98.1	85 - 115	W222018	13-Jun-12	
EPA 200.8	Thallium	mg/L	0.0244	0.0250	97.7	85 - 115	W222018	12-Jun-12	
EPA 200.8	Uranium	mg/L	0.0242	0.0250	97.0	85 - 115	W222018	12-Jun-12	
EPA 245.1	Mercury	mg/L	0.00498	0.00500	99.6	85 - 115	W223223	07-Jun-12	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	mg/L	0.141	0.150	94.0	85 - 115	W222025	29-May-12	
EPA 120.1	Specific conductance	µmhos/cm	502	494	102	90 - 110	W221316	24-May-12	
EPA 335.4	Cyanide (total)	mg/L	0.150	0.150	100	90 - 110	W222023	29-May-12	
EPA 350.1	Ammonia as N	mg/L	0.793	0.750	106	90 - 110	W223013	07-Jun-12	
EPA 353.2	Nitrate/Nitrite as N	mg/L	1.94	2.00	96.9	90 - 110	W223018	06-Jun-12	
SM 4500-CN-I	Cyanide (WAD)	mg/L	0.151	0.150	101	90 - 110	W221311	29-May-12	
SM 4500-P-E	Phosphorus	mg/L	0.723	0.720	100	90 - 110	W221383	25-May-12	

Anions by Ion Chromatography

EPA 300.0	Fluoride	mg/L	2.04	2.00	102	90 - 110	W223310	07-Jun-12	
EPA 300.0	Chloride	mg/L	2.89	3.00	96.4	90 - 110	W223310	07-Jun-12	
EPA 300.0	Sulfate as SO4	mg/L	10.7	10.0	107	90 - 110	W223310	07-Jun-12	

Quality Control - DUPLICATE Data

Method	Analyte	Units	Duplicate Result	Sample Result	RPD	RPD Limit	Batch ID	Analyzed	Notes
EPA 245.1	Mercury	mg/L	<0.00020	<0.00020	UDL	20	W223228	07-Jun-12	

Metals (Total)

EPA 245.1	Mercury	mg/L	<0.00020	<0.00020	UDL	20	W223228	07-Jun-12	
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.7	Aluminum	mg/L	<0.080	<0.080	UDL	20	W221300	09-Jun-12	
EPA 200.7	Barium	mg/L	0.0230	0.0231	0.2	20	W221300	09-Jun-12	
EPA 200.7	Boron	mg/L	<0.040	<0.040	<RL	20	W221300	09-Jun-12	
EPA 200.7	Calcium	mg/L	13.0	12.9	0.5	20	W221300	09-Jun-12	
EPA 200.7	Chromium	mg/L	<0.0060	<0.0060	UDL	20	W221300	09-Jun-12	
EPA 200.7	Cobalt	mg/L	<0.0060	<0.0060	<RL	20	W221300	09-Jun-12	

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AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



Newmont - Surgold LLC
 Surinamestraat #54
 Paramaribo, SURINAME -

Project Name: Suriname - Merian Gold 2012
 Work Order: **W2E0651**
 Reported: 13-Jun-12 10:13

Quality Control - DUPLICATE Data (Continued)

Method	Analyte	Units	Duplicate Result	Sample Result	RPD	RPD Limit	Batch ID	Analyzed	Notes
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Metals (Total Recoverable--reportable as Total per 40 CFR 136) (Continued)

EPA 200.7	Iron	mg/L	2.58	2.55	0.9	20	W221300	09-Jun-12	
EPA 200.7	Magnesium	mg/L	8.83	8.80	0.4	20	W221300	09-Jun-12	
EPA 200.7	Manganese	mg/L	0.605	0.599	1.0	20	W221300	09-Jun-12	
EPA 200.7	Molybdenum	mg/L	<0.008	<0.008	<RL	20	W221300	09-Jun-12	
EPA 200.7	Nickel	mg/L	<0.010	<0.010	<RL	20	W221300	09-Jun-12	
EPA 200.7	Potassium	mg/L	0.91	0.85	7.7	20	W221300	09-Jun-12	
EPA 200.7	Silicon	mg/L	33.4	33.1	1.0	20	W221300	09-Jun-12	
EPA 200.7	Sodium	mg/L	22.8	22.4	1.8	20	W221300	09-Jun-12	
EPA 200.7	Titanium	mg/L	<0.0050	<0.0050	UDL	20	W221300	09-Jun-12	
EPA 200.7	Vanadium	mg/L	<0.0050	<0.0050	UDL	20	W221300	09-Jun-12	
EPA 200.7	Zinc	mg/L	<0.0100	<0.0100	UDL	20	W221300	09-Jun-12	
EPA 200.8	Antimony	mg/L	<0.00300	<0.00300	UDL	20	W222010	08-Jun-12	
EPA 200.8	Arsenic	mg/L	0.0030	0.0031	2.1	20	W222010	08-Jun-12	
EPA 200.8	Beryllium	mg/L	<0.000200	<0.000200	UDL	20	W222010	08-Jun-12	
EPA 200.8	Copper	mg/L	0.00108	0.00110	1.1	20	W222010	08-Jun-12	
EPA 200.8	Lead	mg/L	<0.00300	<0.00300	<RL	20	W222010	08-Jun-12	
EPA 200.8	Selenium	mg/L	<0.00300	<0.00300	UDL	20	W222010	08-Jun-12	
EPA 200.8	Silver	mg/L	0.000150	0.000210	33.6	20	W222010	08-Jun-12	R1
EPA 200.8	Uranium	mg/L	<0.00100	<0.00100	UDL	20	W222010	08-Jun-12	
EPA 200.8	Thallium	mg/L	<0.00100	<0.00100	UDL	20	W222010	08-Jun-12	
EPA 200.8	Cadmium	mg/L	<0.00020	<0.00020	UDL	20	W222010	08-Jun-12	

Metals (Dissolved)

EPA 200.7	Aluminum	mg/L	<0.080	<0.080	UDL	20	W221299	08-Jun-12	
EPA 200.7	Barium	mg/L	0.0210	0.0209	0.2	20	W221299	08-Jun-12	
EPA 200.7	Boron	mg/L	<0.040	<0.040	UDL	20	W221299	08-Jun-12	
EPA 200.7	Calcium	mg/L	12.5	12.5	0.5	20	W221299	08-Jun-12	
EPA 200.7	Chromium	mg/L	<0.0060	<0.0060	UDL	20	W221299	08-Jun-12	
EPA 200.7	Cobalt	mg/L	<0.0060	<0.0060	<RL	20	W221299	08-Jun-12	
EPA 200.7	Iron	mg/L	2.42	2.41	0.5	20	W221299	08-Jun-12	
EPA 200.7	Magnesium	mg/L	8.44	8.39	0.6	20	W221299	08-Jun-12	
EPA 200.7	Manganese	mg/L	0.583	0.578	0.9	20	W221299	08-Jun-12	
EPA 200.7	Molybdenum	mg/L	<0.008	<0.008	UDL	20	W221299	08-Jun-12	
EPA 200.7	Nickel	mg/L	<0.010	<0.010	<RL	20	W221299	08-Jun-12	
EPA 200.7	Potassium	mg/L	0.95	0.94	1.7	20	W221299	08-Jun-12	
EPA 200.7	Silicon	mg/L	32.6	32.6	0.0	20	W221299	08-Jun-12	
EPA 200.7	Sodium	mg/L	24.5	24.4	0.2	20	W221299	08-Jun-12	
EPA 200.7	Titanium	mg/L	<0.0050	<0.0050	UDL	20	W221299	08-Jun-12	
EPA 200.7	Vanadium	mg/L	<0.0050	<0.0050	UDL	20	W221299	08-Jun-12	
EPA 200.7	Zinc	mg/L	<0.0100	<0.0100	UDL	20	W221299	08-Jun-12	
EPA 200.8	Antimony	mg/L	<0.00300	<0.00300	<RL	20	W222018	12-Jun-12	
EPA 200.8	Arsenic	mg/L	0.0036	0.0036	0.4	20	W222018	12-Jun-12	
EPA 200.8	Beryllium	mg/L	<0.000200	<0.000200	UDL	20	W222018	12-Jun-12	
EPA 200.8	Cadmium	mg/L	<0.00020	<0.00020	UDL	20	W222018	12-Jun-12	
EPA 200.8	Copper	mg/L	<0.00100	<0.00100	<RL	20	W222018	13-Jun-12	
EPA 200.8	Lead	mg/L	<0.00300	<0.00300	<RL	20	W222018	12-Jun-12	
EPA 200.8	Selenium	mg/L	<0.00300	<0.00300	UDL	20	W222018	12-Jun-12	
EPA 200.8	Silver	mg/L	<0.000100	<0.000100	UDL	20	W222018	13-Jun-12	
EPA 200.8	Thallium	mg/L	<0.00100	<0.00100	<RL	20	W222018	12-Jun-12	
EPA 200.8	Uranium	mg/L	<0.00100	<0.00100	<RL	20	W222018	12-Jun-12	
EPA 245.1	Mercury	mg/L	<0.00020	<0.00020	UDL	20	W223223	07-Jun-12	

Classical Chemistry Parameters

EPA 120.1	Specific conductance	µmhos/cm	134	140	3.9	20	W221316	24-May-12	
EPA 120.1	Specific conductance	µmhos/cm	138	126	8.4	20	W221316	24-May-12	
EPA 335.4	Cyanide (total)	mg/L	<0.0100	<0.0100	UDL	20	W222023	29-May-12	
EPA 350.1	Ammonia as N	mg/L	<0.030	0.036	<RL	20	W223013	07-Jun-12	R2

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



Newmont - Surgold LLC
 Surinamestraat #54
 Paramaribo, SURINAME -

Project Name: Suriname - Merian Gold 2012
 Work Order: **W2E0651**
 Reported: 13-Jun-12 10:13

Quality Control - DUPLICATE Data (Continued)

Method	Analyte	Units	Duplicate Result	Sample Result	RPD	RPD Limit	Batch ID	Analyzed	Notes
Classical Chemistry Parameters (Continued)									
EPA 353.2	Nitrate/Nitrite as N	mg/L	0.450	0.437	3.0	20	W223018	06-Jun-12	
SM 2320B/2310B	Total Alkalinity	mg/L	108	108	0.1	20	W221360	25-May-12	
SM 2320B/2310B	Total Alkalinity	mg/L	200	204	1.9	20	W221360	25-May-12	
SM 2320B/2310B	Bicarbonate	mg/L	108	108	0.1	20	W221360	25-May-12	
SM 2320B/2310B	Bicarbonate	mg/L	200	204	1.9	20	W221360	25-May-12	
SM 2320B/2310B	Carbonate	mg/L	<1.0	<1.0	UDL	20	W221360	25-May-12	
SM 2320B/2310B	Carbonate	mg/L	<1.0	<1.0	UDL	20	W221360	25-May-12	
SM 2540 C	Total Diss. Solids	mg/L	268	276	2.9	10	W221321	24-May-12	
SM 2540 C	Total Diss. Solids	mg/L	462	446	3.5	10	W221321	24-May-12	
SM 2540 D	Total Susp. Solids	mg/L	<5.0	<5.0	<RL	10	W221319	24-May-12	
SM 2540 D	Total Susp. Solids	mg/L	<5.0	<5.0	UDL	10	W221319	24-May-12	
SM 4500 H B	pH	pH Units	7.28	7.42	1.9	20	W221360	25-May-12	R1
SM 4500 H B	pH	pH Units	7.64	7.64	0.0	20	W221360	25-May-12	
SM 4500-CN-I	Cyanide (WAD)	mg/L	<0.0100	<0.0100	UDL	20	W221311	29-May-12	
SM 4500-P-E	Phosphorus	mg/L	0.055	0.058	5.1	20	W221383	25-May-12	

Anions by Ion Chromatography

EPA 300.0	Fluoride	mg/L	<0.10	<0.10	<RL	20	W223310	07-Jun-12	
EPA 300.0	Chloride	mg/L	3.89	4.18	7.1	20	W223310	07-Jun-12	
EPA 300.0	Sulfate as SO4	mg/L	5.65	5.70	0.9	20	W223310	07-Jun-12	

Quality Control - MATRIX SPIKE Data

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
Metals (Total)										
EPA 245.1	Mercury	mg/L	0.00102	<0.00020	0.00100	102	70 - 130	W223228	07-Jun-12	
EPA 245.1	Mercury	mg/L	0.00105	<0.00020	0.00100	105	70 - 130	W223228	07-Jun-12	
Metals (Total Recoverable--reportable as Total per 40 CFR 136)										
EPA 200.7	Aluminum	mg/L	1.04	<0.080	1.00	104	70 - 130	W221300	09-Jun-12	
EPA 200.7	Barium	mg/L	1.12	0.0231	1.00	109	70 - 130	W221300	09-Jun-12	
EPA 200.7	Boron	mg/L	1.09	<0.040	1.00	108	70 - 130	W221300	09-Jun-12	
EPA 200.7	Calcium	mg/L	32.7	12.9	20.0	99.2	70 - 130	W221300	09-Jun-12	
EPA 200.7	Chromium	mg/L	1.01	<0.0060	1.00	101	70 - 130	W221300	09-Jun-12	
EPA 200.7	Cobalt	mg/L	1.02	<0.0060	1.00	102	70 - 130	W221300	09-Jun-12	
EPA 200.7	Iron	mg/L	12.2	2.55	10.0	96.6	70 - 130	W221300	09-Jun-12	
EPA 200.7	Magnesium	mg/L	28.6	8.80	20.0	98.8	70 - 130	W221300	09-Jun-12	
EPA 200.7	Manganese	mg/L	1.62	0.599	1.00	102	70 - 130	W221300	09-Jun-12	
EPA 200.7	Molybdenum	mg/L	1.04	<0.008	1.00	104	70 - 130	W221300	09-Jun-12	
EPA 200.7	Nickel	mg/L	0.969	<0.010	1.00	96.5	70 - 130	W221300	09-Jun-12	
EPA 200.7	Potassium	mg/L	21.4	0.85	20.0	103	70 - 130	W221300	09-Jun-12	
EPA 200.7	Silicon	mg/L	38.9	33.1	5.00	116	70 - 130	W221300	09-Jun-12	
EPA 200.7	Sodium	mg/L	40.6	22.4	19.0	95.8	70 - 130	W221300	09-Jun-12	
EPA 200.7	Titanium	mg/L	1.05	<0.0050	1.00	105	70 - 130	W221300	09-Jun-12	
EPA 200.7	Vanadium	mg/L	1.03	<0.0050	1.00	103	70 - 130	W221300	09-Jun-12	
EPA 200.7	Zinc	mg/L	1.03	<0.0100	1.00	103	70 - 130	W221300	09-Jun-12	
EPA 200.8	Antimony	mg/L	0.0253	<0.00300	0.0250	101	70 - 130	W222010	08-Jun-12	
EPA 200.8	Arsenic	mg/L	0.0266	0.0031	0.0250	93.8	70 - 130	W222010	08-Jun-12	
EPA 200.8	Beryllium	mg/L	0.0232	<0.000200	0.0250	92.6	70 - 130	W222010	08-Jun-12	
EPA 200.8	Copper	mg/L	0.0249	0.00110	0.0250	95.3	70 - 130	W222010	08-Jun-12	
EPA 200.8	Lead	mg/L	0.0224	<0.00300	0.0250	88.9	70 - 130	W222010	08-Jun-12	
EPA 200.8	Selenium	mg/L	0.0223	<0.00300	0.0250	89.4	70 - 130	W222010	08-Jun-12	
EPA 200.8	Silver	mg/L	0.0236	0.000210	0.0250	93.7	70 - 130	W222010	08-Jun-12	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



Newmont - Surgold LLC
 Surinamestraat #54
 Paramaribo, SURINAME -

Project Name: Suriname - Merian Gold 2012
 Work Order: **W2E0651**
 Reported: 13-Jun-12 10:13

Quality Control - MATRIX SPIKE Data (Continued)

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Total Recoverable--reportable as Total per 40 CFR 136) (Continued)

EPA 200.8	Uranium	mg/L	0.0231	<0.00100	0.0250	92.4	70 - 130	W222010	08-Jun-12	
EPA 200.8	Thallium	mg/L	0.0228	<0.00100	0.0250	91.1	70 - 130	W222010	08-Jun-12	
EPA 200.8	Cadmium	mg/L	0.0239	<0.00020	0.0250	95.5	70 - 130	W222010	08-Jun-12	

Metals (Dissolved)

EPA 200.7	Aluminum	mg/L	1.03	<0.080	1.00	103	70 - 130	W221299	08-Jun-12	
EPA 200.7	Barium	mg/L	1.00	0.0209	1.00	98.0	70 - 130	W221299	08-Jun-12	
EPA 200.7	Boron	mg/L	1.02	<0.040	1.00	102	70 - 130	W221299	08-Jun-12	
EPA 200.7	Calcium	mg/L	31.5	12.5	20.0	95.4	70 - 130	W221299	08-Jun-12	
EPA 200.7	Chromium	mg/L	0.998	<0.0060	1.00	99.8	70 - 130	W221299	08-Jun-12	
EPA 200.7	Cobalt	mg/L	0.965	<0.0060	1.00	96.1	70 - 130	W221299	08-Jun-12	
EPA 200.7	Iron	mg/L	11.7	2.41	10.0	92.6	70 - 130	W221299	08-Jun-12	
EPA 200.7	Magnesium	mg/L	27.9	8.39	20.0	97.4	70 - 130	W221299	08-Jun-12	
EPA 200.7	Manganese	mg/L	1.58	0.578	1.00	100	70 - 130	W221299	08-Jun-12	
EPA 200.7	Molybdenum	mg/L	0.987	<0.008	1.00	98.7	70 - 130	W221299	08-Jun-12	
EPA 200.7	Nickel	mg/L	0.960	<0.010	1.00	95.3	70 - 130	W221299	08-Jun-12	
EPA 200.7	Potassium	mg/L	20.7	0.94	20.0	98.7	70 - 130	W221299	08-Jun-12	
EPA 200.7	Silicon	mg/L	37.4	32.6	5.00	96.3	70 - 130	W221299	08-Jun-12	
EPA 200.7	Sodium	mg/L	44.2	24.4	19.0	104	70 - 130	W221299	08-Jun-12	
EPA 200.7	Titanium	mg/L	1.00	<0.0050	1.00	100	70 - 130	W221299	08-Jun-12	
EPA 200.7	Vanadium	mg/L	1.01	<0.0050	1.00	101	70 - 130	W221299	08-Jun-12	
EPA 200.7	Zinc	mg/L	0.966	<0.0100	1.00	96.6	70 - 130	W221299	08-Jun-12	
EPA 200.8	Antimony	mg/L	0.0263	<0.00300	0.0250	104	70 - 130	W222018	12-Jun-12	
EPA 200.8	Arsenic	mg/L	0.0295	0.0036	0.0250	104	70 - 130	W222018	12-Jun-12	
EPA 200.8	Beryllium	mg/L	0.0269	<0.000200	0.0250	108	70 - 130	W222018	12-Jun-12	
EPA 200.8	Cadmium	mg/L	0.0262	<0.00020	0.0250	105	70 - 130	W222018	12-Jun-12	
EPA 200.8	Copper	mg/L	0.0272	<0.00100	0.0250	105	70 - 130	W222018	13-Jun-12	
EPA 200.8	Lead	mg/L	0.0266	<0.00300	0.0250	106	70 - 130	W222018	12-Jun-12	
EPA 200.8	Selenium	mg/L	0.0262	<0.00300	0.0250	104	70 - 130	W222018	12-Jun-12	
EPA 200.8	Silver	mg/L	0.0233	<0.000100	0.0250	93.0	70 - 130	W222018	13-Jun-12	
EPA 200.8	Thallium	mg/L	0.0263	<0.00100	0.0250	105	70 - 130	W222018	12-Jun-12	
EPA 200.8	Uranium	mg/L	0.0264	<0.00100	0.0250	106	70 - 130	W222018	12-Jun-12	
EPA 245.1	Mercury	mg/L	0.00104	<0.00020	0.00100	104	70 - 130	W223223	07-Jun-12	

Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	mg/L	0.096	<0.005	0.100	95.0	85 - 115	W222025	29-May-12	
ASTM D7237	Cyanide (free)	mg/L	0.105	<0.005	0.100	105	85 - 115	W222025	29-May-12	
EPA 335.4	Cyanide (total)	mg/L	0.102	<0.0100	0.100	102	90 - 110	W222023	29-May-12	
EPA 335.4	Cyanide (total)	mg/L	0.102	<0.0100	0.100	102	90 - 110	W222023	29-May-12	
EPA 350.1	Ammonia as N	mg/L	0.554	0.036	0.500	104	90 - 110	W223013	07-Jun-12	
EPA 350.1	Ammonia as N	mg/L	0.572	<0.030	0.500	110	90 - 110	W223013	07-Jun-12	
EPA 353.2	Nitrate/Nitrite as N	mg/L	1.56	0.437	1.00	112	90 - 110	W223018	06-Jun-12	M1
EPA 353.2	Nitrate/Nitrite as N	mg/L	1.10	<0.050	1.00	108	90 - 110	W223018	06-Jun-12	
SM 4500-CN-I	Cyanide (WAD)	mg/L	0.101	<0.0100	0.100	101	75 - 125	W221311	29-May-12	
SM 4500-CN-I	Cyanide (WAD)	mg/L	0.101	<0.0100	0.100	101	75 - 125	W221311	29-May-12	
SM 4500-P-E	Phosphorus	mg/L	0.559	0.058	0.500	100	75 - 125	W221383	25-May-12	

Anions by Ion Chromatography

EPA 300.0	Fluoride	mg/L	2.08	<0.10	2.00	99.8	90 - 110	W223310	07-Jun-12	
EPA 300.0	Fluoride	mg/L	2.21	0.20	2.00	101	90 - 110	W223310	08-Jun-12	
EPA 300.0	Chloride	mg/L	7.02	4.18	3.00	94.8	90 - 110	W223310	07-Jun-12	
EPA 300.0	Chloride	mg/L	28.1	25.3	3.00	93.0	90 - 110	W223310	08-Jun-12	D2,M3
EPA 300.0	Sulfate as SO4	mg/L	16.7	5.70	10.0	110	90 - 110	W223310	07-Jun-12	
EPA 300.0	Sulfate as SO4	mg/L	255	249	10.0	R > 4S	90 - 110	W223310	08-Jun-12	D2,M3



Newmont - Surgold LLC
Surinamestraat #54
Paramaribo, SURINAME -

Project Name: Suriname - Merian Gold 2012
Work Order: **W2E0651**
Reported: 13-Jun-12 10:13

Quality Control - MATRIX SPIKE DUPLICATE Data

Method	Analyte	Units	MSD Result	Spike Result	Spike Level	RPD	RPD Limit	Batch ID	Analyzed	Notes
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Classical Chemistry Parameters

ASTM D7237	Cyanide (free)	mg/L	0.097	0.096	0.100	1.0	20	W222025	29-May-12	
ASTM D7237	Cyanide (free)	mg/L	0.104	0.105	0.100	1.0	20	W222025	29-May-12	
SM 4500-P-E	Phosphorus	mg/L	0.568	0.559	0.500	1.6	20	W221383	25-May-12	

Notes and Definitions

D2	Sample required dilution due to high concentration of target analyte.
H1	Sample analysis performed past holding time.
H3	Sample was received and analyzed past holding time.
H5	This test is specified to be performed in the field within 15 minutes of sampling; sample was received and analyzed past the regulatory holding time.
M1	Matrix spike recovery was high, but the LCS recovery was acceptable.
M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to spike level. The LCS was acceptable.
N3	Filtered slow; reduced volume
N3a	Samples did not test positive for sulfides, however, initial free results were higher than total results. Samples were treated with cadmium carbonate and reran.
Q14	Sample was colored, a color correction solution was added and then compared to an aliquot of the original sample.
R1	RPD exceeded the method acceptance limit.
R2	RPD exceeded the laboratory acceptance limit.
LCS	Laboratory Control Sample (Blank Spike)
RPD	Relative Percent Difference
UDL	A result is less than the detection limit
R > 4S	% recovery not applicable, sample concentration more than four times greater than spike level
<RL	A result is less than the reporting limit
MRL	Method Reporting Limit
MDL	Method Detection Limit
N/A	Not Applicable

UNIVERSITY LAB RESULTS



ANTON DE KOM UNIVERSITEIT VAN SURINAME

**Nationale Zoölogische Collectie van Suriname (NZCS)/
Centrum voor Milieu Onderzoek (CMO)**

Universiteitscomplex, Leysweg 9, Postbus 9212, Paramaribo, SURINAME,
Tel. (597) 494756 of 465558 tst. 339/340, fax (597) 494756,
e-mail nzcs@uvs.edu, website: nzcs.uvs.edu

Paramaribo, 30 november 2011

RESULTAAT ANALYSE

Aanvraag nr: ML10

Aanvrager: Surgold
Surinamestraat # 54
Paramaribo

Datum sample verzameld	Tijd	Datum sample ontvangst	locatie	Concentratie (mg/L)
22/11/2011	13:15	24/11/11	SW014	1.5
23/11/2011	09:50	24/11/11	SW016	1.3

Tijdsduur analyse: 5 dagen (24 november t/m 29 november 2011)

Methode : BODTrak methode

Calibratie datum: 24 november 2011

Opmerking:

Monsters zijn niet binnen de aangegeven tijd van 24 uur na monsternamen ingezet.

Voor betrouwbare resultaten gelieve hiermee rekening te houden.

Met vriendelijke groeten,

Mej. G. Landburg MSc.

Fungerend Hoofd Milieu-Laboratorium NZCS/CMO

**Nationale Zoölogische Collectie
van Suriname (NZCS)
Universiteit van Suriname
1.B. 9212. Paramaribo. Suriname**

Request nr.:	27a + 27 b
Requester:	Surgold
Contact person:	Mrs. I. Pradon/J. Pietraszek
Samples receiving date:	Monday, December 12, 2011 Tuesday, December 13, 2011
Number of samples:	Respectively 8 and 4
Type of water body:	Groundwater
Sampled by:	Surgold
Sampling locations:	Respectively 2 and 1(see results below)

Analysis results:

Location:	PO ₄ ³⁻ (mg/L) (not digested)	P (mg/L)(after digestion)	TSS (mg/L)	TDS (mg/L)	
TSF-PZ5-DVP			10	230	December 12, 2011
TSF-PZ5-DVP (filtered)	0.97 (SRP)	0.76 (SUP)			
TSF-PZ5-DVP (unfiltered)	1.10	0.92 (TP)			
TSF-PZ5			13	192	
TSF-PZ5 (filtered)	0.93 (SRP)	0.86 (SUP)			
TSF-PZ5 (unfiltered)	0.70	0.34 (TP)			
MA-PZ6-TW			23	337	December 13, 2011
MA-PZ6-TW (filtered)	0.66 (SRP)	0.24 (SUP)			
MA-PZ6-TW (unfiltered)	0.56	0.22 (TP)			

Remarks:

SRP = soluble reactive phosphorous (largely PO₄³⁻)

SUP = soluble unreactive phosphorous (organic forms of phosphorous and polyphosphates)

TP = "Total" phosphorous

Total phosphorus is largely defined on the basis of how much phosphorus in its various forms will be oxidized into orthophosphate by a specific oxidant.

Total phosphorous incorporates the total of all filterable and particulate phosphorus forms.

If a 0.45 micron cellulose (Millipore) filter was used it excluded most particulates, but colloidal phosphorus may be present in the filtered fraction.

FILTERED samples for determination of phosphates were not acidified

UNFILTERED samples for determination of phosphates were acidified

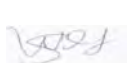
For details about date and time of sampling see Field Form

Acid Persulfate Digestion method was used

Analytical method: Ascorbic acid spectrophotometric method

Limit of detection: 0.02 to 2.50 mg/L PO₄³⁻

Approved by Head of Laboratory:




Drs. G. Wesenhagen

Date: January 6, 2012

Request nr.:	27c
Requester:	Surgold
Contact person:	Mrs. I. Pradon/J. Pietraszek
Samples receiving date:	Thursday December 15, 2011
Number of samples:	40
Type of water body:	Groundwater
Sampled by:	Surgold
Sampling locations:	9

Analysis results:

Location:	PO ₄ ³⁻ (mg/L) (not digested)	P (mg/L) (after digestion)	TSS (mg/L)	TDS (mg/L)
TSF-MW-1-SA (TSS + TDS)			18	236
TSF-PZ3-TW (TSS + TDS)			288	512
MA-PZ1-TW1 (TSS + TDS)			0	328
12-Dec MA-PZ1-TW1 (filtered)	0.40 (SRP)	0.30 (SUP)		
MA-PZ1-TW1 (unfiltered)	0.43	0.27 (TP)		
FIELD BLANC (TSS + TDS)			0	55
TSF-TW-3 (TSS + TDS)			27	497
TSF-TW-3 (filtered)	0.13(SRP)	0.04 (SUP)		
TSF-TW-3 (unfiltered)	0.14	0.02 (TP)		
TSF-MW-1 (TSS + TDS)			0	132
TSF-MW-1 (filtered)	0.24 (SRP)	0.12 (SUP)		
TSF-MW-1 (unfiltered)	0.18	0.04 (TP)		
MZ-PZ1-TW1 (TSS + TDS)			58	296
MZ-PZ1-TW1 (filtered)	0.65 (SRP)	0.34 (SUP)		
MZ-PZ1-TW1 (unfiltered)	0.65	0.38 (TP)		
TSF-PZ-8-F (TSS + TDS)			0	11
TSF-PZ-8-F (filtered)	0.01 (SRP)	0.01 (SUP)		
TSF-PZ-8-F (unfiltered)	0.01	0.01 (TP)		
TSF-PZ-8-E (TSS + TDS)			0	13
TSF-PZ-8-E (filtered)	0.01 (SRP)	0.01 (SUP)		
TSF-PZ-8-E (unfiltered)	0.02	0.00 (TP)		
10-Dec-11 MA-PZ1-TW1 (TSS + TDS)			6	325

Remarks:

SRP = soluble reactive phosphorous (largely PO₄³⁻)

SUP = soluble unreactive phosphorous (organic forms of phosphorous and polyphosphates)

TP = "Total" phosphorous

Total phosphorous is largely defined on the basis of how much phosphorous in its various forms will be oxidized into orthophosphate by a specific oxidant.

Total phosphorous incorporates the total of all filterable and particulate phosphorous forms.

If a 0.45 micron cellulose (Millipore) filter was used it excluded most particulates, but colloidal phosphorous may be present in the filtered fraction.

Both FILTERED and UNFILTERED samples for the determination of phosphates were acidified.

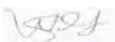
For details about date and time of sampling see Field Form

Acid Persulfate Digestion method was used

Analytical method: Ascorbic acid spectrophotometric method

Limit of detection: 0.02 to 2.50 mg/L PO₄³⁻

Approved by Head of Laboratory:




Drs. G. Wesenhagen

Date: January 6, 2012

Aanvraag nr: 4A, 4B, 4C, 4D

Aanvrager: Surgold (Ingrid Pradon)

Datum monsterontvangst: 1 maart 2012, 5 maart 2012, 6 maart 2012, 7 maart 2012

Aantal en soort monsters: in totaal 27 locaties in duplo

Bemonsterd door: aanvrager

Te analyseren op: zie onderstaand

Opmerking:

Door de grote hoeveelheid monsters die kort achter elkaar zijn aangeleverd kon niet alle TSS en TDS binnen 7 dagen geanalyseerd worden

Resultaten:

	Locatie	mg/L TSS	mg/L TDS
1 maart 2012	24FEB2012GW001	3	203
	24FEB2012GW001	1	249
	25FEB2012GW002	4	277
	25FEB2012GW002	3	312
	25FEB2012GW003	8	200
	25FEB2012GW003	5	254
	26FEB2012GW004	1	51
	26FEB2012GW004	2	47
	26FEB2012GW005	3	107
	26FEB2012GW005	2	121
	26FEB2012GW006	3	176
	26FEB2012GW006	6	229
	27FEB2012GW007	390	410
	27FEB2012GW007	320	413
	27FEB2012GW008	14	290
	27FEB2012GW008	15	389
	28FEB2012GW009	166	246
	28FEB2012GW009	160	252
	28FEB2012GW109	99	242
	28FEB2012GW109	65	241
5 maart 2012	02MAR2012SW002	22	45
	02MAR2012SW002	28	41
	02MAR2012SW001	78	50
	02MAR2012SW001	86	39
	02MAR2012SW003	531	167
	02MAR2012SW003	560	180
	02MAR2012SW004	720	165
	02MAR2012SW004	660	165
	02MAR2012SW006	25	135
	02MAR2012SW006	20	170
	02MAR2012SW005	20	170
	02MAR2012SW005	60	130
03MAR2012SW105	24	76	
03MAR2012SW105	24	71	

deze monsters komen niet voor op de aangeleverde lijst, maar zijn wel meegekomen

Aanvraag nr: 4A, 4B, 4C, 4D

Aanvrager: Surgold (Ingrid Pradon)

Datum monsterontvangst: 1 maart 2012, 5 maart 2012, 6 maart 2012, 7 maart 2012

Aantal en soort monsters: in totaal 27 locaties in duplo

Bemonsterd door: aanvrager

Te analyseren op: zie onderstaand

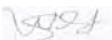
Opmerking:

Door de grote hoeveelheid monsters die kort achter elkaar zijn aangeleverd kon niet alle TSS en TDS binnen 7 dagen geanalyseerd worden

Resultaten:

	Locatie	mg/L TSS	mg/L TDS	
6 maart 2012	04MAR2012SW010	13	76	
	04MAR2012SW010	14	74	
	04MAR2012SW009	20	74	
	04MAR2012SW009	19	66	
	04MAR2012SW011	5	59	
	04MAR2012SW011	5	53	
	04MAR2012SW007	36	208	
	04MAR2012SW007	32	216	
	04MAR2012SW008	204	328	
	04MAR2012SW008	232	396	
7 maart 2012	05MAR2012SW012	100	117	
	05MAR2012SW012	141	210	
	05MAR2012SW013	6560	1260	
	05MAR2012SW013	6670	1120	
	05MAR2012SW113	niet ontvangen	niet ontvangen	deze monsters niet ontvangen
	05MAR2012SW113	niet ontvangen	niet ontvangen	
	05MAR2012SW014	71	105	
	05MAR2012SW014	75	111	
	05MAR2012SW201	1	22	
	05MAR2012SW201	3	19	
	05MAR2012SW015	316	304	
	05MAR2012SW015	412	348	

Accoord,



Gerda Wesenhagen
Hoofd chemisch lab en milieu lab van de FTeW

Request number: 6 a+b

Requester: Surgold (Ingrid Pradon)

Date samples received by the lab: March 30, and April 2, 2012

Number and type of samples: 10 groundwater locations, duplicate samples

Sampled by: requester

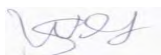
Parameters to be analyzed: see table below

Remark: none

Results:

	Location	TSS (mg/L)	TDS (mg/L)
March 30, 2012	27MAR2012GW001	5	123
	27MAR2012GW001	7	126
	27MAR2012GW002	6	60
	27MAR2012GW002	5	62
	27MAR2012GW003	5	254
	27MAR2012GW003	6	251
	28MAR2012GW004	160	980
	28MAR2012GW004	180	1020
	28MAR2012GW005	1	228
	28MAR2012GW005	1	228
	28MAR2012GW006	67	192
	28MAR2012GW006	90	193
	29MAR2012GW007	0	315
	29MAR2012GW007	0	298
April 2, 2012	29MAR2012GW107	1	299
	29MAR2012GW107	0	298
	29MAR2012GW008	0	383
	29MAR2012GW008	0	389
	30MAR2012GW009	0	312
30MAR2012GW009	0	329	

Agreed,



Gerda Wesenhagen

Head of the Chemistry lab and environmental lab of the
Faculty of Technology of the Anton de Kom university of Suriname

Telephone: 46 55 58 ext 301/310

Fax: 49 50 05

Request nr: 9 a+b

Requester: Surgold (Malcolm Asin)

Date samples received by the lab: April 27, and April 30, 2012

Number and type of samples: 9a: 6x2 locaties
9b: 4x2 locaties

Sampled by: requester

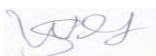
Parameters to be analyzed: see table below

Remark: none

Results:

	Location ID	mg/L TSS	mg/L TDS
27-Apr-12	24APR2012GW001	0	75
	24APR2012GW001	4	74
	24APR2012GW002	1	41
	24APR2012GW002	1	35
	24APR2012GW102	0	47
	24APR2012GW102	0	45
	24APR2012GW003	3	201
	24APR2012GW003	4	192
	25APR2012GW004	4	191
	25APR2012GW004	3	206
30-Apr-12	25APR2012GW005	170	120
	25APR2012GW005	180	120
	26APR2012GW006	3	264
	26APR2012GW006	2	273
	27APR2012GW007	270	210
	27APR2012GW007	280	190
	27APR2012GW008	5	323
	27APR2012GW008	3	325
	28APR2012GW009	3	319
	28APR2012GW009	2	314

Agreed,



Gerda Wesenhagen

Head of the Chemistry lab and environmental lab of the
Faculty of Technology of the Anton de Kom university of Suriname
Telephone: 46 55 58 ext 301/310
Fax: 49 50 05

Request number: 10 a+b

Requester: Surgold (Malcolm Asin)

Date samples received by the lab: May 18, and May 21, 2012

Number and type of samp 10a: 5x2 locations
10b: 5x2 locations

Sampled by: requester

Parameters to be analyzed: see table below

Remarks: no

Results:

	Location	mg/L TSS	mg/L TDS
May 18, 2012	15MAY2012GW001	7	279
	15MAY2012GW001	8	283
	15MAY2012GW101	1	265
	15MAY2012GW101	1	258
	16MAY2012GW002	1	118
	16MAY2012GW002	2	115
	16MAY2012GW003	2	67
	16MAY2012GW003	3	63
	16MAY2012GW004	6	209
	16MAY2012GW004	4	203
May 21, 2012	17MAY2012GW005	12	286
	17MAY2012GW005	11	291
	18MAY2012GW006	270	27
	18MAY2012GW006	250	30
	18MAY2012GW007	100	164
	18MAY2012GW007	107	168
	19MAY2012GW008	1	309
	19MAY2012GW008	1	305
	19MAY2012GW009	5	280
19MAY2012GW009	6	286	

Agreed,



G. Wesenhagen

Head of the Chemistry lab and environmental lab of the
Faculty of Technology of the Anton de Kom university of Suriname
Telephone: 46 55 58 ext 301/310
Fax: 49 50 05

SEDIMENT



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1K0635**

Reported: 30-Dec-11 10:51

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Sampled By	Date Received
11212011SD011	W1K0635-01	Soil	21-Nov-11 14:00	DH/JE	30-Nov-2011
11212011SD012	W1K0635-02	Soil	21-Nov-11 15:00	DH/JE	30-Nov-2011
11212011SD013	W1K0635-03	Soil	21-Nov-11 15:30	DH/JE	30-Nov-2011
11222011SD015	W1K0635-04	Soil	22-Nov-11 16:00	DH/JE	30-Nov-2011
11242011SD017	W1K0635-05	Soil	24-Nov-11 11:35	DH/JE	30-Nov-2011
11242011SD018	W1K0635-06	Soil	24-Nov-11 13:50	DH/JE	30-Nov-2011
11242011SD019	W1K0635-07	Soil	24-Nov-11 15:15	DH/JE	30-Nov-2011
11252011SD020	W1K0635-08	Soil	25-Nov-11 09:30	DH/JE	30-Nov-2011
11252011SD120	W1K0635-09	Soil	25-Nov-11 09:30	DH/JE	30-Nov-2011
11262011SD021	W1K0635-10	Soil	26-Nov-11 10:45	DH/JE	30-Nov-2011
11242011SD119	W1K0635-11	Soil	24-Nov-11 00:00	DH/JE	30-Nov-2011

Solid samples are analyzed on an as-received, wet-weight basis, unless otherwise requested. Non-Detects are reported at the MDL.

Sample preparation is defined by the client as per their Data Quality Objectives.

This report supercedes any previous reports for this Work Order. The complete report includes pages for each sample, a full QC report, and a notes section.

The results presented in this report relate only to the samples, and meet all requirements of the NELAC Standards unless otherwise noted.

Case Narrative

Samples were sieved through a #10 mesh sieve.



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Kellogg ID 83837-0929

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Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: **Suriname - Merian Gold 2011 / 113-93245**

Work Order: **W1K0635**

Reported: 30-Dec-11 10:51

Client Sample ID: **11212011SD011**

SVL Sample ID: **W1K0635-01 (Soil)**

Sample Report Page 1 of 1

Sampled: 21-Nov-11 14:00
Received: 30-Nov-11
Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total)										
EPA 6020	Arsenic	< 0.300	mg/kg	0.300	0.060	5	W151119	KWH	12/21/11 11:57	
EPA 6020	Cadmium	< 0.100	mg/kg	0.100	0.018	5	W151119	KWH	12/21/11 11:57	
EPA 6020	Lead	1.87	mg/kg	0.100	0.0125	5	W151119	KWH	12/21/11 11:57	
EPA 6020	Selenium	< 0.300	mg/kg	0.300	0.175	5	W151119	KWH	12/21/11 11:57	
EPA 6020	Silver	0.0524	mg/kg	0.0500	0.0085	5	W151119	KWH	12/21/11 11:57	
EPA 6020	Thallium	< 0.100	mg/kg	0.100	0.0033	5	W151119	KWH	12/21/11 11:57	

Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Aluminum	3530	mg/kg	8.0	1.6		W151120	AS	12/20/11 12:32	
EPA 6010B	Chromium	35.2	mg/kg	0.60	0.05		W151120	AS	12/20/11 12:33	
EPA 6010B	Copper	14.3	mg/kg	1.00	0.21		W151120	AS	12/20/11 12:33	
EPA 6010B	Iron	23300	mg/kg	6.0	1.1		W151120	AS	12/20/11 12:32	
EPA 6010B	Manganese	23.6	mg/kg	0.40	0.04		W151120	AS	12/20/11 12:32	
EPA 6010B	Nickel	1.65	mg/kg	1.00	0.22		W151120	AS	12/20/11 12:33	
EPA 6010B	Vanadium	31.8	mg/kg	0.50	0.04		W151120	AS	12/20/11 12:33	
EPA 6010B	Zinc	4.76	mg/kg	1.00	0.09		W151120	AS	12/20/11 12:34	
EPA 7471A	Mercury	0.185	mg/kg	0.033	0.007		W151146	DJA	12/16/11 16:17	

Classical Chemistry Parameters

SM 4500-CN-I	Cyanide (WAD)	< 0.500	mg/kg	0.500	0.065		W151143	CFE	12/20/11 12:12	H3
SW846 9012B	Cyanide (total)	< 0.50	mg/kg	0.50	0.10		W151140	CFE	12/19/11 16:04	H3
SW-846 9213	Cyanide (free)	2.19	mg/kg	1.00	0.09		W151144	IIT/C	12/29/11 15:15	H3
USDA HB60(24)	Total Organic Carbon	0.244	%	0.0900	0.0180		W151180	SM	12/20/11 14:52	
USDA HB60(24)	Total Organic Matter	0.421	%	0.150	0.0310		W151180	SM	12/20/11 14:52	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Kirby Gray
Technical Director



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: **Suriname - Merian Gold 2011 / 113-93245**

Work Order: **W1K0635**

Reported: 30-Dec-11 10:51

Client Sample ID: **11212011SD012**

SVL Sample ID: **W1K0635-02 (Soil)**

Sample Report Page 1 of 1

Sampled: 21-Nov-11 15:00

Received: 30-Nov-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total)										
EPA 6020	Arsenic	12.6	mg/kg	0.300	0.060	5	W151119	KWH	12/21/11 12:35	
EPA 6020	Cadmium	< 0.100	mg/kg	0.100	0.018	5	W151119	KWH	12/21/11 12:35	
EPA 6020	Lead	0.394	mg/kg	0.100	0.0125	5	W151119	KWH	12/21/11 12:35	
EPA 6020	Selenium	< 0.300	mg/kg	0.300	0.175	5	W151119	KWH	12/21/11 12:35	
EPA 6020	Silver	< 0.0500	mg/kg	0.0500	0.0085	5	W151119	KWH	12/21/11 12:35	
EPA 6020	Thallium	< 0.100	mg/kg	0.100	0.0033	5	W151119	KWH	12/21/11 12:35	

Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Aluminum	613	mg/kg	8.0	1.6		W151120	AS	12/20/11 12:47	
EPA 6010B	Chromium	6.07	mg/kg	0.60	0.05		W151120	AS	12/20/11 12:48	
EPA 6010B	Copper	1.54	mg/kg	1.00	0.21		W151120	AS	12/20/11 12:48	
EPA 6010B	Iron	4700	mg/kg	6.0	1.1		W151120	AS	12/20/11 12:47	
EPA 6010B	Manganese	4.74	mg/kg	0.40	0.04		W151120	AS	12/20/11 12:47	
EPA 6010B	Nickel	1.09	mg/kg	1.00	0.22		W151120	AS	12/20/11 12:48	
EPA 6010B	Vanadium	3.54	mg/kg	0.50	0.04		W151120	AS	12/20/11 12:48	
EPA 6010B	Zinc	1.29	mg/kg	1.00	0.09		W151120	AS	12/20/11 12:48	
EPA 7471A	Mercury	0.050	mg/kg	0.033	0.007		W151146	DJA	12/16/11 14:38	

Classical Chemistry Parameters

SM 4500-CN-I	Cyanide (WAD)	< 0.500	mg/kg	0.500	0.065		W151143	CFE	12/20/11 12:14	H3
SW846 9012B	Cyanide (total)	< 0.50	mg/kg	0.50	0.10		W151140	CFE	12/19/11 15:28	H3
SW-846 9213	Cyanide (free)	1.11	mg/kg	1.00	0.09		W151144	IIT/C	12/29/11 15:15	H3
USDA HB60(24)	Total Organic Carbon	< 0.0900	%	0.0900	0.0180		W151180	SM	12/20/11 14:52	
USDA HB60(24)	Total Organic Matter	< 0.150	%	0.150	0.0310		W151180	SM	12/20/11 14:52	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Kirby Gray
Technical Director



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: **Suriname - Merian Gold 2011 / 113-93245**

Work Order: **W1K0635**

Reported: 30-Dec-11 10:51

Client Sample ID: **11212011SD013**

SVL Sample ID: **W1K0635-03 (Soil)**

Sample Report Page 1 of 1

Sampled: 21-Nov-11 15:30

Received: 30-Nov-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 6020	Arsenic	3.53	mg/kg	0.300	0.060	5	W151119	KWH	12/21/11 12:41	
EPA 6020	Cadmium	< 0.100	mg/kg	0.100	0.018	5	W151119	KWH	12/21/11 12:41	
EPA 6020	Lead	2.75	mg/kg	0.100	0.0125	5	W151119	KWH	12/21/11 12:41	
EPA 6020	Selenium	0.835	mg/kg	0.300	0.175	5	W151119	KWH	12/21/11 12:41	
EPA 6020	Silver	< 0.0500	mg/kg	0.0500	0.0085	5	W151119	KWH	12/21/11 12:41	
EPA 6020	Thallium	< 0.100	mg/kg	0.100	0.0033	5	W151119	KWH	12/21/11 12:41	

Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Aluminum	3700	mg/kg	8.0	1.6		W151120	AS	12/20/11 12:52	
EPA 6010B	Chromium	31.7	mg/kg	0.60	0.05		W151120	AS	12/20/11 12:53	
EPA 6010B	Copper	11.4	mg/kg	1.00	0.21		W151120	AS	12/20/11 12:53	
EPA 6010B	Iron	14900	mg/kg	6.0	1.1		W151120	AS	12/20/11 12:52	
EPA 6010B	Manganese	14.3	mg/kg	0.40	0.04		W151120	AS	12/20/11 12:52	
EPA 6010B	Nickel	3.63	mg/kg	1.00	0.22		W151120	AS	12/20/11 12:53	
EPA 6010B	Vanadium	22.6	mg/kg	0.50	0.04		W151120	AS	12/20/11 12:53	
EPA 6010B	Zinc	6.05	mg/kg	1.00	0.09		W151120	AS	12/20/11 12:54	
EPA 7471A	Mercury	0.147	mg/kg	0.033	0.007		W151146	DJA	12/16/11 14:39	

Classical Chemistry Parameters

SM 4500-CN-I	Cyanide (WAD)	< 0.500	mg/kg	0.500	0.065		W151143	CFE	12/20/11 12:16	H3
SW846 9012B	Cyanide (total)	< 0.50	mg/kg	0.50	0.10		W151140	CFE	12/19/11 15:30	H3
SW-846 9213	Cyanide (free)	1.07	mg/kg	1.00	0.09		W151144	IIT/C	12/29/11 15:15	H3
USDA HB60(24)	Total Organic Carbon	0.668	%	0.0900	0.0180		W151180	SM	12/20/11 14:52	
USDA HB60(24)	Total Organic Matter	1.15	%	0.150	0.0310		W151180	SM	12/20/11 14:52	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Kirby Gray
Technical Director



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: **Suriname - Merian Gold 2011 / 113-93245**

Work Order: **W1K0635**

Reported: 30-Dec-11 10:51

Client Sample ID: **11222011SD015**

SVL Sample ID: **W1K0635-04 (Soil)**

Sampled: 22-Nov-11 16:00

Received: 30-Nov-11

Sampled By: DH/JE

Sample Report Page 1 of 1

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total)										
EPA 6020	Arsenic	0.392	mg/kg	0.300	0.060	5	W151119	KWH	12/21/11 12:46	
EPA 6020	Cadmium	< 0.100	mg/kg	0.100	0.018	5	W151119	KWH	12/21/11 12:46	
EPA 6020	Lead	2.33	mg/kg	0.100	0.0125	5	W151119	KWH	12/21/11 12:46	
EPA 6020	Selenium	0.754	mg/kg	0.300	0.175	5	W151119	KWH	12/21/11 12:46	
EPA 6020	Silver	< 0.0500	mg/kg	0.0500	0.0085	5	W151119	KWH	12/21/11 12:46	
EPA 6020	Thallium	< 0.100	mg/kg	0.100	0.0033	5	W151119	KWH	12/21/11 12:46	

Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Aluminum	3940	mg/kg	8.0	1.6		W151120	AS	12/20/11 12:57	
EPA 6010B	Chromium	16.8	mg/kg	0.60	0.05		W151120	AS	12/20/11 12:58	
EPA 6010B	Copper	11.4	mg/kg	1.00	0.21		W151120	AS	12/20/11 12:58	
EPA 6010B	Iron	8510	mg/kg	6.0	1.1		W151120	AS	12/20/11 12:57	
EPA 6010B	Manganese	14.9	mg/kg	0.40	0.04		W151120	AS	12/20/11 12:57	
EPA 6010B	Nickel	4.00	mg/kg	1.00	0.22		W151120	AS	12/20/11 12:58	
EPA 6010B	Vanadium	15.6	mg/kg	0.50	0.04		W151120	AS	12/20/11 12:58	
EPA 6010B	Zinc	5.83	mg/kg	1.00	0.09		W151120	AS	12/20/11 12:59	
EPA 7471A	Mercury	0.177	mg/kg	0.033	0.007		W151146	DJA	12/16/11 14:41	

Classical Chemistry Parameters

SM 4500-CN-I	Cyanide (WAD)	< 0.500	mg/kg	0.500	0.065		W151143	CFE	12/20/11 12:24	H3
SW846 9012B	Cyanide (total)	< 0.50	mg/kg	0.50	0.10		W151140	CFE	12/19/11 15:32	H3
SW-846 9213	Cyanide (free)	1.34	mg/kg	1.00	0.09		W151144	IIT/C	12/29/11 15:15	H3
USDA HB60(24)	Total Organic Carbon	1.03	%	0.0900	0.0180		W151180	SM	12/20/11 14:52	
USDA HB60(24)	Total Organic Matter	1.77	%	0.150	0.0310		W151180	SM	12/20/11 14:52	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Kirby Gray
Technical Director



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Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: **Suriname - Merian Gold 2011 / 113-93245**

Work Order: **W1K0635**

Reported: 30-Dec-11 10:51

Client Sample ID: **11242011SD017**

SVL Sample ID: **W1K0635-05 (Soil)**

Sampled: 24-Nov-11 11:35

Received: 30-Nov-11

Sampled By: DH/JE

Sample Report Page 1 of 1

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total)										
EPA 6020	Arsenic	0.346	mg/kg	0.300	0.060	5	W151119	KWH	12/21/11 12:52	
EPA 6020	Cadmium	< 0.100	mg/kg	0.100	0.018	5	W151119	KWH	12/21/11 12:52	
EPA 6020	Lead	0.878	mg/kg	0.100	0.0125	5	W151119	KWH	12/21/11 12:52	
EPA 6020	Selenium	0.710	mg/kg	0.300	0.175	5	W151119	KWH	12/21/11 12:52	
EPA 6020	Silver	< 0.0500	mg/kg	0.0500	0.0085	5	W151119	KWH	12/21/11 12:52	
EPA 6020	Thallium	< 0.100	mg/kg	0.100	0.0033	5	W151119	KWH	12/21/11 12:52	

Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Aluminum	717	mg/kg	8.0	1.6		W151120	AS	12/20/11 13:03	
EPA 6010B	Chromium	4.75	mg/kg	0.60	0.05		W151120	AS	12/20/11 13:04	
EPA 6010B	Copper	1.50	mg/kg	1.00	0.21		W151120	AS	12/20/11 13:04	
EPA 6010B	Iron	991	mg/kg	6.0	1.1		W151120	AS	12/20/11 13:03	
EPA 6010B	Manganese	2.25	mg/kg	0.40	0.04		W151120	AS	12/20/11 13:03	
EPA 6010B	Nickel	1.06	mg/kg	1.00	0.22		W151120	AS	12/20/11 13:04	
EPA 6010B	Vanadium	2.86	mg/kg	0.50	0.04		W151120	AS	12/20/11 13:04	
EPA 6010B	Zinc	2.03	mg/kg	1.00	0.09		W151120	AS	12/20/11 13:04	
EPA 7471A	Mercury	0.090	mg/kg	0.033	0.007		W151146	DJA	12/16/11 14:43	

Classical Chemistry Parameters

SM 4500-CN-I	Cyanide (WAD)	< 0.500	mg/kg	0.500	0.065		W151143	CFE	12/20/11 12:26	H3
SW846 9012B	Cyanide (total)	< 0.50	mg/kg	0.50	0.10		W151140	CFE	12/19/11 15:34	H3
SW-846 9213	Cyanide (free)	< 1.00	mg/kg	1.00	0.09		W151144	IIT/C	12/29/11 15:15	H3
USDA HB60(24)	Total Organic Carbon	< 0.0900	%	0.0900	0.0180		W151180	SM	12/20/11 14:52	
USDA HB60(24)	Total Organic Matter	< 0.150	%	0.150	0.0310		W151180	SM	12/20/11 14:52	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Kirby Gray
Technical Director



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: **Suriname - Merian Gold 2011 / 113-93245**

Work Order: **W1K0635**

Reported: 30-Dec-11 10:51

Client Sample ID: **11242011SD018**

SVL Sample ID: **W1K0635-06 (Soil)**

Sampled: 24-Nov-11 13:50

Received: 30-Nov-11

Sampled By: DH/JE

Sample Report Page 1 of 1

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total)										
EPA 6020	Arsenic	0.790	mg/kg	0.300	0.060	5	W151119	KWH	12/21/11 12:57	
EPA 6020	Cadmium	< 0.100	mg/kg	0.100	0.018	5	W151119	KWH	12/21/11 12:57	
EPA 6020	Lead	3.41	mg/kg	0.100	0.0125	5	W151119	KWH	12/21/11 12:57	
EPA 6020	Selenium	0.537	mg/kg	0.300	0.175	5	W151119	KWH	12/21/11 12:57	
EPA 6020	Silver	< 0.0500	mg/kg	0.0500	0.0085	5	W151119	KWH	12/21/11 12:57	
EPA 6020	Thallium	< 0.100	mg/kg	0.100	0.0033	5	W151119	KWH	12/21/11 12:57	

Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Aluminum	4950	mg/kg	8.0	1.6		W151120	AS	12/20/11 13:07	
EPA 6010B	Chromium	24.4	mg/kg	0.60	0.05		W151120	AS	12/20/11 13:09	
EPA 6010B	Copper	3.18	mg/kg	1.00	0.21		W151120	AS	12/20/11 13:09	
EPA 6010B	Iron	9160	mg/kg	6.0	1.1		W151120	AS	12/20/11 13:07	
EPA 6010B	Manganese	8.31	mg/kg	0.40	0.04		W151120	AS	12/20/11 13:08	
EPA 6010B	Nickel	1.85	mg/kg	1.00	0.22		W151120	AS	12/20/11 13:09	
EPA 6010B	Vanadium	19.2	mg/kg	0.50	0.04		W151120	AS	12/20/11 13:09	
EPA 6010B	Zinc	4.02	mg/kg	1.00	0.09		W151120	AS	12/20/11 13:09	
EPA 7471A	Mercury	0.095	mg/kg	0.033	0.007		W151146	DJA	12/16/11 14:44	

Classical Chemistry Parameters

SM 4500-CN-I	Cyanide (WAD)	< 0.500	mg/kg	0.500	0.065		W151143	CFE	12/20/11 12:28	H3
SW846 9012B	Cyanide (total)	< 0.50	mg/kg	0.50	0.10		W151140	CFE	12/19/11 15:36	H3
SW-846 9213	Cyanide (free)	< 1.00	mg/kg	1.00	0.09		W151144	IIT/C	12/29/11 15:15	H3
USDA HB60(24)	Total Organic Carbon	0.656	%	0.0900	0.0180		W151180	SM	12/20/11 14:52	
USDA HB60(24)	Total Organic Matter	1.13	%	0.150	0.0310		W151180	SM	12/20/11 14:52	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Kirby Gray
Technical Director



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Project Name: **Suriname - Merian Gold 2011 / 113-93245**

Work Order: **W1K0635**

Reported: 30-Dec-11 10:51

Client Sample ID: **11242011SD019**

SVL Sample ID: **W1K0635-07 (Soil)**

Sample Report Page 1 of 1

Sampled: 24-Nov-11 15:15

Received: 30-Nov-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 6020	Arsenic	0.342	mg/kg	0.300	0.060	5	W151119	KWH	12/21/11 13:03	
EPA 6020	Cadmium	< 0.100	mg/kg	0.100	0.018	5	W151119	KWH	12/21/11 13:03	
EPA 6020	Lead	3.36	mg/kg	0.100	0.0125	5	W151119	KWH	12/21/11 13:03	
EPA 6020	Selenium	0.781	mg/kg	0.300	0.175	5	W151119	KWH	12/21/11 13:03	
EPA 6020	Silver	< 0.0500	mg/kg	0.0500	0.0085	5	W151119	KWH	12/21/11 13:03	
EPA 6020	Thallium	< 0.100	mg/kg	0.100	0.0033	5	W151119	KWH	12/21/11 13:03	

Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Aluminum	3090	mg/kg	8.0	1.6		W151120	AS	12/20/11 13:23	
EPA 6010B	Chromium	24.6	mg/kg	0.60	0.05		W151120	AS	12/20/11 13:24	
EPA 6010B	Copper	14.2	mg/kg	1.00	0.21		W151120	AS	12/20/11 13:24	
EPA 6010B	Iron	13200	mg/kg	6.0	1.1		W151120	AS	12/20/11 13:23	
EPA 6010B	Manganese	39.1	mg/kg	0.40	0.04		W151120	AS	12/20/11 13:23	
EPA 6010B	Nickel	2.64	mg/kg	1.00	0.22		W151120	AS	12/20/11 13:24	
EPA 6010B	Vanadium	22.6	mg/kg	0.50	0.04		W151120	AS	12/20/11 13:24	
EPA 6010B	Zinc	15.0	mg/kg	1.00	0.09		W151120	AS	12/20/11 13:25	
EPA 7471A	Mercury	0.162	mg/kg	0.033	0.007		W151146	DJA	12/16/11 14:49	

Classical Chemistry Parameters

SM 4500-CN-I	Cyanide (WAD)	< 0.500	mg/kg	0.500	0.065		W151143	CFE	12/20/11 12:30	H3
SW846 9012B	Cyanide (total)	< 0.50	mg/kg	0.50	0.10		W151140	CFE	12/19/11 15:38	H3
SW-846 9213	Cyanide (free)	< 1.00	mg/kg	1.00	0.09		W151144	IIT/C	12/29/11 15:15	H3
USDA HB60(24)	Total Organic Carbon	0.704	%	0.0900	0.0180		W151180	SM	12/20/11 14:52	
USDA HB60(24)	Total Organic Matter	1.21	%	0.150	0.0310		W151180	SM	12/20/11 14:52	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Kirby Gray
Technical Director



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Project Name: **Suriname - Merian Gold 2011 / 113-93245**

Work Order: **W1K0635**

Reported: 30-Dec-11 10:51

Client Sample ID: **11252011SD020**

SVL Sample ID: **W1K0635-08 (Soil)**

Sample Report Page 1 of 1

Sampled: 25-Nov-11 09:30

Received: 30-Nov-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total)										
EPA 6020	Arsenic	1.65	mg/kg	0.300	0.060	5	W151119	KWH	12/21/11 13:08	
EPA 6020	Cadmium	< 0.100	mg/kg	0.100	0.018	5	W151119	KWH	12/21/11 13:08	
EPA 6020	Lead	1.06	mg/kg	0.100	0.0125	5	W151119	KWH	12/21/11 13:08	
EPA 6020	Selenium	< 0.300	mg/kg	0.300	0.175	5	W151119	KWH	12/21/11 13:08	
EPA 6020	Silver	< 0.0500	mg/kg	0.0500	0.0085	5	W151119	KWH	12/21/11 13:08	
EPA 6020	Thallium	< 0.100	mg/kg	0.100	0.0033	5	W151119	KWH	12/21/11 13:08	

Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Aluminum	1480	mg/kg	8.0	1.6		W151120	AS	12/20/11 13:28	
EPA 6010B	Chromium	9.17	mg/kg	0.60	0.05		W151120	AS	12/20/11 13:29	
EPA 6010B	Copper	2.36	mg/kg	1.00	0.21		W151120	AS	12/20/11 13:29	
EPA 6010B	Iron	4320	mg/kg	6.0	1.1		W151120	AS	12/20/11 13:28	
EPA 6010B	Manganese	13.4	mg/kg	0.40	0.04		W151120	AS	12/20/11 13:28	
EPA 6010B	Nickel	1.65	mg/kg	1.00	0.22		W151120	AS	12/20/11 13:29	
EPA 6010B	Vanadium	5.49	mg/kg	0.50	0.04		W151120	AS	12/20/11 13:29	
EPA 6010B	Zinc	2.44	mg/kg	1.00	0.09		W151120	AS	12/20/11 13:30	
EPA 7471A	Mercury	0.122	mg/kg	0.033	0.007		W151146	DJA	12/16/11 14:51	

Classical Chemistry Parameters

SM 4500-CN-I	Cyanide (WAD)	< 0.500	mg/kg	0.500	0.065		W151143	CFE	12/20/11 12:32	H3
SW846 9012B	Cyanide (total)	< 0.50	mg/kg	0.50	0.10		W151140	CFE	12/19/11 15:40	H3
SW-846 9213	Cyanide (free)	< 1.00	mg/kg	1.00	0.09		W151144	IIT/C	12/29/11 15:15	H3
USDA HB60(24)	Total Organic Carbon	0.120	%	0.0900	0.0180		W151180	SM	12/20/11 14:52	
USDA HB60(24)	Total Organic Matter	0.207	%	0.150	0.0310		W151180	SM	12/20/11 14:52	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Kirby Gray
Technical Director



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Project Name: **Suriname - Merian Gold 2011 / 113-93245**

Work Order: **W1K0635**

Reported: 30-Dec-11 10:51

Client Sample ID: **11252011SD120**

SVL Sample ID: **W1K0635-09 (Soil)**

Sample Report Page 1 of 1

Sampled: 25-Nov-11 09:30

Received: 30-Nov-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total)										
EPA 6020	Arsenic	1.62	mg/kg	0.300	0.060	5	W151119	KWH	12/21/11 13:14	
EPA 6020	Cadmium	< 0.100	mg/kg	0.100	0.018	5	W151119	KWH	12/21/11 13:14	
EPA 6020	Lead	1.01	mg/kg	0.100	0.0125	5	W151119	KWH	12/21/11 13:14	
EPA 6020	Selenium	< 0.300	mg/kg	0.300	0.175	5	W151119	KWH	12/21/11 13:14	
EPA 6020	Silver	< 0.0500	mg/kg	0.0500	0.0085	5	W151119	KWH	12/21/11 13:14	
EPA 6020	Thallium	< 0.100	mg/kg	0.100	0.0033	5	W151119	KWH	12/21/11 13:14	

Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Aluminum	1400	mg/kg	8.0	1.6		W151120	AS	12/20/11 13:33	
EPA 6010B	Chromium	8.73	mg/kg	0.60	0.05		W151120	AS	12/20/11 13:34	
EPA 6010B	Copper	2.16	mg/kg	1.00	0.21		W151120	AS	12/20/11 13:34	
EPA 6010B	Iron	4050	mg/kg	6.0	1.1		W151120	AS	12/20/11 13:33	
EPA 6010B	Manganese	12.4	mg/kg	0.40	0.04		W151120	AS	12/20/11 13:33	
EPA 6010B	Nickel	1.58	mg/kg	1.00	0.22		W151120	AS	12/20/11 13:34	
EPA 6010B	Vanadium	5.26	mg/kg	0.50	0.04		W151120	AS	12/20/11 13:34	
EPA 6010B	Zinc	2.24	mg/kg	1.00	0.09		W151120	AS	12/20/11 13:35	
EPA 7471A	Mercury	0.100	mg/kg	0.033	0.007		W151146	DJA	12/16/11 14:52	

Classical Chemistry Parameters

SM 4500-CN-I	Cyanide (WAD)	< 0.500	mg/kg	0.500	0.065		W151143	CFE	12/20/11 12:34	H3
SW846 9012B	Cyanide (total)	< 0.50	mg/kg	0.50	0.10		W151140	CFE	12/19/11 15:42	H3
SW-846 9213	Cyanide (free)	< 1.00	mg/kg	1.00	0.09		W151144	IIT/C	12/29/11 15:15	H3
USDA HB60(24)	Total Organic Carbon	0.158	%	0.0900	0.0180		W151180	SM	12/20/11 14:52	
USDA HB60(24)	Total Organic Matter	0.273	%	0.150	0.0310		W151180	SM	12/20/11 14:52	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Kirby Gray
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Project Name: **Suriname - Merian Gold 2011 / 113-93245**

Work Order: **W1K0635**

Reported: 30-Dec-11 10:51

Client Sample ID: **11262011SD021**

SVL Sample ID: **W1K0635-10 (Soil)**

Sample Report Page 1 of 1

Sampled: 26-Nov-11 10:45

Received: 30-Nov-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total)										
EPA 6020	Arsenic	0.365	mg/kg	0.300	0.060	5	W151119	KWH	12/21/11 13:19	
EPA 6020	Cadmium	< 0.100	mg/kg	0.100	0.018	5	W151119	KWH	12/21/11 13:19	
EPA 6020	Lead	1.18	mg/kg	0.100	0.0125	5	W151119	KWH	12/21/11 13:19	
EPA 6020	Selenium	< 0.300	mg/kg	0.300	0.175	5	W151119	KWH	12/21/11 13:19	
EPA 6020	Silver	< 0.0500	mg/kg	0.0500	0.0085	5	W151119	KWH	12/21/11 13:19	
EPA 6020	Thallium	< 0.100	mg/kg	0.100	0.0033	5	W151119	KWH	12/21/11 13:19	

Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Aluminum	882	mg/kg	8.0	1.6		W151120	AS	12/20/11 13:39	
EPA 6010B	Chromium	5.01	mg/kg	0.60	0.05		W151120	AS	12/20/11 13:40	
EPA 6010B	Copper	1.28	mg/kg	1.00	0.21		W151120	AS	12/20/11 13:40	
EPA 6010B	Iron	1060	mg/kg	6.0	1.1		W151120	AS	12/20/11 13:39	
EPA 6010B	Manganese	11.2	mg/kg	0.40	0.04		W151120	AS	12/20/11 13:39	
EPA 6010B	Nickel	1.13	mg/kg	1.00	0.22		W151120	AS	12/20/11 13:40	
EPA 6010B	Vanadium	2.27	mg/kg	0.50	0.04		W151120	AS	12/20/11 13:40	
EPA 6010B	Zinc	1.70	mg/kg	1.00	0.09		W151120	AS	12/20/11 13:40	
EPA 7471A	Mercury	< 0.033	mg/kg	0.033	0.007		W151146	DJA	12/16/11 14:54	

Classical Chemistry Parameters

SM 4500-CN-I	Cyanide (WAD)	< 0.500	mg/kg	0.500	0.065		W151143	CFE	12/20/11 12:36	H3
SW846 9012B	Cyanide (total)	< 0.50	mg/kg	0.50	0.10		W151140	CFE	12/19/11 15:44	H3
SW-846 9213	Cyanide (free)	< 1.00	mg/kg	1.00	0.09		W151144	IIT/C	12/29/11 15:15	H3
USDA HB60(24)	Total Organic Carbon	0.285	%	0.0900	0.0180		W151180	SM	12/20/11 14:52	
USDA HB60(24)	Total Organic Matter	0.491	%	0.150	0.0310		W151180	SM	12/20/11 14:52	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

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Project Name: **Suriname - Merian Gold 2011 / 113-93245**

Work Order: **W1K0635**

Reported: 30-Dec-11 10:51

Client Sample ID: **11242011SD119**

SVL Sample ID: **W1K0635-11 (Soil)**

Sample Report Page 1 of 1

Sampled: 24-Nov-11 00:00

Received: 30-Nov-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total)										
EPA 6020	Arsenic	0.324	mg/kg	0.300	0.060	5	W151119	KWH	12/21/11 13:25	
EPA 6020	Cadmium	< 0.100	mg/kg	0.100	0.018	5	W151119	KWH	12/21/11 13:25	
EPA 6020	Lead	2.64	mg/kg	0.100	0.0125	5	W151119	KWH	12/21/11 13:25	
EPA 6020	Selenium	0.721	mg/kg	0.300	0.175	5	W151119	KWH	12/21/11 13:25	
EPA 6020	Silver	< 0.0500	mg/kg	0.0500	0.0085	5	W151119	KWH	12/21/11 13:25	
EPA 6020	Thallium	< 0.100	mg/kg	0.100	0.0033	5	W151119	KWH	12/21/11 13:25	

Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Aluminum	2900	mg/kg	8.0	1.6		W151120	AS	12/20/11 13:44	
EPA 6010B	Chromium	24.5	mg/kg	0.60	0.05		W151120	AS	12/20/11 13:45	
EPA 6010B	Copper	13.9	mg/kg	1.00	0.21		W151120	AS	12/20/11 13:45	
EPA 6010B	Iron	13100	mg/kg	6.0	1.1		W151120	AS	12/20/11 13:44	
EPA 6010B	Manganese	37.5	mg/kg	0.40	0.04		W151120	AS	12/20/11 13:44	
EPA 6010B	Nickel	2.45	mg/kg	1.00	0.22		W151120	AS	12/20/11 13:45	
EPA 6010B	Vanadium	22.3	mg/kg	0.50	0.04		W151120	AS	12/20/11 13:45	
EPA 6010B	Zinc	6.27	mg/kg	1.00	0.09		W151120	AS	12/20/11 13:45	
EPA 7471A	Mercury	0.152	mg/kg	0.033	0.007		W151146	DJA	12/16/11 14:56	

Classical Chemistry Parameters

SM 4500-CN-I	Cyanide (WAD)	< 0.500	mg/kg	0.500	0.065		W151143	CFE	12/20/11 12:38	H3
SW846 9012B	Cyanide (total)	< 0.50	mg/kg	0.50	0.10		W151140	CFE	12/19/11 15:46	H3
SW-846 9213	Cyanide (free)	< 1.00	mg/kg	1.00	0.09		W151144	IIT/C	12/29/11 15:15	H3
USDA HB60(24)	Total Organic Carbon	0.481	%	0.0900	0.0180		W151180	SM	12/20/11 14:52	
USDA HB60(24)	Total Organic Matter	0.829	%	0.150	0.0310		W151180	SM	12/20/11 14:52	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Kirby Gray
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Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245
Work Order: **W1K0635**
Reported: 30-Dec-11 10:51

Quality Control - BLANK Data

Method	Analyte	Units	Result	MDL	MRL	Batch ID	Analyzed	Notes
Metals (Total)								
EPA 6020	Arsenic	mg/kg	<0.300	0.060	0.300	W151119	21-Dec-11	
EPA 6020	Cadmium	mg/kg	<0.100	0.018	0.100	W151119	21-Dec-11	
EPA 6020	Lead	mg/kg	<0.100	0.0125	0.100	W151119	21-Dec-11	
EPA 6020	Selenium	mg/kg	<0.300	0.175	0.300	W151119	21-Dec-11	
EPA 6020	Silver	mg/kg	<0.0500	0.0085	0.0500	W151119	21-Dec-11	
EPA 6020	Thallium	mg/kg	<0.100	0.0033	0.100	W151119	21-Dec-11	

Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Aluminum	mg/kg	<8.0	1.6	8.0	W151120	20-Dec-11	
EPA 6010B	Chromium	mg/kg	<0.60	0.05	0.60	W151120	20-Dec-11	
EPA 6010B	Copper	mg/kg	<1.00	0.21	1.00	W151120	20-Dec-11	
EPA 6010B	Iron	mg/kg	<6.0	1.1	6.0	W151120	20-Dec-11	
EPA 6010B	Manganese	mg/kg	<0.40	0.04	0.40	W151120	20-Dec-11	
EPA 6010B	Nickel	mg/kg	<1.00	0.22	1.00	W151120	20-Dec-11	
EPA 6010B	Vanadium	mg/kg	<0.50	0.04	0.50	W151120	20-Dec-11	
EPA 6010B	Zinc	mg/kg	<1.00	0.09	1.00	W151120	20-Dec-11	
EPA 7471A	Mercury	mg/kg	<0.033	0.007	0.033	W151146	16-Dec-11	

Classical Chemistry Parameters

SM 4500-CN-I	Cyanide (WAD)	mg/kg	<0.500	0.065	0.500	W151143	20-Dec-11	
SW846 9012B	Cyanide (total)	mg/kg	<0.50	0.10	0.50	W151140	19-Dec-11	
SW-846 9213	Cyanide (free)	mg/kg	<1.00	0.09	1.00	W151144	29-Dec-11	
USDA HB60(24)	Total Organic Matter	%	<0.150	0.0310	0.150	W151180	20-Dec-11	
USDA HB60(24)	Total Organic Carbon	%	<0.0900	0.0180	0.0900	W151180	20-Dec-11	

Quality Control - LABORATORY CONTROL SAMPLE Data

Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
Metals (Total)									
EPA 6020	Arsenic	mg/kg	2.79	2.50	111	80 - 120	W151119	21-Dec-11	
EPA 6020	Cadmium	mg/kg	2.73	2.50	109	80 - 120	W151119	21-Dec-11	
EPA 6020	Lead	mg/kg	2.57	2.50	103	80 - 120	W151119	21-Dec-11	
EPA 6020	Selenium	mg/kg	2.74	2.50	110	80 - 120	W151119	21-Dec-11	
EPA 6020	Silver	mg/kg	2.62	2.50	105	80 - 120	W151119	21-Dec-11	
EPA 6020	Thallium	mg/kg	2.57	2.50	103	80 - 120	W151119	21-Dec-11	

Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Aluminum	mg/kg	94.8	100	94.8	80 - 120	W151120	20-Dec-11	
EPA 6010B	Chromium	mg/kg	93.9	100	93.9	80 - 120	W151120	20-Dec-11	
EPA 6010B	Copper	mg/kg	94.6	100	94.6	80 - 120	W151120	20-Dec-11	
EPA 6010B	Iron	mg/kg	938	1000	93.8	80 - 120	W151120	20-Dec-11	
EPA 6010B	Manganese	mg/kg	94.0	100	94.0	80 - 120	W151120	20-Dec-11	
EPA 6010B	Nickel	mg/kg	87.9	100	87.9	80 - 120	W151120	20-Dec-11	
EPA 6010B	Vanadium	mg/kg	95.5	100	95.5	80 - 120	W151120	20-Dec-11	
EPA 6010B	Zinc	mg/kg	88.7	100	88.7	80 - 120	W151120	20-Dec-11	
EPA 7471A	Mercury	mg/kg	0.858	0.833	103	80 - 120	W151146	16-Dec-11	

Classical Chemistry Parameters

SM 4500-CN-I	Cyanide (WAD)	mg/kg	1.58	1.50	105	80 - 120	W151143	20-Dec-11	
SW846 9012B	Cyanide (total)	mg/kg	8.70	9.60	90.6	80 - 120	W151140	19-Dec-11	
SW-846 9213	Cyanide (free)	mg/kg	10.4	10.0	104	85 - 115	W151144	29-Dec-11	
USDA HB60(24)	Total Organic Matter	%	0.500	0.464	108	80 - 120	W151180	20-Dec-11	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



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Project Name: Suriname - Merian Gold 2011 / 113-93245
Work Order: **W1K0635**
Reported: 30-Dec-11 10:51

Quality Control - LABORATORY CONTROL SAMPLE Data (Continued)

Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Classical Chemistry Parameters (Continued)

USDA HB60(24)	Total Organic Carbon	%	0.290	0.269	108	80 - 120	W151180	20-Dec-11	
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Quality Control - DUPLICATE Data

Method	Analyte	Units	Duplicate Result	Sample Result	RPD	RPD Limit	Batch ID	Analyzed	Notes
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Metals (Total)

EPA 6020	Arsenic	mg/kg	<0.300	<0.300	<RL	20	W151119	21-Dec-11	
EPA 6020	Cadmium	mg/kg	<0.100	<0.100	UDL	20	W151119	21-Dec-11	
EPA 6020	Lead	mg/kg	1.77	1.87	5.8	20	W151119	21-Dec-11	
EPA 6020	Selenium	mg/kg	<0.300	<0.300	<RL	20	W151119	21-Dec-11	
EPA 6020	Silver	mg/kg	0.0580	0.0524	10.1	20	W151119	21-Dec-11	
EPA 6020	Thallium	mg/kg	<0.100	<0.100	<RL	20	W151119	21-Dec-11	

Classical Chemistry Parameters

SM 4500-CN-1	Cyanide (WAD)	mg/kg	<0.500	<0.500	UDL	20	W151143	20-Dec-11	
SW846 9012B	Cyanide (total)	mg/kg	<0.50	<0.50	UDL	20	W151140	19-Dec-11	
SW-846 9213	Cyanide (free)	mg/kg	1.89	2.19	14.7	20	W151144	29-Dec-11	
USDA HB60(24)	Total Organic Matter	%	0.888	0.829	6.8	20	W151180	20-Dec-11	
USDA HB60(24)	Total Organic Carbon	%	0.515	0.481	6.8	20	W151180	20-Dec-11	

Quality Control - MATRIX SPIKE Data

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Total)

EPA 6020	Arsenic	mg/kg	1.08	<0.300	2.50	38.0	75 - 125	W151119	21-Dec-11	M3
EPA 6020	Cadmium	mg/kg	2.58	<0.100	2.50	103	75 - 125	W151119	21-Dec-11	
EPA 6020	Lead	mg/kg	4.21	1.87	2.50	93.6	75 - 125	W151119	21-Dec-11	
EPA 6020	Selenium	mg/kg	0.925	<0.300	2.50	29.1	75 - 125	W151119	21-Dec-11	M3
EPA 6020	Silver	mg/kg	2.48	0.0524	2.50	97.2	75 - 125	W151119	21-Dec-11	
EPA 6020	Thallium	mg/kg	2.40	<0.100	2.50	95.4	75 - 125	W151119	21-Dec-11	

Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Aluminum	mg/kg	11800	3530	100	R > 4S	75 - 125	W151120	20-Dec-11	M3
EPA 6010B	Chromium	mg/kg	131	35.2	100	96.3	75 - 125	W151120	20-Dec-11	
EPA 6010B	Copper	mg/kg	113	14.3	100	99.1	75 - 125	W151120	20-Dec-11	
EPA 6010B	Iron	mg/kg	23800	23300	1000	R > 4S	75 - 125	W151120	20-Dec-11	M3
EPA 6010B	Manganese	mg/kg	114	23.6	100	90.8	75 - 125	W151120	20-Dec-11	
EPA 6010B	Nickel	mg/kg	92.3	1.65	100	90.6	75 - 125	W151120	20-Dec-11	
EPA 6010B	Vanadium	mg/kg	126	31.8	100	94.2	75 - 125	W151120	20-Dec-11	
EPA 6010B	Zinc	mg/kg	93.7	4.76	100	89.0	75 - 125	W151120	20-Dec-11	
EPA 7471A	Mercury	mg/kg	0.375	0.185	0.167	114	75 - 125	W151146	16-Dec-11	

Classical Chemistry Parameters

SM 4500-CN-1	Cyanide (WAD)	mg/kg	0.970	<0.500	1.00	97.0	75 - 125	W151143	20-Dec-11	
SM 4500-CN-1	Cyanide (WAD)	mg/kg	1.03	<0.500	1.00	103	75 - 125	W151143	20-Dec-11	
SW846 9012B	Cyanide (total)	mg/kg	12.0	10.3	1.00	R > 4S	90 - 110	W151140	19-Dec-11	D2,M3
SW846 9012B	Cyanide (total)	mg/kg	1.07	<0.50	1.00	107	90 - 110	W151140	19-Dec-11	
SW-846 9213	Cyanide (free)	mg/kg	11.4	<1.00	10.0	105	85 - 115	W151144	29-Dec-11	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



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Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1K0635**

Reported: 30-Dec-11 10:51

Quality Control - MATRIX SPIKE Data (Continued)

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Classical Chemistry Parameters (Continued)

SW-846 9213	Cyanide (free)	mg/kg	12.9	2.19	10.0	107	85 - 115	W151144	29-Dec-11	
USDA HB60(24)	Total Organic Matter	%	4.03	0.829	2.92	110	75 - 125	W151180	20-Dec-11	
USDA HB60(24)	Total Organic Carbon	%	2.34	0.481	1.69	110	75 - 125	W151180	20-Dec-11	

Quality Control - MATRIX SPIKE DUPLICATE Data

Method	Analyte	Units	MSD Result	Spike Result	Spike Level	RPD	RPD Limit	Batch ID	Analyzed	Notes
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Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Aluminum	mg/kg	11000	11800	100	6.9	20	W151120	20-Dec-11	
EPA 6010B	Chromium	mg/kg	128	131	100	2.6	20	W151120	20-Dec-11	
EPA 6010B	Copper	mg/kg	112	113	100	1.4	20	W151120	20-Dec-11	
EPA 6010B	Iron	mg/kg	22700	23800	1000	4.5	20	W151120	20-Dec-11	
EPA 6010B	Manganese	mg/kg	112	114	100	2.4	20	W151120	20-Dec-11	
EPA 6010B	Nickel	mg/kg	90.2	92.3	100	2.3	20	W151120	20-Dec-11	
EPA 6010B	Vanadium	mg/kg	123	126	100	2.7	20	W151120	20-Dec-11	
EPA 6010B	Zinc	mg/kg	92.1	93.7	100	1.7	20	W151120	20-Dec-11	
EPA 7471A	Mercury	mg/kg	0.347	0.375	0.167	7.9	20	W151146	16-Dec-11	

Classical Chemistry Parameters

SW846 9012B	Cyanide (total)	mg/kg	1.09	1.07	1.00	1.9	20	W151140	19-Dec-11	
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Quality Control - POST DIGESTION SPIKE Data

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Total)

EPA 6020	Arsenic	mg/kg	2.63	<0.300	2.50	99.9	75 - 125	W151119	21-Dec-11	
EPA 6020	Cadmium	mg/kg	2.51	<0.100	2.50	100	75 - 125	W151119	21-Dec-11	
EPA 6020	Lead	mg/kg	4.22	1.87	2.50	94.0	75 - 125	W151119	21-Dec-11	
EPA 6020	Selenium	mg/kg	2.81	<0.300	2.50	105	75 - 125	W151119	21-Dec-11	
EPA 6020	Silver	mg/kg	2.40	0.0524	2.50	94.0	75 - 125	W151119	21-Dec-11	
EPA 6020	Thallium	mg/kg	2.39	<0.1000	2.50	95.3	75 - 125	W151119	21-Dec-11	



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Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1K0635**

Reported: 30-Dec-11 10:51

Notes and Definitions

D2	Sample required dilution due to high concentration of target analyte.
H3	Sample was received and analyzed past holding time.
M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to spike level. The LCS was acceptable.
LCS	Laboratory Control Sample (Blank Spike)
RPD	Relative Percent Difference
UDL	A result is less than the detection limit
R > 4S	% recovery not applicable, sample concentration more than four times greater than spike level
<RL	A result is less than the reporting limit
MRL	Method Reporting Limit
MDL	Method Detection Limit
N/A	Not Applicable



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0027**

Reported: 30-Dec-11 10:53

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Sampled By	Date Received
11162011SD001	W1L0027-01	Soil	16-Nov-11 10:30	DH/JE	01-Dec-2011
11162011SW002	W1L0027-02	Soil	16-Nov-11 11:00	DH/JE	01-Dec-2011
11162011SW003	W1L0027-03	Soil	16-Nov-11 12:00	DH/JE	01-Dec-2011
11162011SW004	W1L0027-04	Soil	16-Nov-11 12:00	DH/JE	01-Dec-2011
11202011SW006	W1L0027-05	Soil	20-Nov-11 11:15	DH/JE	01-Dec-2011
11202011SW007	W1L0027-06	Soil	20-Nov-11 13:15	DH/JE	01-Dec-2011
11202011SW008	W1L0027-07	Soil	20-Nov-11 14:40	DH/JE	01-Dec-2011

Solid samples are analyzed on an as-received, wet-weight basis, unless otherwise requested. Non-Detects are reported at the MDL.

Sample preparation is defined by the client as per their Data Quality Objectives.

This report supercedes any previous reports for this Work Order. The complete report includes pages for each sample, a full QC report, and a notes section.

The results presented in this report relate only to the samples, and meet all requirements of the NELAC Standards unless otherwise noted.

Case Narrative

Samples were sieved through a #10 mesh sieve.



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Kellogg ID 83837-0929

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Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: **Suriname - Merian Gold 2011 / 113-93245**

Work Order: **W1L0027**

Reported: 30-Dec-11 10:53

Client Sample ID: **11162011SD001**

SVL Sample ID: **W1L0027-01 (Soil)**

Sample Report Page 1 of 1

Sampled: 16-Nov-11 10:30

Received: 01-Dec-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total)										
EPA 6020	Arsenic	0.760	mg/kg	0.300	0.060	5	W151126	KWH	12/21/11 10:35	
EPA 6020	Cadmium	< 0.100	mg/kg	0.100	0.018	5	W151126	KWH	12/21/11 10:35	
EPA 6020	Lead	1.73	mg/kg	0.100	0.0125	5	W151126	KWH	12/21/11 10:35	
EPA 6020	Selenium	0.469	mg/kg	0.300	0.175	5	W151126	KWH	12/21/11 10:35	
EPA 6020	Silver	< 0.0500	mg/kg	0.0500	0.0085	5	W151126	KWH	12/21/11 10:35	
EPA 6020	Thallium	< 0.100	mg/kg	0.100	0.0033	5	W151126	KWH	12/21/11 10:35	

Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Aluminum	1970	mg/kg	8.0	1.6		W151166	AS	12/20/11 15:37	
EPA 6010B	Chromium	8.44	mg/kg	0.60	0.05		W151166	AS	12/20/11 15:38	
EPA 6010B	Copper	2.01	mg/kg	1.00	0.21		W151166	AS	12/20/11 15:38	
EPA 6010B	Iron	6050	mg/kg	6.0	1.1		W151166	AS	12/20/11 15:36	
EPA 6010B	Manganese	17.9	mg/kg	0.40	0.04		W151166	AS	12/20/11 15:37	
EPA 6010B	Nickel	1.05	mg/kg	1.00	0.22		W151166	AS	12/20/11 15:38	
EPA 6010B	Vanadium	7.99	mg/kg	0.50	0.04		W151166	AS	12/20/11 15:38	
EPA 6010B	Zinc	2.40	mg/kg	1.00	0.09		W151166	AS	12/20/11 15:38	
EPA 7471A	Mercury	< 0.033	mg/kg	0.033	0.007		W151146	DJA	12/16/11 14:57	H1

Classical Chemistry Parameters

SM 4500-CN-I	Cyanide (WAD)	< 0.500	mg/kg	0.500	0.065		W151143	CFE	12/20/11 12:40	H3
SW846 9012B	Cyanide (total)	< 0.50	mg/kg	0.50	0.10		W151140	CFE	12/19/11 16:12	H3
SW-846 9213	Cyanide (free)	< 1.00	mg/kg	1.00	0.09		W151144	IIT/C	12/29/11 15:15	H3
USDA HB60(24)	Total Organic Carbon	0.303	%	0.0900	0.0180		W151180	SM	12/20/11 14:52	
USDA HB60(24)	Total Organic Matter	0.523	%	0.150	0.0310		W151180	SM	12/20/11 14:52	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Kirby Gray
Technical Director



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Project Name: **Suriname - Merian Gold 2011 / 113-93245**

Work Order: **W1L0027**

Reported: 30-Dec-11 10:53

Client Sample ID: **11162011SW002**

SVL Sample ID: **W1L0027-02 (Soil)**

Sampled: 16-Nov-11 11:00

Received: 01-Dec-11

Sampled By: DH/JE

Sample Report Page 1 of 1

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total)										
EPA 6020	Arsenic	0.468	mg/kg	0.300	0.060	5	W151126	KWH	12/21/11 11:02	
EPA 6020	Cadmium	< 0.100	mg/kg	0.100	0.018	5	W151126	KWH	12/21/11 11:02	
EPA 6020	Lead	0.394	mg/kg	0.100	0.0125	5	W151126	KWH	12/21/11 11:02	
EPA 6020	Selenium	< 0.300	mg/kg	0.300	0.175	5	W151126	KWH	12/21/11 11:02	
EPA 6020	Silver	< 0.0500	mg/kg	0.0500	0.0085	5	W151126	KWH	12/21/11 11:02	
EPA 6020	Thallium	< 0.100	mg/kg	0.100	0.0033	5	W151126	KWH	12/21/11 11:02	

Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Aluminum	439	mg/kg	8.0	1.6		W151166	AS	12/20/11 15:52	
EPA 6010B	Chromium	2.03	mg/kg	0.60	0.05		W151166	AS	12/20/11 15:53	
EPA 6010B	Copper	< 1.00	mg/kg	1.00	0.21		W151166	AS	12/20/11 15:53	
EPA 6010B	Iron	1900	mg/kg	6.0	1.1		W151166	AS	12/20/11 15:52	
EPA 6010B	Manganese	21.7	mg/kg	0.40	0.04		W151166	AS	12/20/11 15:52	
EPA 6010B	Nickel	< 1.00	mg/kg	1.00	0.22		W151166	AS	12/20/11 15:53	
EPA 6010B	Vanadium	1.75	mg/kg	0.50	0.04		W151166	AS	12/20/11 15:53	
EPA 6010B	Zinc	1.53	mg/kg	1.00	0.09		W151166	AS	12/20/11 15:54	
EPA 7471A	Mercury	0.990	mg/kg	0.033	0.007		W151146	DJA	12/16/11 14:59	H1

Classical Chemistry Parameters

SM 4500-CN-I	Cyanide (WAD)	< 0.500	mg/kg	0.500	0.065		W151143	CFE	12/20/11 12:42	H3
SW846 9012B	Cyanide (total)	< 0.50	mg/kg	0.50	0.10		W151140	CFE	12/19/11 16:14	H3
SW-846 9213	Cyanide (free)	< 1.00	mg/kg	1.00	0.09		W151144	IIT/C	12/29/11 15:15	H3
USDA HB60(24)	Total Organic Carbon	0.349	%	0.0900	0.0180		W151180	SM	12/20/11 14:52	
USDA HB60(24)	Total Organic Matter	0.602	%	0.150	0.0310		W151180	SM	12/20/11 14:52	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Kirby Gray
Technical Director



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Project Name: **Suriname - Merian Gold 2011 / 113-93245**

Work Order: **W1L0027**

Reported: 30-Dec-11 10:53

Client Sample ID: **11162011SW003**

SVL Sample ID: **W1L0027-03 (Soil)**

Sampled: 16-Nov-11 12:00

Received: 01-Dec-11

Sampled By: DH/JE

Sample Report Page 1 of 1

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total)										
EPA 6020	Arsenic	0.392	mg/kg	0.300	0.060	5	W151126	KWH	12/21/11 11:08	
EPA 6020	Cadmium	< 0.100	mg/kg	0.100	0.018	5	W151126	KWH	12/21/11 11:08	
EPA 6020	Lead	0.742	mg/kg	0.100	0.0125	5	W151126	KWH	12/21/11 11:08	
EPA 6020	Selenium	< 0.300	mg/kg	0.300	0.175	5	W151126	KWH	12/21/11 11:08	
EPA 6020	Silver	< 0.0500	mg/kg	0.0500	0.0085	5	W151126	KWH	12/21/11 11:08	
EPA 6020	Thallium	< 0.100	mg/kg	0.100	0.0033	5	W151126	KWH	12/21/11 11:08	

Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Aluminum	1210	mg/kg	8.0	1.6		W151166	AS	12/20/11 15:57	
EPA 6010B	Chromium	10.5	mg/kg	0.60	0.05		W151166	AS	12/20/11 15:58	
EPA 6010B	Copper	4.08	mg/kg	1.00	0.21		W151166	AS	12/20/11 15:58	
EPA 6010B	Iron	5890	mg/kg	6.0	1.1		W151166	AS	12/20/11 15:57	
EPA 6010B	Manganese	4.79	mg/kg	0.40	0.04		W151166	AS	12/20/11 15:57	
EPA 6010B	Nickel	1.33	mg/kg	1.00	0.22		W151166	AS	12/20/11 15:58	
EPA 6010B	Vanadium	9.34	mg/kg	0.50	0.04		W151166	AS	12/20/11 15:58	
EPA 6010B	Zinc	3.69	mg/kg	1.00	0.09		W151166	AS	12/20/11 15:59	
EPA 7471A	Mercury	0.065	mg/kg	0.033	0.007		W151146	DJA	12/16/11 15:00	H1

Classical Chemistry Parameters

SM 4500-CN-I	Cyanide (WAD)	< 0.500	mg/kg	0.500	0.065		W151143	CFE	12/20/11 12:50	H3
SW846 9012B	Cyanide (total)	< 0.50	mg/kg	0.50	0.10		W151140	CFE	12/19/11 16:16	H3
SW-846 9213	Cyanide (free)	< 1.00	mg/kg	1.00	0.09		W151144	IIT/C	12/29/11 15:15	H3
USDA HB60(24)	Total Organic Carbon	0.297	%	0.0900	0.0180		W151180	SM	12/20/11 14:52	
USDA HB60(24)	Total Organic Matter	0.511	%	0.150	0.0310		W151180	SM	12/20/11 14:52	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Kirby Gray
Technical Director



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: **Suriname - Merian Gold 2011 / 113-93245**

Work Order: **W1L0027**

Reported: 30-Dec-11 10:53

Client Sample ID: **11162011SW004**

SVL Sample ID: **W1L0027-04 (Soil)**

Sampled: 16-Nov-11 12:00

Received: 01-Dec-11

Sampled By: DH/JE

Sample Report Page 1 of 1

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total)										
EPA 6020	Arsenic	22.7	mg/kg	0.300	0.060	5	W151126	KWH	12/21/11 11:13	
EPA 6020	Cadmium	< 0.100	mg/kg	0.100	0.018	5	W151126	KWH	12/21/11 11:13	
EPA 6020	Lead	7.13	mg/kg	0.100	0.0125	5	W151126	KWH	12/21/11 11:13	
EPA 6020	Selenium	0.532	mg/kg	0.300	0.175	5	W151126	KWH	12/21/11 11:13	
EPA 6020	Silver	< 0.0500	mg/kg	0.0500	0.0085	5	W151126	KWH	12/21/11 11:13	
EPA 6020	Thallium	< 0.100	mg/kg	0.100	0.0033	5	W151126	KWH	12/21/11 11:13	

Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Aluminum	3630	mg/kg	8.0	1.6		W151166	AS	12/20/11 16:02	
EPA 6010B	Chromium	72.5	mg/kg	0.60	0.05		W151166	AS	12/20/11 16:03	
EPA 6010B	Copper	28.8	mg/kg	1.00	0.21		W151166	AS	12/20/11 16:03	
EPA 6010B	Iron	38000	mg/kg	6.0	1.1		W151166	AS	12/20/11 16:02	
EPA 6010B	Manganese	74.0	mg/kg	0.40	0.04		W151166	AS	12/20/11 16:02	
EPA 6010B	Nickel	12.5	mg/kg	1.00	0.22		W151166	AS	12/20/11 16:03	
EPA 6010B	Vanadium	29.9	mg/kg	0.50	0.04		W151166	AS	12/20/11 16:03	
EPA 6010B	Zinc	18.7	mg/kg	1.00	0.09		W151166	AS	12/20/11 16:03	
EPA 7471A	Mercury	0.053	mg/kg	0.033	0.007		W151146	DJA	12/16/11 15:02	H1

Classical Chemistry Parameters

SM 4500-CN-I	Cyanide (WAD)	< 0.500	mg/kg	0.500	0.065		W151143	CFE	12/20/11 12:52	H3
SW846 9012B	Cyanide (total)	< 0.50	mg/kg	0.50	0.10		W151140	CFE	12/19/11 16:18	H3
SW-846 9213	Cyanide (free)	< 1.00	mg/kg	1.00	0.09		W151144	IIT/C	12/29/11 15:15	H3
USDA HB60(24)	Total Organic Carbon	0.246	%	0.0900	0.0180		W151180	SM	12/20/11 14:52	
USDA HB60(24)	Total Organic Matter	0.425	%	0.150	0.0310		W151180	SM	12/20/11 14:52	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Kirby Gray
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Kellogg ID 83837-0929

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Golder Associates (WA)
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Project Name: **Suriname - Merian Gold 2011 / 113-93245**

Work Order: **W1L0027**

Reported: 30-Dec-11 10:53

Client Sample ID: **11202011SW006**

SVL Sample ID: **W1L0027-05 (Soil)**

Sampled: 20-Nov-11 11:15

Received: 01-Dec-11

Sampled By: DH/JE

Sample Report Page 1 of 1

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total)										
EPA 6020	Arsenic	< 0.300	mg/kg	0.300	0.060	5	W151126	KWH	12/21/11 11:30	
EPA 6020	Cadmium	< 0.100	mg/kg	0.100	0.018	5	W151126	KWH	12/21/11 11:30	
EPA 6020	Lead	1.93	mg/kg	0.100	0.0125	5	W151126	KWH	12/21/11 11:30	
EPA 6020	Selenium	0.480	mg/kg	0.300	0.175	5	W151126	KWH	12/21/11 11:30	
EPA 6020	Silver	< 0.0500	mg/kg	0.0500	0.0085	5	W151126	KWH	12/21/11 11:30	
EPA 6020	Thallium	< 0.100	mg/kg	0.100	0.0033	5	W151126	KWH	12/21/11 11:30	

Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Aluminum	1940	mg/kg	8.0	1.6		W151166	AS	12/20/11 16:07	
EPA 6010B	Chromium	15.3	mg/kg	0.60	0.05		W151166	AS	12/20/11 16:09	
EPA 6010B	Copper	6.02	mg/kg	1.00	0.21		W151166	AS	12/20/11 16:09	
EPA 6010B	Iron	7330	mg/kg	6.0	1.1		W151166	AS	12/20/11 16:07	
EPA 6010B	Manganese	4.89	mg/kg	0.40	0.04		W151166	AS	12/20/11 16:07	
EPA 6010B	Nickel	1.72	mg/kg	1.00	0.22		W151166	AS	12/20/11 16:09	
EPA 6010B	Vanadium	16.7	mg/kg	0.50	0.04		W151166	AS	12/20/11 16:09	
EPA 6010B	Zinc	3.34	mg/kg	1.00	0.09		W151166	AS	12/20/11 16:09	
EPA 7471A	Mercury	0.067	mg/kg	0.033	0.007		W151146	DJA	12/16/11 15:04	

Classical Chemistry Parameters

SM 4500-CN-I	Cyanide (WAD)	< 0.500	mg/kg	0.500	0.065		W151143	CFE	12/20/11 12:54	H3
SW846 9012B	Cyanide (total)	< 0.50	mg/kg	0.50	0.10		W151140	CFE	12/19/11 16:20	H3
SW-846 9213	Cyanide (free)	< 1.00	mg/kg	1.00	0.09		W151144	IIT/C	12/29/11 15:15	H3
USDA HB60(24)	Total Organic Carbon	0.853	%	0.0900	0.0180		W151180	SM	12/20/11 14:52	
USDA HB60(24)	Total Organic Matter	1.47	%	0.150	0.0310		W151180	SM	12/20/11 14:52	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

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Project Name: **Suriname - Merian Gold 2011 / 113-93245**

Work Order: **W1L0027**

Reported: 30-Dec-11 10:53

Client Sample ID: **11202011SW007**

SVL Sample ID: **W1L0027-06 (Soil)**

Sampled: 20-Nov-11 13:15

Received: 01-Dec-11

Sampled By: DH/JE

Sample Report Page 1 of 1

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total)										
EPA 6020	Arsenic	< 0.300	mg/kg	0.300	0.060	5	W151126	KWH	12/21/11 11:35	
EPA 6020	Cadmium	< 0.100	mg/kg	0.100	0.018	5	W151126	KWH	12/21/11 11:35	
EPA 6020	Lead	2.94	mg/kg	0.100	0.0125	5	W151126	KWH	12/21/11 11:35	
EPA 6020	Selenium	< 0.300	mg/kg	0.300	0.175	5	W151126	KWH	12/21/11 11:35	
EPA 6020	Silver	< 0.0500	mg/kg	0.0500	0.0085	5	W151126	KWH	12/21/11 11:35	
EPA 6020	Thallium	< 0.100	mg/kg	0.100	0.0033	5	W151126	KWH	12/21/11 11:35	

Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Aluminum	2060	mg/kg	8.0	1.6		W151166	AS	12/20/11 16:13	
EPA 6010B	Chromium	22.9	mg/kg	0.60	0.05		W151166	AS	12/20/11 16:14	
EPA 6010B	Copper	15.0	mg/kg	1.00	0.21		W151166	AS	12/20/11 16:14	
EPA 6010B	Iron	17600	mg/kg	6.0	1.1		W151166	AS	12/20/11 16:12	
EPA 6010B	Manganese	35.8	mg/kg	0.40	0.04		W151166	AS	12/20/11 16:13	
EPA 6010B	Nickel	2.61	mg/kg	1.00	0.22		W151166	AS	12/20/11 16:14	
EPA 6010B	Vanadium	20.7	mg/kg	0.50	0.04		W151166	AS	12/20/11 16:14	
EPA 6010B	Zinc	7.38	mg/kg	1.00	0.09		W151166	AS	12/20/11 16:14	
EPA 7471A	Mercury	0.380	mg/kg	0.033	0.007		W151146	DJA	12/16/11 15:09	

Classical Chemistry Parameters

SM 4500-CN-I	Cyanide (WAD)	< 0.500	mg/kg	0.500	0.065		W151143	CFE	12/20/11 12:56	H3
SW846 9012B	Cyanide (total)	< 0.50	mg/kg	0.50	0.10		W151140	CFE	12/19/11 16:22	H3
SW-846 9213	Cyanide (free)	< 1.00	mg/kg	1.00	0.09		W151144	IIT/C	12/29/11 15:15	H3
USDA HB60(24)	Total Organic Carbon	0.185	%	0.0900	0.0180		W151180	SM	12/20/11 14:52	
USDA HB60(24)	Total Organic Matter	0.319	%	0.150	0.0310		W151180	SM	12/20/11 14:52	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Kirby Gray
Technical Director



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Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0027**

Reported: 30-Dec-11 10:53

Client Sample ID: **11202011SW008**

SVL Sample ID: **W1L0027-07 (Soil)**

Sampled: 20-Nov-11 14:40

Received: 01-Dec-11

Sampled By: DH/JE

Sample Report Page 1 of 1

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total)										
EPA 6020	Arsenic	< 0.300	mg/kg	0.300	0.060	5	W151126	KWH	12/21/11 11:41	
EPA 6020	Cadmium	< 0.100	mg/kg	0.100	0.018	5	W151126	KWH	12/21/11 11:41	
EPA 6020	Lead	2.95	mg/kg	0.100	0.0125	5	W151126	KWH	12/21/11 11:41	
EPA 6020	Selenium	< 0.300	mg/kg	0.300	0.175	5	W151126	KWH	12/21/11 11:41	
EPA 6020	Silver	< 0.0500	mg/kg	0.0500	0.0085	5	W151126	KWH	12/21/11 11:41	
EPA 6020	Thallium	< 0.100	mg/kg	0.100	0.0033	5	W151126	KWH	12/21/11 11:41	

Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Aluminum	1920	mg/kg	8.0	1.6		W151166	AS	12/20/11 16:28	
EPA 6010B	Chromium	21.0	mg/kg	0.60	0.05		W151166	AS	12/20/11 16:29	
EPA 6010B	Copper	14.4	mg/kg	1.00	0.21		W151166	AS	12/20/11 16:29	
EPA 6010B	Iron	16000	mg/kg	6.0	1.1		W151166	AS	12/20/11 16:28	
EPA 6010B	Manganese	31.7	mg/kg	0.40	0.04		W151166	AS	12/20/11 16:28	
EPA 6010B	Nickel	2.26	mg/kg	1.00	0.22		W151166	AS	12/20/11 16:29	
EPA 6010B	Vanadium	19.4	mg/kg	0.50	0.04		W151166	AS	12/20/11 16:29	
EPA 6010B	Zinc	6.70	mg/kg	1.00	0.09		W151166	AS	12/20/11 16:29	
EPA 7471A	Mercury	0.320	mg/kg	0.033	0.007		W151146	DJA	12/16/11 15:10	

Classical Chemistry Parameters

SM 4500-CN-I	Cyanide (WAD)	< 0.500	mg/kg	0.500	0.065		W151143	CFE	12/20/11 12:58	H3
SW846 9012B	Cyanide (total)	< 0.50	mg/kg	0.50	0.10		W151140	CFE	12/19/11 16:24	H3
SW-846 9213	Cyanide (free)	< 1.00	mg/kg	1.00	0.09		W151144	IIT/C	12/29/11 15:15	H3
USDA HB60(24)	Total Organic Carbon	0.124	%	0.0900	0.0180		W151180	SM	12/20/11 14:52	
USDA HB60(24)	Total Organic Matter	0.214	%	0.150	0.0310		W151180	SM	12/20/11 14:52	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Kirby Gray
Technical Director



Golder Associates (WA)
 18300 NE Union Hill Road, Suite 200
 Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245
 Work Order: **W1L0027**
 Reported: 30-Dec-11 10:53

Quality Control - BLANK Data

Method	Analyte	Units	Result	MDL	MRL	Batch ID	Analyzed	Notes
Metals (Total)								
EPA 6020	Arsenic	mg/kg	<0.300	0.060	0.300	W151126	21-Dec-11	
EPA 6020	Cadmium	mg/kg	<0.100	0.018	0.100	W151126	21-Dec-11	
EPA 6020	Lead	mg/kg	<0.100	0.0125	0.100	W151126	21-Dec-11	
EPA 6020	Selenium	mg/kg	<0.300	0.175	0.300	W151126	21-Dec-11	
EPA 6020	Silver	mg/kg	<0.0500	0.0085	0.0500	W151126	21-Dec-11	
EPA 6020	Thallium	mg/kg	<0.100	0.0033	0.100	W151126	21-Dec-11	

Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Aluminum	mg/kg	<8.0	1.6	8.0	W151166	20-Dec-11	
EPA 6010B	Chromium	mg/kg	<0.60	0.05	0.60	W151166	20-Dec-11	
EPA 6010B	Copper	mg/kg	<1.00	0.21	1.00	W151166	20-Dec-11	
EPA 6010B	Iron	mg/kg	<6.0	1.1	6.0	W151166	20-Dec-11	
EPA 6010B	Manganese	mg/kg	<0.40	0.04	0.40	W151166	20-Dec-11	
EPA 6010B	Nickel	mg/kg	<1.00	0.22	1.00	W151166	20-Dec-11	
EPA 6010B	Vanadium	mg/kg	<0.50	0.04	0.50	W151166	20-Dec-11	
EPA 6010B	Zinc	mg/kg	<1.00	0.09	1.00	W151166	20-Dec-11	
EPA 7471A	Mercury	mg/kg	<0.033	0.007	0.033	W151146	16-Dec-11	

Classical Chemistry Parameters

SM 4500-CN-I	Cyanide (WAD)	mg/kg	<0.500	0.065	0.500	W151143	20-Dec-11	
SW846 9012B	Cyanide (total)	mg/kg	<0.50	0.10	0.50	W151140	19-Dec-11	
SW-846 9213	Cyanide (free)	mg/kg	<1.00	0.09	1.00	W151144	29-Dec-11	
USDA HB60(24)	Total Organic Matter	%	<0.150	0.0310	0.150	W151180	20-Dec-11	
USDA HB60(24)	Total Organic Carbon	%	<0.0900	0.0180	0.0900	W151180	20-Dec-11	

Quality Control - LABORATORY CONTROL SAMPLE Data

Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
Metals (Total)									
EPA 6020	Arsenic	mg/kg	2.71	2.50	108	80 - 120	W151126	21-Dec-11	
EPA 6020	Cadmium	mg/kg	2.69	2.50	108	80 - 120	W151126	21-Dec-11	
EPA 6020	Lead	mg/kg	2.47	2.50	98.9	80 - 120	W151126	21-Dec-11	
EPA 6020	Selenium	mg/kg	2.88	2.50	115	80 - 120	W151126	21-Dec-11	
EPA 6020	Silver	mg/kg	2.56	2.50	102	80 - 120	W151126	21-Dec-11	
EPA 6020	Thallium	mg/kg	2.53	2.50	101	80 - 120	W151126	21-Dec-11	

Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Aluminum	mg/kg	94.2	100	94.2	80 - 120	W151166	20-Dec-11	
EPA 6010B	Chromium	mg/kg	93.6	100	93.6	80 - 120	W151166	20-Dec-11	
EPA 6010B	Copper	mg/kg	95.9	100	95.9	80 - 120	W151166	20-Dec-11	
EPA 6010B	Iron	mg/kg	930	1000	93.0	80 - 120	W151166	20-Dec-11	
EPA 6010B	Manganese	mg/kg	92.7	100	92.7	80 - 120	W151166	20-Dec-11	
EPA 6010B	Nickel	mg/kg	88.7	100	88.7	80 - 120	W151166	20-Dec-11	
EPA 6010B	Vanadium	mg/kg	95.0	100	95.0	80 - 120	W151166	20-Dec-11	
EPA 6010B	Zinc	mg/kg	88.5	100	88.5	80 - 120	W151166	20-Dec-11	
EPA 7471A	Mercury	mg/kg	0.858	0.833	103	80 - 120	W151146	16-Dec-11	

Classical Chemistry Parameters

SM 4500-CN-I	Cyanide (WAD)	mg/kg	1.58	1.50	105	80 - 120	W151143	20-Dec-11	
SW846 9012B	Cyanide (total)	mg/kg	8.70	9.60	90.6	80 - 120	W151140	19-Dec-11	
SW-846 9213	Cyanide (free)	mg/kg	10.4	10.0	104	85 - 115	W151144	29-Dec-11	
USDA HB60(24)	Total Organic Matter	%	0.500	0.464	108	80 - 120	W151180	20-Dec-11	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



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Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0027**

Reported: 30-Dec-11 10:53

Quality Control - LABORATORY CONTROL SAMPLE Data (Continued)

Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
Classical Chemistry Parameters (Continued)									
USDA HB60(24)	Total Organic Carbon	%	0.290	0.269	108	80 - 120	W151180	20-Dec-11	

Quality Control - DUPLICATE Data

Method	Analyte	Units	Duplicate Result	Sample Result	RPD	RPD Limit	Batch ID	Analyzed	Notes
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Metals (Total)

EPA 6020	Arsenic	mg/kg	0.713	0.760	6.5	20	W151126	21-Dec-11	
EPA 6020	Cadmium	mg/kg	<0.100	<0.100	UDL	20	W151126	21-Dec-11	
EPA 6020	Lead	mg/kg	1.57	1.73	9.9	20	W151126	21-Dec-11	
EPA 6020	Selenium	mg/kg	0.558	0.469	17.4	20	W151126	21-Dec-11	
EPA 6020	Silver	mg/kg	<0.0500	<0.0500	UDL	20	W151126	21-Dec-11	
EPA 6020	Thallium	mg/kg	<0.100	<0.100	<RL	20	W151126	21-Dec-11	

Classical Chemistry Parameters

SM 4500-CN-1	Cyanide (WAD)	mg/kg	<0.500	<0.500	UDL	20	W151143	20-Dec-11	
SW846 9012B	Cyanide (total)	mg/kg	<0.50	<0.50	UDL	20	W151140	19-Dec-11	
SW-846 9213	Cyanide (free)	mg/kg	1.89	2.19	14.7	20	W151144	29-Dec-11	
USDA HB60(24)	Total Organic Matter	%	0.888	0.829	6.8	20	W151180	20-Dec-11	
USDA HB60(24)	Total Organic Carbon	%	0.515	0.481	6.8	20	W151180	20-Dec-11	

Quality Control - MATRIX SPIKE Data

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Total)

EPA 6020	Arsenic	mg/kg	2.74	0.760	2.50	79.2	75 - 125	W151126	21-Dec-11	
EPA 6020	Cadmium	mg/kg	2.65	<0.100	2.50	106	75 - 125	W151126	21-Dec-11	
EPA 6020	Lead	mg/kg	4.11	1.73	2.50	95.1	75 - 125	W151126	21-Dec-11	
EPA 6020	Selenium	mg/kg	2.86	0.469	2.50	95.6	75 - 125	W151126	21-Dec-11	
EPA 6020	Silver	mg/kg	2.55	<0.0500	2.50	102	75 - 125	W151126	21-Dec-11	
EPA 6020	Thallium	mg/kg	2.47	<0.100	2.50	98.0	75 - 125	W151126	21-Dec-11	

Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Aluminum	mg/kg	7050	1970	100	R > 4S	75 - 125	W151166	20-Dec-11	M3
EPA 6010B	Chromium	mg/kg	105	8.44	100	96.4	75 - 125	W151166	20-Dec-11	
EPA 6010B	Copper	mg/kg	96.9	2.01	100	94.9	75 - 125	W151166	20-Dec-11	
EPA 6010B	Iron	mg/kg	6600	6050	1000	R > 4S	75 - 125	W151166	20-Dec-11	M3
EPA 6010B	Manganese	mg/kg	109	17.9	100	91.2	75 - 125	W151166	20-Dec-11	
EPA 6010B	Nickel	mg/kg	91.0	1.05	100	89.9	75 - 125	W151166	20-Dec-11	
EPA 6010B	Vanadium	mg/kg	102	7.99	100	94.3	75 - 125	W151166	20-Dec-11	
EPA 6010B	Zinc	mg/kg	91.4	2.40	100	89.0	75 - 125	W151166	20-Dec-11	
EPA 7471A	Mercury	mg/kg	0.375	0.185	0.167	114	75 - 125	W151146	16-Dec-11	

Classical Chemistry Parameters

SM 4500-CN-1	Cyanide (WAD)	mg/kg	0.970	<0.500	1.00	97.0	75 - 125	W151143	20-Dec-11	
SM 4500-CN-1	Cyanide (WAD)	mg/kg	1.03	<0.500	1.00	103	75 - 125	W151143	20-Dec-11	
SW846 9012B	Cyanide (total)	mg/kg	12.0	10.3	1.00	R > 4S	90 - 110	W151140	19-Dec-11	D2,M3
SW846 9012B	Cyanide (total)	mg/kg	1.07	<0.50	1.00	107	90 - 110	W151140	19-Dec-11	
SW-846 9213	Cyanide (free)	mg/kg	11.4	<1.00	10.0	105	85 - 115	W151144	29-Dec-11	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0027**

Reported: 30-Dec-11 10:53

Quality Control - MATRIX SPIKE Data (Continued)

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Classical Chemistry Parameters (Continued)

SW-846 9213	Cyanide (free)	mg/kg	12.9	2.19	10.0	107	85 - 115	W151144	29-Dec-11	
USDA HB60(24)	Total Organic Matter	%	4.03	0.829	2.92	110	75 - 125	W151180	20-Dec-11	
USDA HB60(24)	Total Organic Carbon	%	2.34	0.481	1.69	110	75 - 125	W151180	20-Dec-11	

Quality Control - MATRIX SPIKE DUPLICATE Data

Method	Analyte	Units	MSD Result	Spike Result	Spike Level	RPD	RPD Limit	Batch ID	Analyzed	Notes
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Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Aluminum	mg/kg	6990	7050	100	0.8	20	W151166	20-Dec-11	
EPA 6010B	Chromium	mg/kg	108	105	100	3.1	20	W151166	20-Dec-11	
EPA 6010B	Copper	mg/kg	99.0	96.9	100	2.1	20	W151166	20-Dec-11	
EPA 6010B	Iron	mg/kg	7250	6600	1000	9.4	20	W151166	20-Dec-11	
EPA 6010B	Manganese	mg/kg	113	109	100	3.3	20	W151166	20-Dec-11	
EPA 6010B	Nickel	mg/kg	93.8	91.0	100	3.0	20	W151166	20-Dec-11	
EPA 6010B	Vanadium	mg/kg	105	102	100	3.0	20	W151166	20-Dec-11	
EPA 6010B	Zinc	mg/kg	94.1	91.4	100	3.0	20	W151166	20-Dec-11	
EPA 7471A	Mercury	mg/kg	0.347	0.375	0.167	7.9	20	W151146	16-Dec-11	

Classical Chemistry Parameters

SW846 9012B	Cyanide (total)	mg/kg	1.09	1.07	1.00	1.9	20	W151140	19-Dec-11	
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Quality Control - POST DIGESTION SPIKE Data

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Total)

EPA 6020	Arsenic	mg/kg	3.59	0.760	2.50	113	75 - 125	W151126	21-Dec-11	
EPA 6020	Cadmium	mg/kg	2.74	<0.100	2.50	109	75 - 125	W151126	21-Dec-11	
EPA 6020	Lead	mg/kg	4.22	1.73	2.50	99.4	75 - 125	W151126	21-Dec-11	
EPA 6020	Selenium	mg/kg	3.53	0.469	2.50	122	75 - 125	W151126	21-Dec-11	
EPA 6020	Silver	mg/kg	2.62	<0.0500	2.50	105	75 - 125	W151126	21-Dec-11	
EPA 6020	Thallium	mg/kg	2.57	<0.1000	2.50	102	75 - 125	W151126	21-Dec-11	



Golder Associates (WA)
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Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0027**

Reported: 30-Dec-11 10:53

Notes and Definitions

D2	Sample required dilution due to high concentration of target analyte.
H1	Sample analysis performed past holding time.
H3	Sample was received and analyzed past holding time.
M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to spike level. The LCS was acceptable.
LCS	Laboratory Control Sample (Blank Spike)
RPD	Relative Percent Difference
UDL	A result is less than the detection limit
R > 4S	% recovery not applicable, sample concentration more than four times greater than spike level
<RL	A result is less than the reporting limit
MRL	Method Reporting Limit
MDL	Method Detection Limit
N/A	Not Applicable



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0443**

Reported: 05-Jan-12 16:24

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Sampled By	Date Received
11162011SD001	W1L0443-01	Soil	16-Nov-11 10:30	DH/JE	01-Dec-2011
11162011SW002	W1L0443-02	Soil	16-Nov-11 11:00	DH/JE	01-Dec-2011
11162011SW003	W1L0443-03	Soil	16-Nov-11 12:00	DH/JE	01-Dec-2011
11162011SW004	W1L0443-04	Soil	16-Nov-11 12:00	DH/JE	01-Dec-2011
11202011SW006	W1L0443-05	Soil	20-Nov-11 11:15	DH/JE	01-Dec-2011
11202011SW007	W1L0443-06	Soil	20-Nov-11 13:15	DH/JE	01-Dec-2011
11202011SW008	W1L0443-07	Soil	20-Nov-11 14:40	DH/JE	01-Dec-2011

Solid samples are analyzed on an as-received, wet-weight basis, unless otherwise requested. Non-Detects are reported at the MDL.

Sample preparation is defined by the client as per their Data Quality Objectives.

This report supercedes any previous reports for this Work Order. The complete report includes pages for each sample, a full QC report, and a notes section.

The results presented in this report relate only to the samples, and meet all requirements of the NELAC Standards unless otherwise noted.

Case Narrative

The sediment samples on this work order have been sieved with a #230 mesh sieve.



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: **Suriname - Merian Gold 2011 / 113-93245**

Work Order: **W1L0443**

Reported: 05-Jan-12 16:24

Client Sample ID: **11162011SD001**

SVL Sample ID: **W1L0443-01 (Soil)**

Sample Report Page 1 of 1

Sampled: 16-Nov-11 10:30

Received: 01-Dec-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total)										
EPA 6020	Arsenic	1.04	mg/kg	0.300	0.060	5	W153005	KWH	01/05/12 08:11	D1
EPA 6020	Cadmium	< 0.100	mg/kg	0.100	0.018	5	W153005	KWH	01/05/12 08:11	D1
EPA 6020	Lead	5.31	mg/kg	0.100	0.0125	5	W153005	KWH	01/05/12 08:11	D1
EPA 6020	Selenium	0.857	mg/kg	0.300	0.175	5	W153005	KWH	01/05/12 08:11	D1
EPA 6020	Silver	< 0.0500	mg/kg	0.0500	0.0085	5	W153005	KWH	01/05/12 08:11	D1
EPA 6020	Thallium	< 0.100	mg/kg	0.100	0.0033	5	W153005	KWH	01/05/12 08:11	D1

Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Aluminum	4370	mg/kg	8.0	1.6		W153064	DT	01/04/12 09:30	
EPA 6010B	Chromium	18.7	mg/kg	0.60	0.05		W153064	DT	01/04/12 09:31	
EPA 6010B	Copper	5.04	mg/kg	1.00	0.21		W153064	DT	01/04/12 09:31	
EPA 6010B	Iron	12600	mg/kg	6.0	1.1		W153064	DT	01/04/12 09:30	
EPA 6010B	Manganese	36.4	mg/kg	0.40	0.04		W153064	DT	01/04/12 09:30	
EPA 6010B	Nickel	2.23	mg/kg	1.00	0.22		W153064	DT	01/04/12 09:31	
EPA 6010B	Vanadium	16.9	mg/kg	0.50	0.04		W153064	DT	01/04/12 09:31	
EPA 6010B	Zinc	9.36	mg/kg	1.00	0.09		W153064	DT	01/04/12 09:32	
EPA 7471A	Mercury	0.140	mg/kg	0.033	0.007		W153049	DJA	12/28/11 12:33	H3

Classical Chemistry Parameters

SM 4500-CN-I	Cyanide (WAD)	< 0.500	mg/kg	0.500	0.065		W153036	CFE	12/28/11 14:34	H3
SW846 9012B	Cyanide (total)	< 0.50	mg/kg	0.50	0.10		W153035	CFE	12/28/11 12:52	H3
SW-846 9213	Cyanide (free)	< 1.00	mg/kg	1.00	0.09		W153078	CFE	12/30/11 08:30	H3
USDA HB60(24)	Total Organic Carbon	0.639	%	0.0900	0.0180		W201046	SM	01/05/12 10:20	
USDA HB60(24)	Total Organic Matter	1.10	%	0.150	0.0310		W201046	SM	01/05/12 10:20	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Kirby Gray
Technical Director



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Golder Associates (WA)
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Project Name: **Suriname - Merian Gold 2011 / 113-93245**

Work Order: **W1L0443**

Reported: 05-Jan-12 16:24

Client Sample ID: **11162011SW002**

SVL Sample ID: **W1L0443-02 (Soil)**

Sampled: 16-Nov-11 11:00

Received: 01-Dec-11

Sampled By: DH/JE

Sample Report Page 1 of 1

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total)										
EPA 6020	Arsenic	2.05	mg/kg	0.300	0.060	5	W153005	KWH	01/05/12 08:38	D1
EPA 6020	Cadmium	< 0.100	mg/kg	0.100	0.018	5	W153005	KWH	01/05/12 08:38	D1
EPA 6020	Lead	3.18	mg/kg	0.100	0.0125	5	W153005	KWH	01/05/12 08:38	D1
EPA 6020	Selenium	0.877	mg/kg	0.300	0.175	5	W153005	KWH	01/05/12 08:38	D1
EPA 6020	Silver	< 0.0500	mg/kg	0.0500	0.0085	5	W153005	KWH	01/05/12 08:38	D1
EPA 6020	Thallium	< 0.100	mg/kg	0.100	0.0033	5	W153005	KWH	01/05/12 08:38	D1

Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Aluminum	3610	mg/kg	8.0	1.6		W153064	DT	01/04/12 09:45	
EPA 6010B	Chromium	21.2	mg/kg	0.60	0.05		W153064	DT	01/04/12 09:46	
EPA 6010B	Copper	7.60	mg/kg	1.00	0.21		W153064	DT	01/04/12 09:46	
EPA 6010B	Iron	15500	mg/kg	6.0	1.1		W153064	DT	01/04/12 09:45	
EPA 6010B	Manganese	165	mg/kg	0.40	0.04		W153064	DT	01/04/12 09:45	
EPA 6010B	Nickel	6.81	mg/kg	1.00	0.22		W153064	DT	01/04/12 09:46	
EPA 6010B	Vanadium	13.7	mg/kg	0.50	0.04		W153064	DT	01/04/12 09:46	
EPA 6010B	Zinc	13.6	mg/kg	1.00	0.09		W153064	DT	01/04/12 09:46	
EPA 7471A	Mercury	0.165	mg/kg	0.033	0.007		W153049	DJA	12/28/11 12:38	H3

Classical Chemistry Parameters

SM 4500-CN-I	Cyanide (WAD)	< 0.500	mg/kg	0.500	0.065		W153036	CFE	12/28/11 14:36	H3
SW846 9012B	Cyanide (total)	< 0.50	mg/kg	0.50	0.10		W153035	CFE	12/28/11 12:54	H3
SW-846 9213	Cyanide (free)	< 1.00	mg/kg	1.00	0.09		W153078	CFE	12/30/11 08:30	H3
USDA HB60(24)	Total Organic Carbon	1.99	%	0.0900	0.0180		W201046	SM	01/05/12 10:20	
USDA HB60(24)	Total Organic Matter	3.43	%	0.150	0.0310		W201046	SM	01/05/12 10:20	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Kirby Gray
Technical Director



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Golder Associates (WA)
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Project Name: **Suriname - Merian Gold 2011 / 113-93245**

Work Order: **W1L0443**

Reported: 05-Jan-12 16:24

Client Sample ID: **11162011SW003**

SVL Sample ID: **W1L0443-03 (Soil)**

Sampled: 16-Nov-11 12:00

Received: 01-Dec-11

Sampled By: DH/JE

Sample Report Page 1 of 1

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total)										
EPA 6020	Arsenic	1.02	mg/kg	0.300	0.060	5	W153005	KWH	01/05/12 08:44	D1
EPA 6020	Cadmium	< 0.100	mg/kg	0.100	0.018	5	W153005	KWH	01/05/12 08:44	D1
EPA 6020	Lead	4.44	mg/kg	0.100	0.0125	5	W153005	KWH	01/05/12 08:44	D1
EPA 6020	Selenium	0.649	mg/kg	0.300	0.175	5	W153005	KWH	01/05/12 08:44	D1
EPA 6020	Silver	< 0.0500	mg/kg	0.0500	0.0085	5	W153005	KWH	01/05/12 08:44	D1
EPA 6020	Thallium	< 0.100	mg/kg	0.100	0.0033	5	W153005	KWH	01/05/12 08:44	D1

Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Aluminum	5720	mg/kg	8.0	1.6		W153064	DT	01/04/12 09:50	
EPA 6010B	Chromium	34.8	mg/kg	0.60	0.05		W153064	DT	01/04/12 09:51	
EPA 6010B	Copper	9.77	mg/kg	1.00	0.21		W153064	DT	01/04/12 09:51	
EPA 6010B	Iron	18300	mg/kg	6.0	1.1		W153064	DT	01/04/12 09:50	
EPA 6010B	Manganese	23.2	mg/kg	0.40	0.04		W153064	DT	01/04/12 09:50	
EPA 6010B	Nickel	4.12	mg/kg	1.00	0.22		W153064	DT	01/04/12 09:51	
EPA 6010B	Vanadium	28.0	mg/kg	0.50	0.04		W153064	DT	01/04/12 09:51	
EPA 6010B	Zinc	11.8	mg/kg	1.00	0.09		W153064	DT	01/04/12 09:51	
EPA 7471A	Mercury	0.163	mg/kg	0.033	0.007		W153049	DJA	12/28/11 12:40	H3

Classical Chemistry Parameters

SM 4500-CN-I	Cyanide (WAD)	< 0.500	mg/kg	0.500	0.065		W153036	CFE	12/28/11 14:38	H3
SW846 9012B	Cyanide (total)	< 0.50	mg/kg	0.50	0.10		W153035	CFE	12/28/11 12:56	H3
SW-846 9213	Cyanide (free)	< 1.00	mg/kg	1.00	0.09		W153078	CFE	12/30/11 08:30	H3
USDA HB60(24)	Total Organic Carbon	0.977	%	0.0900	0.0180		W201046	SM	01/05/12 10:20	
USDA HB60(24)	Total Organic Matter	1.68	%	0.150	0.0310		W201046	SM	01/05/12 10:20	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

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Project Name: **Suriname - Merian Gold 2011 / 113-93245**

Work Order: **W1L0443**

Reported: 05-Jan-12 16:24

Client Sample ID: **11162011SW004**

SVL Sample ID: **W1L0443-04 (Soil)**

Sampled: 16-Nov-11 12:00

Received: 01-Dec-11

Sampled By: DH/JE

Sample Report Page 1 of 1

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total)										
EPA 6020	Arsenic	15.9	mg/kg	0.300	0.060	5	W153005	KWH	01/05/12 08:49	D1
EPA 6020	Cadmium	< 0.100	mg/kg	0.100	0.018	5	W153005	KWH	01/05/12 08:49	D1
EPA 6020	Lead	5.37	mg/kg	0.100	0.0125	5	W153005	KWH	01/05/12 08:49	D1
EPA 6020	Selenium	0.431	mg/kg	0.300	0.175	5	W153005	KWH	01/05/12 08:49	D1
EPA 6020	Silver	< 0.0500	mg/kg	0.0500	0.0085	5	W153005	KWH	01/05/12 08:49	D1
EPA 6020	Thallium	< 0.100	mg/kg	0.100	0.0033	5	W153005	KWH	01/05/12 08:49	D1

Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Aluminum	4520	mg/kg	8.0	1.6		W153064	DT	01/04/12 09:55	
EPA 6010B	Chromium	69.1	mg/kg	0.60	0.05		W153064	DT	01/04/12 09:56	
EPA 6010B	Copper	23.1	mg/kg	1.00	0.21		W153064	DT	01/04/12 09:56	
EPA 6010B	Iron	36200	mg/kg	6.0	1.1		W153064	DT	01/04/12 09:55	
EPA 6010B	Manganese	67.9	mg/kg	0.40	0.04		W153064	DT	01/04/12 09:55	
EPA 6010B	Nickel	11.0	mg/kg	1.00	0.22		W153064	DT	01/04/12 09:56	
EPA 6010B	Vanadium	28.7	mg/kg	0.50	0.04		W153064	DT	01/04/12 09:56	
EPA 6010B	Zinc	18.0	mg/kg	1.00	0.09		W153064	DT	01/04/12 09:56	
EPA 7471A	Mercury	0.382	mg/kg	0.033	0.007		W153049	DJA	12/28/11 12:42	H3

Classical Chemistry Parameters

SM 4500-CN-I	Cyanide (WAD)	< 0.500	mg/kg	0.500	0.065		W153036	CFE	12/28/11 14:40	H3
SW846 9012B	Cyanide (total)	< 0.50	mg/kg	0.50	0.10		W153035	CFE	12/28/11 12:58	H3
SW-846 9213	Cyanide (free)	< 1.00	mg/kg	1.00	0.09		W153078	CFE	12/30/11 08:30	H3
USDA HB60(24)	Total Organic Carbon	0.268	%	0.0900	0.0180		W201046	SM	01/05/12 10:20	
USDA HB60(24)	Total Organic Matter	0.463	%	0.150	0.0310		W201046	SM	01/05/12 10:20	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

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Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: **Suriname - Merian Gold 2011 / 113-93245**

Work Order: **W1L0443**

Reported: 05-Jan-12 16:24

Client Sample ID: **11202011SW006**

SVL Sample ID: **W1L0443-05 (Soil)**

Sampled: 20-Nov-11 11:15

Received: 01-Dec-11

Sampled By: DH/JE

Sample Report Page 1 of 1

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total)										
EPA 6020	Arsenic	< 0.300	mg/kg	0.300	0.060	5	W153005	KWH	01/05/12 09:06	D1
EPA 6020	Cadmium	< 0.100	mg/kg	0.100	0.018	5	W153005	KWH	01/05/12 09:06	D1
EPA 6020	Lead	3.82	mg/kg	0.100	0.0125	5	W153005	KWH	01/05/12 09:06	D1
EPA 6020	Selenium	0.679	mg/kg	0.300	0.175	5	W153005	KWH	01/05/12 09:06	D1
EPA 6020	Silver	< 0.0500	mg/kg	0.0500	0.0085	5	W153005	KWH	01/05/12 09:06	D1
EPA 6020	Thallium	< 0.100	mg/kg	0.100	0.0033	5	W153005	KWH	01/05/12 09:06	D1

Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Aluminum	4330	mg/kg	8.0	1.6		W153064	DT	01/04/12 10:00	
EPA 6010B	Chromium	31.7	mg/kg	0.60	0.05		W153064	DT	01/04/12 10:01	
EPA 6010B	Copper	11.4	mg/kg	1.00	0.21		W153064	DT	01/04/12 10:01	
EPA 6010B	Iron	14400	mg/kg	6.0	1.1		W153064	DT	01/04/12 10:00	
EPA 6010B	Manganese	9.34	mg/kg	0.40	0.04		W153064	DT	01/04/12 10:00	
EPA 6010B	Nickel	3.72	mg/kg	1.00	0.22		W153064	DT	01/04/12 10:01	
EPA 6010B	Vanadium	30.2	mg/kg	0.50	0.04		W153064	DT	01/04/12 10:01	
EPA 6010B	Zinc	7.11	mg/kg	1.00	0.09		W153064	DT	01/04/12 10:02	
EPA 7471A	Mercury	0.430	mg/kg	0.033	0.007		W153049	DJA	12/28/11 12:43	H3

Classical Chemistry Parameters

SM 4500-CN-I	Cyanide (WAD)	< 0.500	mg/kg	0.500	0.065		W153036	CFE	12/28/11 14:42	H3
SW846 9012B	Cyanide (total)	< 0.50	mg/kg	0.50	0.10		W153035	CFE	12/28/11 13:06	H3
SW-846 9213	Cyanide (free)	< 1.00	mg/kg	1.00	0.09		W153078	CFE	12/30/11 08:30	H3
USDA HB60(24)	Total Organic Carbon	1.15	%	0.0900	0.0180		W201046	SM	01/05/12 10:20	
USDA HB60(24)	Total Organic Matter	1.98	%	0.150	0.0310		W201046	SM	01/05/12 10:20	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Kirby Gray
Technical Director



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

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Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
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Project Name: **Suriname - Merian Gold 2011 / 113-93245**

Work Order: **W1L0443**

Reported: 05-Jan-12 16:24

Client Sample ID: **11202011SW007**

SVL Sample ID: **W1L0443-06 (Soil)**

Sample Report Page 1 of 1

Sampled: 20-Nov-11 13:15

Received: 01-Dec-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total)										
EPA 6020	Arsenic	< 0.300	mg/kg	0.300	0.060	5	W153005	KWH	01/05/12 09:11	D1
EPA 6020	Cadmium	< 0.100	mg/kg	0.100	0.018	5	W153005	KWH	01/05/12 09:11	D1
EPA 6020	Lead	3.95	mg/kg	0.100	0.0125	5	W153005	KWH	01/05/12 09:11	D1
EPA 6020	Selenium	< 0.300	mg/kg	0.300	0.175	5	W153005	KWH	01/05/12 09:11	D1
EPA 6020	Silver	< 0.0500	mg/kg	0.0500	0.0085	5	W153005	KWH	01/05/12 09:11	D1
EPA 6020	Thallium	< 0.100	mg/kg	0.100	0.0033	5	W153005	KWH	01/05/12 09:11	D1

Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Aluminum	3060	mg/kg	8.0	1.6		W153064	DT	01/04/12 10:05	
EPA 6010B	Chromium	32.9	mg/kg	0.60	0.05		W153064	DT	01/04/12 10:06	
EPA 6010B	Copper	20.8	mg/kg	1.00	0.21		W153064	DT	01/04/12 10:06	
EPA 6010B	Iron	24500	mg/kg	6.0	1.1		W153064	DT	01/04/12 10:05	
EPA 6010B	Manganese	47.1	mg/kg	0.40	0.04		W153064	DT	01/04/12 10:05	
EPA 6010B	Nickel	3.02	mg/kg	1.00	0.22		W153064	DT	01/04/12 10:06	
EPA 6010B	Vanadium	28.8	mg/kg	0.50	0.04		W153064	DT	01/04/12 10:06	
EPA 6010B	Zinc	10.1	mg/kg	1.00	0.09		W153064	DT	01/04/12 10:07	
EPA 7471A	Mercury	0.165	mg/kg	0.033	0.007		W153049	DJA	12/28/11 12:45	H3

Classical Chemistry Parameters

SM 4500-CN-I	Cyanide (WAD)	< 0.500	mg/kg	0.500	0.065		W153036	CFE	12/28/11 14:44	H3
SW846 9012B	Cyanide (total)	< 0.50	mg/kg	0.50	0.10		W153035	CFE	12/28/11 13:08	H3
SW-846 9213	Cyanide (free)	< 1.00	mg/kg	1.00	0.09		W153078	CFE	12/30/11 08:30	H3
USDA HB60(24)	Total Organic Carbon	0.127	%	0.0900	0.0180		W201046	SM	01/05/12 10:20	
USDA HB60(24)	Total Organic Matter	0.219	%	0.150	0.0310		W201046	SM	01/05/12 10:20	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Kirby Gray
Technical Director



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Project Name: **Suriname - Merian Gold 2011 / 113-93245**

Work Order: **W1L0443**

Reported: 05-Jan-12 16:24

Client Sample ID: **11202011SW008**

SVL Sample ID: **W1L0443-07 (Soil)**

Sampled: 20-Nov-11 14:40

Received: 01-Dec-11

Sampled By: DH/JE

Sample Report Page 1 of 1

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total)										
EPA 6020	Arsenic	< 0.300	mg/kg	0.300	0.060	5	W153005	KWH	01/05/12 09:16	D1
EPA 6020	Cadmium	< 0.100	mg/kg	0.100	0.018	5	W153005	KWH	01/05/12 09:16	D1
EPA 6020	Lead	4.61	mg/kg	0.100	0.0125	5	W153005	KWH	01/05/12 09:16	D1
EPA 6020	Selenium	< 0.300	mg/kg	0.300	0.175	5	W153005	KWH	01/05/12 09:16	D1
EPA 6020	Silver	< 0.0500	mg/kg	0.0500	0.0085	5	W153005	KWH	01/05/12 09:16	D1
EPA 6020	Thallium	< 0.100	mg/kg	0.100	0.0033	5	W153005	KWH	01/05/12 09:16	D1

Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Aluminum	3050	mg/kg	8.0	1.6		W153064	DT	01/04/12 10:21	
EPA 6010B	Chromium	34.5	mg/kg	0.60	0.05		W153064	DT	01/04/12 10:22	
EPA 6010B	Copper	21.5	mg/kg	1.00	0.21		W153064	DT	01/04/12 10:22	
EPA 6010B	Iron	25500	mg/kg	6.0	1.1		W153064	DT	01/04/12 10:21	
EPA 6010B	Manganese	47.8	mg/kg	0.40	0.04		W153064	DT	01/04/12 10:21	
EPA 6010B	Nickel	2.62	mg/kg	1.00	0.22		W153064	DT	01/04/12 10:22	
EPA 6010B	Vanadium	31.0	mg/kg	0.50	0.04		W153064	DT	01/04/12 10:22	
EPA 6010B	Zinc	10.2	mg/kg	1.00	0.09		W153064	DT	01/04/12 10:22	
EPA 7471A	Mercury	0.172	mg/kg	0.033	0.007		W153049	DJA	12/28/11 12:50	H3

Classical Chemistry Parameters

SM 4500-CN-I	Cyanide (WAD)	< 0.500	mg/kg	0.500	0.065		W153036	CFE	12/28/11 14:46	H3
SW846 9012B	Cyanide (total)	< 0.50	mg/kg	0.50	0.10		W153035	CFE	12/28/11 13:10	H3
SW-846 9213	Cyanide (free)	< 1.00	mg/kg	1.00	0.09		W153078	CFE	12/30/11 08:30	H3
USDA HB60(24)	Total Organic Carbon	0.158	%	0.0900	0.0180		W201046	SM	01/05/12 10:20	
USDA HB60(24)	Total Organic Matter	0.272	%	0.150	0.0310		W201046	SM	01/05/12 10:20	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Kirby Gray
Technical Director



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Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0443**

Reported: 05-Jan-12 16:24

Quality Control - BLANK Data

Method	Analyte	Units	Result	MDL	MRL	Batch ID	Analyzed	Notes
Metals (Total)								
EPA 6020	Arsenic	mg/kg	<0.300	0.060	0.300	W153005	05-Jan-12	D1
EPA 6020	Cadmium	mg/kg	<0.100	0.018	0.100	W153005	05-Jan-12	D1
EPA 6020	Lead	mg/kg	<0.100	0.0125	0.100	W153005	05-Jan-12	D1
EPA 6020	Selenium	mg/kg	<0.300	0.175	0.300	W153005	05-Jan-12	D1
EPA 6020	Silver	mg/kg	<0.0500	0.0085	0.0500	W153005	05-Jan-12	D1
EPA 6020	Thallium	mg/kg	<0.100	0.0033	0.100	W153005	05-Jan-12	D1

Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Aluminum	mg/kg	<8.0	1.6	8.0	W153064	04-Jan-12	
EPA 6010B	Chromium	mg/kg	<0.60	0.05	0.60	W153064	04-Jan-12	
EPA 6010B	Copper	mg/kg	<1.00	0.21	1.00	W153064	04-Jan-12	
EPA 6010B	Iron	mg/kg	<6.0	1.1	6.0	W153064	04-Jan-12	
EPA 6010B	Manganese	mg/kg	<0.40	0.04	0.40	W153064	04-Jan-12	
EPA 6010B	Nickel	mg/kg	<1.00	0.22	1.00	W153064	04-Jan-12	
EPA 6010B	Vanadium	mg/kg	<0.50	0.04	0.50	W153064	04-Jan-12	
EPA 6010B	Zinc	mg/kg	<1.00	0.09	1.00	W153064	04-Jan-12	
EPA 7471A	Mercury	mg/kg	<0.033	0.007	0.033	W153049	28-Dec-11	

Classical Chemistry Parameters

SM 4500-CN-I	Cyanide (WAD)	mg/kg	<0.500	0.065	0.500	W153036	28-Dec-11	
SW846 9012B	Cyanide (total)	mg/kg	<0.50	0.10	0.50	W153035	28-Dec-11	
SW-846 9213	Cyanide (free)	mg/kg	<1.00	0.09	1.00	W153078	30-Dec-11	
USDA HB60(24)	Total Organic Matter	%	<0.150	0.0310	0.150	W201046	05-Jan-12	
USDA HB60(24)	Total Organic Carbon	%	<0.0900	0.0180	0.0900	W201046	05-Jan-12	

Quality Control - LABORATORY CONTROL SAMPLE Data

Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
Metals (Total)									
EPA 6020	Arsenic	mg/kg	2.63	2.50	105	80 - 120	W153005	05-Jan-12	D1
EPA 6020	Cadmium	mg/kg	2.63	2.50	105	80 - 120	W153005	05-Jan-12	D1
EPA 6020	Lead	mg/kg	2.46	2.50	98.5	80 - 120	W153005	05-Jan-12	D1
EPA 6020	Selenium	mg/kg	2.73	2.50	109	80 - 120	W153005	05-Jan-12	D1
EPA 6020	Silver	mg/kg	2.58	2.50	103	80 - 120	W153005	05-Jan-12	D1
EPA 6020	Thallium	mg/kg	2.45	2.50	98.0	80 - 120	W153005	05-Jan-12	D1

Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Aluminum	mg/kg	95.8	100	95.8	80 - 120	W153064	04-Jan-12	
EPA 6010B	Chromium	mg/kg	91.7	100	91.7	80 - 120	W153064	04-Jan-12	
EPA 6010B	Copper	mg/kg	86.7	100	86.7	80 - 120	W153064	04-Jan-12	
EPA 6010B	Iron	mg/kg	994	1000	99.4	80 - 120	W153064	04-Jan-12	
EPA 6010B	Manganese	mg/kg	92.2	100	92.2	80 - 120	W153064	04-Jan-12	
EPA 6010B	Nickel	mg/kg	86.6	100	86.6	80 - 120	W153064	04-Jan-12	
EPA 6010B	Vanadium	mg/kg	93.2	100	93.2	80 - 120	W153064	04-Jan-12	
EPA 6010B	Zinc	mg/kg	86.5	100	86.5	80 - 120	W153064	04-Jan-12	
EPA 7471A	Mercury	mg/kg	0.830	0.833	99.6	80 - 120	W153049	28-Dec-11	

Classical Chemistry Parameters

SM 4500-CN-I	Cyanide (WAD)	mg/kg	1.55	1.50	103	80 - 120	W153036	28-Dec-11	
SW846 9012B	Cyanide (total)	mg/kg	9.60	9.60	100	80 - 120	W153035	28-Dec-11	
SW-846 9213	Cyanide (free)	mg/kg	10.4	10.0	104	85 - 115	W153078	30-Dec-11	
USDA HB60(24)	Total Organic Matter	%	0.518	0.464	112	80 - 120	W201046	05-Jan-12	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



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Project Name: Suriname - Merian Gold 2011 / 113-93245
Work Order: **W1L0443**
Reported: 05-Jan-12 16:24

Quality Control - LABORATORY CONTROL SAMPLE Data (Continued)

Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Classical Chemistry Parameters (Continued)

USDA HB60(24)	Total Organic Carbon	%	0.301	0.269	112	80 - 120	W201046	05-Jan-12	
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Quality Control - DUPLICATE Data

Method	Analyte	Units	Duplicate Result	Sample Result	RPD	RPD Limit	Batch ID	Analyzed	Notes
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Metals (Total)

EPA 6020	Arsenic	mg/kg	0.801	1.04	26.1	20	W153005	05-Jan-12	D1
EPA 6020	Cadmium	mg/kg	<0.100	<0.100	UDL	20	W153005	05-Jan-12	D1
EPA 6020	Lead	mg/kg	4.24	5.31	22.4	20	W153005	05-Jan-12	D1
EPA 6020	Selenium	mg/kg	0.850	0.857	0.9	20	W153005	05-Jan-12	D1
EPA 6020	Silver	mg/kg	<0.0500	<0.0500	<RL	20	W153005	05-Jan-12	D1
EPA 6020	Thallium	mg/kg	<0.100	<0.100	<RL	20	W153005	05-Jan-12	D1

Classical Chemistry Parameters

SM 4500-CN-1	Cyanide (WAD)	mg/kg	<0.500	<0.500	UDL	20	W153036	28-Dec-11	
SW846 9012B	Cyanide (total)	mg/kg	<0.50	<0.50	UDL	20	W153035	28-Dec-11	
SW-846 9213	Cyanide (free)	mg/kg	<1.00	<1.00	<RL	20	W153078	30-Dec-11	
USDA HB60(24)	Total Organic Matter	%	0.252	0.272	7.4	20	W201046	05-Jan-12	
USDA HB60(24)	Total Organic Carbon	%	0.146	0.158	7.4	20	W201046	05-Jan-12	

Quality Control - MATRIX SPIKE Data

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Total)

EPA 6020	Arsenic	mg/kg	2.52	1.04	2.50	59.0	75 - 125	W153005	05-Jan-12	D1,M2
EPA 6020	Cadmium	mg/kg	2.63	<0.100	2.50	105	75 - 125	W153005	05-Jan-12	D1
EPA 6020	Lead	mg/kg	7.41	5.31	2.50	83.9	75 - 125	W153005	05-Jan-12	D1
EPA 6020	Selenium	mg/kg	2.59	0.857	2.50	69.2	75 - 125	W153005	05-Jan-12	D1,M2
EPA 6020	Silver	mg/kg	2.60	<0.0500	2.50	102	75 - 125	W153005	05-Jan-12	D1
EPA 6020	Thallium	mg/kg	2.39	<0.100	2.50	94.9	75 - 125	W153005	05-Jan-12	D1

Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Aluminum	mg/kg	15600	4370	100	R > 4S	75 - 125	W153064	04-Jan-12	M3
EPA 6010B	Chromium	mg/kg	132	18.7	100	114	75 - 125	W153064	04-Jan-12	
EPA 6010B	Copper	mg/kg	104	5.04	100	99.4	75 - 125	W153064	04-Jan-12	
EPA 6010B	Iron	mg/kg	13900	12600	1000	R > 4S	75 - 125	W153064	04-Jan-12	M3
EPA 6010B	Manganese	mg/kg	137	36.4	100	101	75 - 125	W153064	04-Jan-12	
EPA 6010B	Nickel	mg/kg	105	2.23	100	103	75 - 125	W153064	04-Jan-12	
EPA 6010B	Vanadium	mg/kg	125	16.9	100	108	75 - 125	W153064	04-Jan-12	
EPA 6010B	Zinc	mg/kg	109	9.36	100	99.7	75 - 125	W153064	04-Jan-12	
EPA 7471A	Mercury	mg/kg	0.345	0.140	0.167	123	75 - 125	W153049	28-Dec-11	H3

Classical Chemistry Parameters

SM 4500-CN-1	Cyanide (WAD)	mg/kg	4.15	<0.500	4.00	104	75 - 125	W153036	28-Dec-11	
SM 4500-CN-1	Cyanide (WAD)	mg/kg	3.90	<0.500	4.00	97.5	75 - 125	W153036	28-Dec-11	
SW846 9012B	Cyanide (total)	mg/kg	4.01	<0.50	4.00	100	90 - 110	W153035	28-Dec-11	
SW846 9012B	Cyanide (total)	mg/kg	3.94	<0.50	4.00	95.0	90 - 110	W153035	28-Dec-11	
SW-846 9213	Cyanide (free)	mg/kg	9.42	<1.00	10.0	92.9	85 - 115	W153078	30-Dec-11	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



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Project Name: Suriname - Merian Gold 2011 / 113-93245
Work Order: **W1L0443**
Reported: 05-Jan-12 16:24

Quality Control - MATRIX SPIKE Data (Continued)

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Classical Chemistry Parameters (Continued)

SW-846 9213	Cyanide (free)	mg/kg	10.5	<1.00	10.0	103	85 - 115	W153078	30-Dec-11	
USDA HB60(24)	Total Organic Matter	%	3.34	0.272	2.92	105	75 - 125	W201046	05-Jan-12	
USDA HB60(24)	Total Organic Carbon	%	1.94	0.158	1.69	105	75 - 125	W201046	05-Jan-12	

Quality Control - MATRIX SPIKE DUPLICATE Data

Method	Analyte	Units	MSD Result	Spike Result	Spike Level	RPD	RPD Limit	Batch ID	Analyzed	Notes
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Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Aluminum	mg/kg	15400	15600	100	0.9	20	W153064	04-Jan-12	
EPA 6010B	Chromium	mg/kg	133	132	100	0.6	20	W153064	04-Jan-12	
EPA 6010B	Copper	mg/kg	105	104	100	0.5	20	W153064	04-Jan-12	
EPA 6010B	Iron	mg/kg	14100	13900	1000	1.1	20	W153064	04-Jan-12	
EPA 6010B	Manganese	mg/kg	139	137	100	1.4	20	W153064	04-Jan-12	
EPA 6010B	Nickel	mg/kg	106	105	100	0.6	20	W153064	04-Jan-12	
EPA 6010B	Vanadium	mg/kg	126	125	100	0.7	20	W153064	04-Jan-12	
EPA 6010B	Zinc	mg/kg	108	109	100	0.6	20	W153064	04-Jan-12	
EPA 7471A	Mercury	mg/kg	0.340	0.345	0.167	1.5	20	W153049	28-Dec-11	H3

Classical Chemistry Parameters

SW846 9012B	Cyanide (total)	mg/kg	3.94	4.01	4.00	1.8	20	W153035	28-Dec-11	
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Quality Control - POST DIGESTION SPIKE Data

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Total)

EPA 6020	Arsenic	mg/kg	3.66	1.04	2.50	105	75 - 125	W153005	05-Jan-12	D1
EPA 6020	Cadmium	mg/kg	2.62	<0.100	2.50	105	75 - 125	W153005	05-Jan-12	D1
EPA 6020	Lead	mg/kg	7.73	5.31	2.50	96.7	75 - 125	W153005	05-Jan-12	D1
EPA 6020	Selenium	mg/kg	3.57	0.857	2.50	108	75 - 125	W153005	05-Jan-12	D1
EPA 6020	Silver	mg/kg	2.57	<0.0500	2.50	101	75 - 125	W153005	05-Jan-12	D1
EPA 6020	Thallium	mg/kg	2.48	<0.1000	2.50	98.5	75 - 125	W153005	05-Jan-12	D1



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0443**

Reported: 05-Jan-12 16:24

Notes and Definitions

D1	Sample required dilution due to matrix.
H3	Sample was received and analyzed past holding time.
M2	Matrix spike recovery was low, but the LCS recovery was acceptable.
M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to spike level. The LCS was acceptable.
LCS	Laboratory Control Sample (Blank Spike)
RPD	Relative Percent Difference
UDL	A result is less than the detection limit
R > 4S	% recovery not applicable, sample concentration more than four times greater than spike level
<RL	A result is less than the reporting limit
MRL	Method Reporting Limit
MDL	Method Detection Limit
N/A	Not Applicable



Golder Associates (WA)
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Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0444**

Reported: 05-Jan-12 16:26

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Sampled By	Date Received
11212011SD011	W1L0444-01	Soil	21-Nov-11 14:00	DH/JE	30-Nov-2011
11212011SD012	W1L0444-02	Soil	21-Nov-11 15:00	DH/JE	30-Nov-2011
11212011SD013	W1L0444-03	Soil	21-Nov-11 15:30	DH/JE	30-Nov-2011
11222011SD015	W1L0444-04	Soil	22-Nov-11 16:00	DH/JE	30-Nov-2011
11242011SD017	W1L0444-05	Soil	24-Nov-11 11:35	DH/JE	30-Nov-2011
11242011SD018	W1L0444-06	Soil	24-Nov-11 13:50	DH/JE	30-Nov-2011
11242011SD019	W1L0444-07	Soil	24-Nov-11 15:15	DH/JE	30-Nov-2011
11252011SD020	W1L0444-08	Soil	25-Nov-11 09:30	DH/JE	30-Nov-2011
11252011SD120	W1L0444-09	Soil	25-Nov-11 09:30	DH/JE	30-Nov-2011
11262011SD021	W1L0444-10	Soil	26-Nov-11 10:45	DH/JE	30-Nov-2011
11242011SD119	W1L0444-11	Soil	24-Nov-11 00:00	DH/JE	30-Nov-2011

Solid samples are analyzed on an as-received, wet-weight basis, unless otherwise requested. Non-Detects are reported at the MDL.

Sample preparation is defined by the client as per their Data Quality Objectives.

This report supercedes any previous reports for this Work Order. The complete report includes pages for each sample, a full QC report, and a notes section.

The results presented in this report relate only to the samples, and meet all requirements of the NELAC Standards unless otherwise noted.

Case Narrative

The sediment samples on this work order have been sieved with a #230 mesh sieve.



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Golder Associates (WA)
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Redmond, WA 98052-3333

Project Name: **Suriname - Merian Gold 2011 / 113-93245**

Work Order: **W1L0444**

Reported: 05-Jan-12 16:26

Client Sample ID: **11212011SD011**

SVL Sample ID: **W1L0444-01 (Soil)**

Sample Report Page 1 of 1

Sampled: 21-Nov-11 14:00

Received: 30-Nov-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total)										
EPA 6020	Arsenic	< 0.300	mg/kg	0.300	0.060	5	W153005	KWH	01/05/12 09:22	D1
EPA 6020	Cadmium	< 0.100	mg/kg	0.100	0.018	5	W153005	KWH	01/05/12 09:22	D1
EPA 6020	Lead	2.21	mg/kg	0.100	0.0125	5	W153005	KWH	01/05/12 09:22	D1
EPA 6020	Selenium	< 0.300	mg/kg	0.300	0.175	5	W153005	KWH	01/05/12 09:22	D1
EPA 6020	Silver	< 0.0500	mg/kg	0.0500	0.0085	5	W153005	KWH	01/05/12 09:22	D1
EPA 6020	Thallium	< 0.100	mg/kg	0.100	0.0033	5	W153005	KWH	01/05/12 09:22	D1

Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Aluminum	4120	mg/kg	8.0	1.6		W153064	DT	01/04/12 10:26	
EPA 6010B	Chromium	44.2	mg/kg	0.60	0.05		W153064	DT	01/04/12 10:27	
EPA 6010B	Copper	21.3	mg/kg	1.00	0.21		W153064	DT	01/04/12 10:27	
EPA 6010B	Iron	29500	mg/kg	6.0	1.1		W153064	DT	01/04/12 10:26	
EPA 6010B	Manganese	29.1	mg/kg	0.40	0.04		W153064	DT	01/04/12 10:26	
EPA 6010B	Nickel	2.03	mg/kg	1.00	0.22		W153064	DT	01/04/12 10:27	
EPA 6010B	Vanadium	37.7	mg/kg	0.50	0.04		W153064	DT	01/04/12 10:27	
EPA 6010B	Zinc	7.39	mg/kg	1.00	0.09		W153064	DT	01/04/12 10:27	
EPA 7471A	Mercury	0.147	mg/kg	0.033	0.007		W153049	DJA	12/28/11 12:52	H3

Classical Chemistry Parameters

SM 4500-CN-I	Cyanide (WAD)	< 0.500	mg/kg	0.500	0.065		W153036	CFE	12/28/11 14:48	H3
SW846 9012B	Cyanide (total)	< 0.50	mg/kg	0.50	0.10		W153035	CFE	12/28/11 13:12	H3
SW-846 9213	Cyanide (free)	< 1.00	mg/kg	1.00	0.09		W153078	CFE	12/30/11 08:30	H3
USDA HB60(24)	Total Organic Carbon	0.190	%	0.0900	0.0180		W201046	SM	01/05/12 10:20	
USDA HB60(24)	Total Organic Matter	0.327	%	0.150	0.0310		W201046	SM	01/05/12 10:20	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Kirby Gray
Technical Director



Golder Associates (WA)
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Redmond, WA 98052-3333

Project Name: **Suriname - Merian Gold 2011 / 113-93245**

Work Order: **W1L0444**

Reported: 05-Jan-12 16:26

Client Sample ID: **11212011SD012**

SVL Sample ID: **W1L0444-02 (Soil)**

Sample Report Page 1 of 1

Sampled: 21-Nov-11 15:00
Received: 30-Nov-11
Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total)										
EPA 6020	Arsenic	92.6	mg/kg	0.300	0.060	5	W153005	KWH	01/05/12 09:27	D1
EPA 6020	Cadmium	< 0.100	mg/kg	0.100	0.018	5	W153005	KWH	01/05/12 09:27	D1
EPA 6020	Lead	2.85	mg/kg	0.100	0.0125	5	W153005	KWH	01/05/12 09:27	D1
EPA 6020	Selenium	0.750	mg/kg	0.300	0.175	5	W153005	KWH	01/05/12 09:27	D1
EPA 6020	Silver	< 0.0500	mg/kg	0.0500	0.0085	5	W153005	KWH	01/05/12 09:27	D1
EPA 6020	Thallium	< 0.100	mg/kg	0.100	0.0033	5	W153005	KWH	01/05/12 09:27	D1

Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Aluminum	3900	mg/kg	8.0	1.6		W153064	DT	01/04/12 10:31	
EPA 6010B	Chromium	33.3	mg/kg	0.60	0.05		W153064	DT	01/04/12 10:32	
EPA 6010B	Copper	10.8	mg/kg	1.00	0.21		W153064	DT	01/04/12 10:32	
EPA 6010B	Iron	33800	mg/kg	6.0	1.1		W153064	DT	01/04/12 10:31	
EPA 6010B	Manganese	36.5	mg/kg	0.40	0.04		W153064	DT	01/04/12 10:31	
EPA 6010B	Nickel	5.88	mg/kg	1.00	0.22		W153064	DT	01/04/12 10:32	
EPA 6010B	Vanadium	23.1	mg/kg	0.50	0.04		W153064	DT	01/04/12 10:32	
EPA 6010B	Zinc	7.91	mg/kg	1.00	0.09		W153064	DT	01/04/12 10:32	
EPA 7471A	Mercury	0.283	mg/kg	0.033	0.007		W153049	DJA	12/28/11 12:53	H3

Classical Chemistry Parameters

SM 4500-CN-I	Cyanide (WAD)	< 0.500	mg/kg	0.500	0.065		W153036	CFE	12/28/11 14:50	H3
SW846 9012B	Cyanide (total)	< 0.50	mg/kg	0.50	0.10		W153035	CFE	12/28/11 13:14	H3
SW-846 9213	Cyanide (free)	< 1.00	mg/kg	1.00	0.09		W153078	CFE	12/30/11 08:30	H3
USDA HB60(24)	Total Organic Carbon	0.772	%	0.0900	0.0180		W201046	SM	01/05/12 10:20	
USDA HB60(24)	Total Organic Matter	1.33	%	0.150	0.0310		W201046	SM	01/05/12 10:20	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Kirby Gray
Technical Director



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Project Name: **Suriname - Merian Gold 2011 / 113-93245**

Work Order: **W1L0444**

Reported: 05-Jan-12 16:26

Client Sample ID: **11212011SD013**

SVL Sample ID: **W1L0444-03 (Soil)**

Sample Report Page 1 of 1

Sampled: 21-Nov-11 15:30
Received: 30-Nov-11
Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total)										
EPA 6020	Arsenic	2.91	mg/kg	0.300	0.060	5	W153005	KWH	01/05/12 09:33	D1
EPA 6020	Cadmium	< 0.100	mg/kg	0.100	0.018	5	W153005	KWH	01/05/12 09:33	D1
EPA 6020	Lead	3.68	mg/kg	0.100	0.0125	5	W153005	KWH	01/05/12 09:33	D1
EPA 6020	Selenium	1.14	mg/kg	0.300	0.175	5	W153005	KWH	01/05/12 09:33	D1
EPA 6020	Silver	< 0.0500	mg/kg	0.0500	0.0085	5	W153005	KWH	01/05/12 09:33	D1
EPA 6020	Thallium	< 0.100	mg/kg	0.100	0.0033	5	W153005	KWH	01/05/12 09:33	D1

Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Aluminum	5060	mg/kg	8.0	1.6		W153064	DT	01/04/12 10:36	
EPA 6010B	Chromium	39.8	mg/kg	0.60	0.05		W153064	DT	01/04/12 10:37	
EPA 6010B	Copper	15.0	mg/kg	1.00	0.21		W153064	DT	01/04/12 10:37	
EPA 6010B	Iron	17400	mg/kg	6.0	1.1		W153064	DT	01/04/12 10:36	
EPA 6010B	Manganese	16.3	mg/kg	0.40	0.04		W153064	DT	01/04/12 10:36	
EPA 6010B	Nickel	4.84	mg/kg	1.00	0.22		W153064	DT	01/04/12 10:37	
EPA 6010B	Vanadium	29.8	mg/kg	0.50	0.04		W153064	DT	01/04/12 10:37	
EPA 6010B	Zinc	8.42	mg/kg	1.00	0.09		W153064	DT	01/04/12 10:38	
EPA 7471A	Mercury	0.147	mg/kg	0.033	0.007		W153049	DJA	12/28/11 12:55	H3

Classical Chemistry Parameters

SM 4500-CN-I	Cyanide (WAD)	< 0.500	mg/kg	0.500	0.065		W153036	CFE	12/28/11 14:58	H3
SW846 9012B	Cyanide (total)	< 0.50	mg/kg	0.50	0.10		W153035	CFE	12/28/11 13:16	H3
SW-846 9213	Cyanide (free)	< 1.00	mg/kg	1.00	0.09		W153078	CFE	12/30/11 08:30	H3
USDA HB60(24)	Total Organic Carbon	0.654	%	0.0900	0.0180		W201046	SM	01/05/12 10:20	
USDA HB60(24)	Total Organic Matter	1.13	%	0.150	0.0310		W201046	SM	01/05/12 10:20	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

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Project Name: **Suriname - Merian Gold 2011 / 113-93245**

Work Order: **W1L0444**

Reported: 05-Jan-12 16:26

Client Sample ID: **11222011SD015**

SVL Sample ID: **W1L0444-04 (Soil)**

Sample Report Page 1 of 1

Sampled: 22-Nov-11 16:00
Received: 30-Nov-11
Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 6020	Arsenic	0.452	mg/kg	0.300	0.060	5	W153005	KWH	01/05/12 09:38	D1
EPA 6020	Cadmium	< 0.100	mg/kg	0.100	0.018	5	W153005	KWH	01/05/12 09:38	D1
EPA 6020	Lead	2.80	mg/kg	0.100	0.0125	5	W153005	KWH	01/05/12 09:38	D1
EPA 6020	Selenium	0.937	mg/kg	0.300	0.175	5	W153005	KWH	01/05/12 09:38	D1
EPA 6020	Silver	< 0.0500	mg/kg	0.0500	0.0085	5	W153005	KWH	01/05/12 09:38	D1
EPA 6020	Thallium	< 0.100	mg/kg	0.100	0.0033	5	W153005	KWH	01/05/12 09:38	D1

Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Aluminum	5000	mg/kg	8.0	1.6		W153064	DT	01/04/12 10:41	
EPA 6010B	Chromium	23.0	mg/kg	0.60	0.05		W153064	DT	01/04/12 10:42	
EPA 6010B	Copper	14.5	mg/kg	1.00	0.21		W153064	DT	01/04/12 10:42	
EPA 6010B	Iron	11500	mg/kg	6.0	1.1		W153064	DT	01/04/12 10:41	
EPA 6010B	Manganese	18.7	mg/kg	0.40	0.04		W153064	DT	01/04/12 10:41	
EPA 6010B	Nickel	5.69	mg/kg	1.00	0.22		W153064	DT	01/04/12 10:42	
EPA 6010B	Vanadium	19.8	mg/kg	0.50	0.04		W153064	DT	01/04/12 10:42	
EPA 6010B	Zinc	8.08	mg/kg	1.00	0.09		W153064	DT	01/04/12 10:42	
EPA 7471A	Mercury	0.185	mg/kg	0.033	0.007		W153049	DJA	12/28/11 12:57	H3

Classical Chemistry Parameters

SM 4500-CN-I	Cyanide (WAD)	< 0.500	mg/kg	0.500	0.065		W153036	CFE	12/28/11 15:00	H3
SW846 9012B	Cyanide (total)	< 0.50	mg/kg	0.50	0.10		W153035	CFE	12/28/11 13:18	H3
SW-846 9213	Cyanide (free)	< 1.00	mg/kg	1.00	0.09		W153078	CFE	12/30/11 08:30	H3
USDA HB60(24)	Total Organic Carbon	0.827	%	0.0900	0.0180		W201046	SM	01/05/12 10:20	
USDA HB60(24)	Total Organic Matter	1.43	%	0.150	0.0310		W201046	SM	01/05/12 10:20	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Kirby Gray
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Project Name: **Suriname - Merian Gold 2011 / 113-93245**

Work Order: **W1L0444**

Reported: 05-Jan-12 16:26

Client Sample ID: **11242011SD017**

SVL Sample ID: **W1L0444-05 (Soil)**

Sample Report Page 1 of 1

Sampled: 24-Nov-11 11:35

Received: 30-Nov-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total)										
EPA 6020	Arsenic	1.55	mg/kg	0.300	0.060	5	W153005	KWH	01/05/12 09:44	D1
EPA 6020	Cadmium	< 0.100	mg/kg	0.100	0.018	5	W153005	KWH	01/05/12 09:44	D1
EPA 6020	Lead	3.44	mg/kg	0.100	0.0125	5	W153005	KWH	01/05/12 09:44	D1
EPA 6020	Selenium	3.48	mg/kg	0.300	0.175	5	W153005	KWH	01/05/12 09:44	D1
EPA 6020	Silver	< 0.0500	mg/kg	0.0500	0.0085	5	W153005	KWH	01/05/12 09:44	D1
EPA 6020	Thallium	< 0.100	mg/kg	0.100	0.0033	5	W153005	KWH	01/05/12 09:44	D1

Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Aluminum	2500	mg/kg	8.0	1.6		W153064	DT	01/04/12 10:46	
EPA 6010B	Chromium	17.7	mg/kg	0.60	0.05		W153064	DT	01/04/12 10:47	
EPA 6010B	Copper	6.50	mg/kg	1.00	0.21		W153064	DT	01/04/12 10:47	
EPA 6010B	Iron	4680	mg/kg	6.0	1.1		W153064	DT	01/04/12 10:46	
EPA 6010B	Manganese	11.9	mg/kg	0.40	0.04		W153064	DT	01/04/12 10:46	
EPA 6010B	Nickel	3.47	mg/kg	1.00	0.22		W153064	DT	01/04/12 10:47	
EPA 6010B	Vanadium	12.6	mg/kg	0.50	0.04		W153064	DT	01/04/12 10:47	
EPA 6010B	Zinc	6.60	mg/kg	1.00	0.09		W153064	DT	01/04/12 10:48	
EPA 7471A	Mercury	0.427	mg/kg	0.033	0.007		W153049	DJA	12/28/11 12:58	H3

Classical Chemistry Parameters

SM 4500-CN-I	Cyanide (WAD)	< 0.500	mg/kg	0.500	0.065		W153036	CFE	12/28/11 15:02	H3
SW846 9012B	Cyanide (total)	< 0.50	mg/kg	0.50	0.10		W153035	CFE	12/28/11 13:20	H3
SW-846 9213	Cyanide (free)	< 1.00	mg/kg	1.00	0.09		W153078	CFE	12/30/11 08:30	H3
USDA HB60(24)	Total Organic Carbon	0.269	%	0.0900	0.0180		W201046	SM	01/05/12 10:20	
USDA HB60(24)	Total Organic Matter	0.464	%	0.150	0.0310		W201046	SM	01/05/12 10:20	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Kirby Gray
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Project Name: **Suriname - Merian Gold 2011 / 113-93245**

Work Order: **W1L0444**

Reported: 05-Jan-12 16:26

Client Sample ID: **11242011SD018**

SVL Sample ID: **W1L0444-06 (Soil)**

Sampled: 24-Nov-11 13:50

Received: 30-Nov-11

Sampled By: DH/JE

Sample Report Page 1 of 1

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total)										
EPA 6020	Arsenic	0.926	mg/kg	0.300	0.060	5	W153005	KWH	01/05/12 09:49	D1
EPA 6020	Cadmium	< 0.100	mg/kg	0.100	0.018	5	W153005	KWH	01/05/12 09:49	D1
EPA 6020	Lead	4.59	mg/kg	0.100	0.0125	5	W153005	KWH	01/05/12 09:49	D1
EPA 6020	Selenium	0.718	mg/kg	0.300	0.175	5	W153005	KWH	01/05/12 09:49	D1
EPA 6020	Silver	< 0.0500	mg/kg	0.0500	0.0085	5	W153005	KWH	01/05/12 09:49	D1
EPA 6020	Thallium	< 0.100	mg/kg	0.100	0.0033	5	W153005	KWH	01/05/12 09:49	D1

Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Aluminum	7160	mg/kg	8.0	1.6		W153064	DT	01/04/12 10:51	
EPA 6010B	Chromium	36.2	mg/kg	0.60	0.05		W153064	DT	01/04/12 10:52	
EPA 6010B	Copper	4.78	mg/kg	1.00	0.21		W153064	DT	01/04/12 10:52	
EPA 6010B	Iron	13400	mg/kg	6.0	1.1		W153064	DT	01/04/12 10:51	
EPA 6010B	Manganese	11.3	mg/kg	0.40	0.04		W153064	DT	01/04/12 10:51	
EPA 6010B	Nickel	3.19	mg/kg	1.00	0.22		W153064	DT	01/04/12 10:52	
EPA 6010B	Vanadium	28.0	mg/kg	0.50	0.04		W153064	DT	01/04/12 10:52	
EPA 6010B	Zinc	6.32	mg/kg	1.00	0.09		W153064	DT	01/04/12 10:53	
EPA 7471A	Mercury	0.102	mg/kg	0.033	0.007		W153049	DJA	12/28/11 13:00	H3

Classical Chemistry Parameters

SM 4500-CN-I	Cyanide (WAD)	< 0.500	mg/kg	0.500	0.065		W153036	CFE	12/28/11 15:04	H3
SW846 9012B	Cyanide (total)	< 0.50	mg/kg	0.50	0.10		W153035	CFE	12/28/11 13:22	H3
SW-846 9213	Cyanide (free)	< 1.00	mg/kg	1.00	0.09		W153078	CFE	12/30/11 08:30	H3
USDA HB60(24)	Total Organic Carbon	0.779	%	0.0900	0.0180		W201046	SM	01/05/12 10:20	
USDA HB60(24)	Total Organic Matter	1.34	%	0.150	0.0310		W201046	SM	01/05/12 10:20	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Kirby Gray
Technical Director



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Golder Associates (WA)
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Redmond, WA 98052-3333

Project Name: **Suriname - Merian Gold 2011 / 113-93245**

Work Order: **W1L0444**

Reported: 05-Jan-12 16:26

Client Sample ID: **11242011SD019**

SVL Sample ID: **W1L0444-07 (Soil)**

Sample Report Page 1 of 1

Sampled: 24-Nov-11 15:15

Received: 30-Nov-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total)										
EPA 6020	Arsenic	< 0.300	mg/kg	0.300	0.060	5	W153005	KWH	01/05/12 09:55	D1
EPA 6020	Cadmium	< 0.100	mg/kg	0.100	0.018	5	W153005	KWH	01/05/12 09:55	D1
EPA 6020	Lead	3.20	mg/kg	0.100	0.0125	5	W153005	KWH	01/05/12 09:55	D1
EPA 6020	Selenium	0.691	mg/kg	0.300	0.175	5	W153005	KWH	01/05/12 09:55	D1
EPA 6020	Silver	< 0.0500	mg/kg	0.0500	0.0085	5	W153005	KWH	01/05/12 09:55	D1
EPA 6020	Thallium	< 0.100	mg/kg	0.100	0.0033	5	W153005	KWH	01/05/12 09:55	D1

Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Aluminum	4290	mg/kg	8.0	1.6		W153064	DT	01/04/12 10:56	
EPA 6010B	Chromium	38.3	mg/kg	0.60	0.05		W153064	DT	01/04/12 10:58	
EPA 6010B	Copper	22.5	mg/kg	1.00	0.21		W153064	DT	01/04/12 10:58	
EPA 6010B	Iron	20400	mg/kg	6.0	1.1		W153064	DT	01/04/12 10:56	
EPA 6010B	Manganese	48.4	mg/kg	0.40	0.04		W153064	DT	01/04/12 10:56	
EPA 6010B	Nickel	3.78	mg/kg	1.00	0.22		W153064	DT	01/04/12 10:58	
EPA 6010B	Vanadium	33.4	mg/kg	0.50	0.04		W153064	DT	01/04/12 10:58	
EPA 6010B	Zinc	10.3	mg/kg	1.00	0.09		W153064	DT	01/04/12 10:58	
EPA 7471A	Mercury	0.165	mg/kg	0.033	0.007		W153049	DJA	12/28/11 13:01	H3

Classical Chemistry Parameters

SM 4500-CN-I	Cyanide (WAD)	< 0.500	mg/kg	0.500	0.065		W153036	CFE	12/28/11 15:06	H3
SW846 9012B	Cyanide (total)	< 0.50	mg/kg	0.50	0.10		W153035	CFE	12/28/11 13:24	H3
SW-846 9213	Cyanide (free)	< 1.00	mg/kg	1.00	0.09		W153078	CFE	12/30/11 08:30	H3
USDA HB60(24)	Total Organic Carbon	0.346	%	0.0900	0.0180		W201046	SM	01/05/12 10:20	
USDA HB60(24)	Total Organic Matter	0.597	%	0.150	0.0310		W201046	SM	01/05/12 10:20	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

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Project Name: **Suriname - Merian Gold 2011 / 113-93245**

Work Order: **W1L0444**

Reported: 05-Jan-12 16:26

Client Sample ID: **11252011SD020**

SVL Sample ID: **W1L0444-08 (Soil)**

Sample Report Page 1 of 1

Sampled: 25-Nov-11 09:30

Received: 30-Nov-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total)										
EPA 6020	Arsenic	8.98	mg/kg	0.300	0.060	5	W153005	KWH	01/05/12 10:11	D1
EPA 6020	Cadmium	< 0.100	mg/kg	0.100	0.018	5	W153005	KWH	01/05/12 10:11	D1
EPA 6020	Lead	5.37	mg/kg	0.100	0.0125	5	W153005	KWH	01/05/12 10:11	D1
EPA 6020	Selenium	0.601	mg/kg	0.300	0.175	5	W153005	KWH	01/05/12 10:11	D1
EPA 6020	Silver	< 0.0500	mg/kg	0.0500	0.0085	5	W153005	KWH	01/05/12 10:11	D1
EPA 6020	Thallium	< 0.100	mg/kg	0.100	0.0033	5	W153005	KWH	01/05/12 10:11	D1

Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Aluminum	7410	mg/kg	8.0	1.6		W153064	DT	01/04/12 11:01	
EPA 6010B	Chromium	59.9	mg/kg	0.60	0.05		W153064	DT	01/04/12 11:03	
EPA 6010B	Copper	17.1	mg/kg	1.00	0.21		W153064	DT	01/04/12 11:03	
EPA 6010B	Iron	29600	mg/kg	6.0	1.1		W153064	DT	01/04/12 11:01	
EPA 6010B	Manganese	87.8	mg/kg	0.40	0.04		W153064	DT	01/04/12 11:01	
EPA 6010B	Nickel	11.0	mg/kg	1.00	0.22		W153064	DT	01/04/12 11:03	
EPA 6010B	Vanadium	32.0	mg/kg	0.50	0.04		W153064	DT	01/04/12 11:03	
EPA 6010B	Zinc	18.0	mg/kg	1.00	0.09		W153064	DT	01/04/12 11:03	
EPA 7471A	Mercury	0.518	mg/kg	0.033	0.007		W153049	DJA	12/28/11 13:03	H3

Classical Chemistry Parameters

SM 4500-CN-I	Cyanide (WAD)	< 0.500	mg/kg	0.500	0.065		W153036	CFE	12/28/11 15:08	H3
SW846 9012B	Cyanide (total)	< 0.50	mg/kg	0.50	0.10		W153035	CFE	12/28/11 13:32	H3
SW-846 9213	Cyanide (free)	< 1.00	mg/kg	1.00	0.09		W153078	CFE	12/30/11 08:30	H3
USDA HB60(24)	Total Organic Carbon	0.495	%	0.0900	0.0180		W201046	SM	01/05/12 10:20	
USDA HB60(24)	Total Organic Matter	0.853	%	0.150	0.0310		W201046	SM	01/05/12 10:20	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

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Project Name: **Suriname - Merian Gold 2011 / 113-93245**

Work Order: **W1L0444**

Reported: 05-Jan-12 16:26

Client Sample ID: **11252011SD120**

SVL Sample ID: **W1L0444-09 (Soil)**

Sample Report Page 1 of 1

Sampled: 25-Nov-11 09:30

Received: 30-Nov-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total)										
EPA 6020	Arsenic	7.71	mg/kg	0.300	0.060	5	W153005	KWH	01/05/12 10:16	D1
EPA 6020	Cadmium	< 0.100	mg/kg	0.100	0.018	5	W153005	KWH	01/05/12 10:16	D1
EPA 6020	Lead	4.89	mg/kg	0.100	0.0125	5	W153005	KWH	01/05/12 10:16	D1
EPA 6020	Selenium	0.519	mg/kg	0.300	0.175	5	W153005	KWH	01/05/12 10:16	D1
EPA 6020	Silver	< 0.0500	mg/kg	0.0500	0.0085	5	W153005	KWH	01/05/12 10:16	D1
EPA 6020	Thallium	< 0.100	mg/kg	0.100	0.0033	5	W153005	KWH	01/05/12 10:16	D1

Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Aluminum	7150	mg/kg	8.0	1.6		W153064	DT	01/04/12 11:07	
EPA 6010B	Chromium	60.9	mg/kg	0.60	0.05		W153064	DT	01/04/12 11:08	
EPA 6010B	Copper	16.5	mg/kg	1.00	0.21		W153064	DT	01/04/12 11:08	
EPA 6010B	Iron	29600	mg/kg	6.0	1.1		W153064	DT	01/04/12 11:06	
EPA 6010B	Manganese	88.2	mg/kg	0.40	0.04		W153064	DT	01/04/12 11:07	
EPA 6010B	Nickel	10.9	mg/kg	1.00	0.22		W153064	DT	01/04/12 11:08	
EPA 6010B	Vanadium	32.6	mg/kg	0.50	0.04		W153064	DT	01/04/12 11:08	
EPA 6010B	Zinc	17.7	mg/kg	1.00	0.09		W153064	DT	01/04/12 11:08	
EPA 7471A	Mercury	0.505	mg/kg	0.033	0.007		W153049	DJA	12/28/11 13:05	H3

Classical Chemistry Parameters

SM 4500-CN-I	Cyanide (WAD)	< 0.500	mg/kg	0.500	0.065		W153036	CFE	12/28/11 15:10	H3
SW846 9012B	Cyanide (total)	< 0.50	mg/kg	0.50	0.10		W153035	CFE	12/28/11 13:34	H3
SW-846 9213	Cyanide (free)	< 1.00	mg/kg	1.00	0.09		W153078	CFE	12/30/11 08:30	H3
USDA HB60(24)	Total Organic Carbon	0.525	%	0.0900	0.0180		W201046	SM	01/05/12 10:20	
USDA HB60(24)	Total Organic Matter	0.905	%	0.150	0.0310		W201046	SM	01/05/12 10:20	

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Project Name: **Suriname - Merian Gold 2011 / 113-93245**

Work Order: **W1L0444**

Reported: 05-Jan-12 16:26

Client Sample ID: **11262011SD021**

SVL Sample ID: **W1L0444-10 (Soil)**

Sample Report Page 1 of 1

Sampled: 26-Nov-11 10:45

Received: 30-Nov-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total)										
EPA 6020	Arsenic	1.45	mg/kg	0.300	0.060	5	W153005	KWH	01/05/12 10:22	D1
EPA 6020	Cadmium	< 0.100	mg/kg	0.100	0.018	5	W153005	KWH	01/05/12 10:22	D1
EPA 6020	Lead	7.18	mg/kg	0.100	0.0125	5	W153005	KWH	01/05/12 10:22	D1
EPA 6020	Selenium	0.908	mg/kg	0.300	0.175	5	W153005	KWH	01/05/12 10:22	D1
EPA 6020	Silver	< 0.0500	mg/kg	0.0500	0.0085	5	W153005	KWH	01/05/12 10:22	D1
EPA 6020	Thallium	< 0.100	mg/kg	0.100	0.0033	5	W153005	KWH	01/05/12 10:22	D1

Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Aluminum	5680	mg/kg	8.0	1.6		W153064	DT	01/04/12 11:22	
EPA 6010B	Chromium	39.7	mg/kg	0.60	0.05		W153064	DT	01/04/12 11:23	
EPA 6010B	Copper	11.6	mg/kg	1.00	0.21		W153064	DT	01/04/12 11:23	
EPA 6010B	Iron	8940	mg/kg	6.0	1.1		W153064	DT	01/04/12 11:22	
EPA 6010B	Manganese	94.4	mg/kg	0.40	0.04		W153064	DT	01/04/12 11:22	
EPA 6010B	Nickel	8.92	mg/kg	1.00	0.22		W153064	DT	01/04/12 11:23	
EPA 6010B	Vanadium	16.9	mg/kg	0.50	0.04		W153064	DT	01/04/12 11:23	
EPA 6010B	Zinc	14.5	mg/kg	1.00	0.09		W153064	DT	01/04/12 11:23	
EPA 7471A	Mercury	0.153	mg/kg	0.033	0.007		W153049	DJA	12/28/11 13:10	H3

Classical Chemistry Parameters

SM 4500-CN-I	Cyanide (WAD)	< 0.500	mg/kg	0.500	0.065		W153036	CFE	12/28/11 15:12	H3
SW846 9012B	Cyanide (total)	< 0.50	mg/kg	0.50	0.10		W153035	CFE	12/28/11 13:36	H3
SW-846 9213	Cyanide (free)	< 1.00	mg/kg	1.00	0.09		W153078	CFE	12/30/11 08:30	H3
USDA HB60(24)	Total Organic Carbon	2.49	%	0.0900	0.0180		W201046	SM	01/05/12 10:20	
USDA HB60(24)	Total Organic Matter	4.29	%	0.150	0.0310		W201046	SM	01/05/12 10:20	

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Technical Director



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Project Name: **Suriname - Merian Gold 2011 / 113-93245**

Work Order: **W1L0444**

Reported: 05-Jan-12 16:26

Client Sample ID: **11242011SD119**

SVL Sample ID: **W1L0444-11 (Soil)**

Sample Report Page 1 of 1

Sampled: 24-Nov-11 00:00

Received: 30-Nov-11

Sampled By: DH/JE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total)										
EPA 6020	Arsenic	< 0.300	mg/kg	0.300	0.060	5	W153005	KWH	01/05/12 10:27	D1
EPA 6020	Cadmium	< 0.100	mg/kg	0.100	0.018	5	W153005	KWH	01/05/12 10:27	D1
EPA 6020	Lead	3.15	mg/kg	0.100	0.0125	5	W153005	KWH	01/05/12 10:27	D1
EPA 6020	Selenium	0.710	mg/kg	0.300	0.175	5	W153005	KWH	01/05/12 10:27	D1
EPA 6020	Silver	< 0.0500	mg/kg	0.0500	0.0085	5	W153005	KWH	01/05/12 10:27	D1
EPA 6020	Thallium	< 0.100	mg/kg	0.100	0.0033	5	W153005	KWH	01/05/12 10:27	D1

Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Aluminum	4200	mg/kg	8.0	1.6		W153064	DT	01/04/12 11:27	
EPA 6010B	Chromium	38.2	mg/kg	0.60	0.05		W153064	DT	01/04/12 11:28	
EPA 6010B	Copper	22.3	mg/kg	1.00	0.21		W153064	DT	01/04/12 11:28	
EPA 6010B	Iron	20300	mg/kg	6.0	1.1		W153064	DT	01/04/12 11:27	
EPA 6010B	Manganese	46.9	mg/kg	0.40	0.04		W153064	DT	01/04/12 11:27	
EPA 6010B	Nickel	3.77	mg/kg	1.00	0.22		W153064	DT	01/04/12 11:28	
EPA 6010B	Vanadium	33.0	mg/kg	0.50	0.04		W153064	DT	01/04/12 11:28	
EPA 6010B	Zinc	9.89	mg/kg	1.00	0.09		W153064	DT	01/04/12 11:29	
EPA 7471A	Mercury	0.155	mg/kg	0.033	0.007		W153049	DJA	12/28/11 13:11	H3

Classical Chemistry Parameters

SM 4500-CN-I	Cyanide (WAD)	< 0.500	mg/kg	0.500	0.065		W153036	CFE	12/28/11 15:14	H3
SW846 9012B	Cyanide (total)	< 0.50	mg/kg	0.50	0.10		W153035	CFE	12/28/11 13:38	H3
SW-846 9213	Cyanide (free)	< 1.00	mg/kg	1.00	0.09		W153078	CFE	12/30/11 08:30	H3
USDA HB60(24)	Total Organic Carbon	0.303	%	0.0900	0.0180		W201046	SM	01/05/12 10:20	
USDA HB60(24)	Total Organic Matter	0.523	%	0.150	0.0310		W201046	SM	01/05/12 10:20	

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Kirby Gray
Technical Director



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Project Name: **Suriname - Merian Gold 2011 / 113-93245**

Work Order: **W1L0444**

Reported: 05-Jan-12 16:26

Quality Control - BLANK Data

Method	Analyte	Units	Result	MDL	MRL	Batch ID	Analyzed	Notes
Metals (Total)								
EPA 6020	Arsenic	mg/kg	<0.300	0.060	0.300	W153005	05-Jan-12	D1
EPA 6020	Cadmium	mg/kg	<0.100	0.018	0.100	W153005	05-Jan-12	D1
EPA 6020	Lead	mg/kg	<0.100	0.0125	0.100	W153005	05-Jan-12	D1
EPA 6020	Selenium	mg/kg	<0.300	0.175	0.300	W153005	05-Jan-12	D1
EPA 6020	Silver	mg/kg	<0.0500	0.0085	0.0500	W153005	05-Jan-12	D1
EPA 6020	Thallium	mg/kg	<0.100	0.0033	0.100	W153005	05-Jan-12	D1

Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Aluminum	mg/kg	<8.0	1.6	8.0	W153064	04-Jan-12	
EPA 6010B	Chromium	mg/kg	<0.60	0.05	0.60	W153064	04-Jan-12	
EPA 6010B	Copper	mg/kg	<1.00	0.21	1.00	W153064	04-Jan-12	
EPA 6010B	Iron	mg/kg	<6.0	1.1	6.0	W153064	04-Jan-12	
EPA 6010B	Manganese	mg/kg	<0.40	0.04	0.40	W153064	04-Jan-12	
EPA 6010B	Nickel	mg/kg	<1.00	0.22	1.00	W153064	04-Jan-12	
EPA 6010B	Vanadium	mg/kg	<0.50	0.04	0.50	W153064	04-Jan-12	
EPA 6010B	Zinc	mg/kg	<1.00	0.09	1.00	W153064	04-Jan-12	
EPA 7471A	Mercury	mg/kg	<0.033	0.007	0.033	W153049	28-Dec-11	

Classical Chemistry Parameters

SM 4500-CN-I	Cyanide (WAD)	mg/kg	<0.500	0.065	0.500	W153036	28-Dec-11	
SW846 9012B	Cyanide (total)	mg/kg	<0.50	0.10	0.50	W153035	28-Dec-11	
SW-846 9213	Cyanide (free)	mg/kg	<1.00	0.09	1.00	W153078	30-Dec-11	
USDA HB60(24)	Total Organic Matter	%	<0.150	0.0310	0.150	W201046	05-Jan-12	
USDA HB60(24)	Total Organic Carbon	%	<0.0900	0.0180	0.0900	W201046	05-Jan-12	

Quality Control - LABORATORY CONTROL SAMPLE Data

Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
Metals (Total)									
EPA 6020	Arsenic	mg/kg	2.63	2.50	105	80 - 120	W153005	05-Jan-12	D1
EPA 6020	Cadmium	mg/kg	2.63	2.50	105	80 - 120	W153005	05-Jan-12	D1
EPA 6020	Lead	mg/kg	2.46	2.50	98.5	80 - 120	W153005	05-Jan-12	D1
EPA 6020	Selenium	mg/kg	2.73	2.50	109	80 - 120	W153005	05-Jan-12	D1
EPA 6020	Silver	mg/kg	2.58	2.50	103	80 - 120	W153005	05-Jan-12	D1
EPA 6020	Thallium	mg/kg	2.45	2.50	98.0	80 - 120	W153005	05-Jan-12	D1

Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Aluminum	mg/kg	95.8	100	95.8	80 - 120	W153064	04-Jan-12	
EPA 6010B	Chromium	mg/kg	91.7	100	91.7	80 - 120	W153064	04-Jan-12	
EPA 6010B	Copper	mg/kg	86.7	100	86.7	80 - 120	W153064	04-Jan-12	
EPA 6010B	Iron	mg/kg	994	1000	99.4	80 - 120	W153064	04-Jan-12	
EPA 6010B	Manganese	mg/kg	92.2	100	92.2	80 - 120	W153064	04-Jan-12	
EPA 6010B	Nickel	mg/kg	86.6	100	86.6	80 - 120	W153064	04-Jan-12	
EPA 6010B	Vanadium	mg/kg	93.2	100	93.2	80 - 120	W153064	04-Jan-12	
EPA 6010B	Zinc	mg/kg	86.5	100	86.5	80 - 120	W153064	04-Jan-12	
EPA 7471A	Mercury	mg/kg	0.830	0.833	99.6	80 - 120	W153049	28-Dec-11	

Classical Chemistry Parameters

SM 4500-CN-I	Cyanide (WAD)	mg/kg	1.55	1.50	103	80 - 120	W153036	28-Dec-11	
SW846 9012B	Cyanide (total)	mg/kg	9.60	9.60	100	80 - 120	W153035	28-Dec-11	
SW-846 9213	Cyanide (free)	mg/kg	10.4	10.0	104	85 - 115	W153078	30-Dec-11	
USDA HB60(24)	Total Organic Matter	%	0.518	0.464	112	80 - 120	W201046	05-Jan-12	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245
Work Order: **W1L0444**
Reported: 05-Jan-12 16:26

Quality Control - LABORATORY CONTROL SAMPLE Data (Continued)

Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Classical Chemistry Parameters (Continued)

USDA HB60(24)	Total Organic Carbon	%	0.301	0.269	112	80 - 120	W201046	05-Jan-12	
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Quality Control - DUPLICATE Data

Method	Analyte	Units	Duplicate Result	Sample Result	RPD	RPD Limit	Batch ID	Analyzed	Notes
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Metals (Total)

EPA 6020	Arsenic	mg/kg	0.801	1.04	26.1	20	W153005	05-Jan-12	D1
EPA 6020	Cadmium	mg/kg	<0.100	<0.100	UDL	20	W153005	05-Jan-12	D1
EPA 6020	Lead	mg/kg	4.24	5.31	22.4	20	W153005	05-Jan-12	D1
EPA 6020	Selenium	mg/kg	0.850	0.857	0.9	20	W153005	05-Jan-12	D1
EPA 6020	Silver	mg/kg	<0.0500	<0.0500	<RL	20	W153005	05-Jan-12	D1
EPA 6020	Thallium	mg/kg	<0.100	<0.100	<RL	20	W153005	05-Jan-12	D1

Classical Chemistry Parameters

SM 4500-CN-1	Cyanide (WAD)	mg/kg	<0.500	<0.500	UDL	20	W153036	28-Dec-11	
SW846 9012B	Cyanide (total)	mg/kg	<0.50	<0.50	UDL	20	W153035	28-Dec-11	
SW-846 9213	Cyanide (free)	mg/kg	<1.00	<1.00	<RL	20	W153078	30-Dec-11	
USDA HB60(24)	Total Organic Matter	%	0.252	0.272	7.4	20	W201046	05-Jan-12	
USDA HB60(24)	Total Organic Carbon	%	0.146	0.158	7.4	20	W201046	05-Jan-12	

Quality Control - MATRIX SPIKE Data

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Total)

EPA 6020	Arsenic	mg/kg	2.52	1.04	2.50	59.0	75 - 125	W153005	05-Jan-12	D1,M2
EPA 6020	Cadmium	mg/kg	2.63	<0.100	2.50	105	75 - 125	W153005	05-Jan-12	D1
EPA 6020	Lead	mg/kg	7.41	5.31	2.50	83.9	75 - 125	W153005	05-Jan-12	D1
EPA 6020	Selenium	mg/kg	2.59	0.857	2.50	69.2	75 - 125	W153005	05-Jan-12	D1,M2
EPA 6020	Silver	mg/kg	2.60	<0.0500	2.50	102	75 - 125	W153005	05-Jan-12	D1
EPA 6020	Thallium	mg/kg	2.39	<0.100	2.50	94.9	75 - 125	W153005	05-Jan-12	D1

Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Aluminum	mg/kg	15600	4370	100	R > 4S	75 - 125	W153064	04-Jan-12	M3
EPA 6010B	Chromium	mg/kg	132	18.7	100	114	75 - 125	W153064	04-Jan-12	
EPA 6010B	Copper	mg/kg	104	5.04	100	99.4	75 - 125	W153064	04-Jan-12	
EPA 6010B	Iron	mg/kg	13900	12600	1000	R > 4S	75 - 125	W153064	04-Jan-12	M3
EPA 6010B	Manganese	mg/kg	137	36.4	100	101	75 - 125	W153064	04-Jan-12	
EPA 6010B	Nickel	mg/kg	105	2.23	100	103	75 - 125	W153064	04-Jan-12	
EPA 6010B	Vanadium	mg/kg	125	16.9	100	108	75 - 125	W153064	04-Jan-12	
EPA 6010B	Zinc	mg/kg	109	9.36	100	99.7	75 - 125	W153064	04-Jan-12	
EPA 7471A	Mercury	mg/kg	0.345	0.140	0.167	123	75 - 125	W153049	28-Dec-11	H3

Classical Chemistry Parameters

SM 4500-CN-1	Cyanide (WAD)	mg/kg	4.15	<0.500	4.00	104	75 - 125	W153036	28-Dec-11	
SM 4500-CN-1	Cyanide (WAD)	mg/kg	3.90	<0.500	4.00	97.5	75 - 125	W153036	28-Dec-11	
SW846 9012B	Cyanide (total)	mg/kg	4.01	<0.50	4.00	100	90 - 110	W153035	28-Dec-11	
SW846 9012B	Cyanide (total)	mg/kg	3.94	<0.50	4.00	95.0	90 - 110	W153035	28-Dec-11	
SW-846 9213	Cyanide (free)	mg/kg	9.42	<1.00	10.0	92.9	85 - 115	W153078	30-Dec-11	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



Golder Associates (WA)
 18300 NE Union Hill Road, Suite 200
 Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0444**

Reported: 05-Jan-12 16:26

Quality Control - MATRIX SPIKE Data (Continued)

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Classical Chemistry Parameters (Continued)

SW-846 9213	Cyanide (free)	mg/kg	10.5	<1.00	10.0	103	85 - 115	W153078	30-Dec-11	
USDA HB60(24)	Total Organic Matter	%	3.34	0.272	2.92	105	75 - 125	W201046	05-Jan-12	
USDA HB60(24)	Total Organic Carbon	%	1.94	0.158	1.69	105	75 - 125	W201046	05-Jan-12	

Quality Control - MATRIX SPIKE DUPLICATE Data

Method	Analyte	Units	MSD Result	Spike Result	Spike Level	RPD	RPD Limit	Batch ID	Analyzed	Notes
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Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Aluminum	mg/kg	15400	15600	100	0.9	20	W153064	04-Jan-12	
EPA 6010B	Chromium	mg/kg	133	132	100	0.6	20	W153064	04-Jan-12	
EPA 6010B	Copper	mg/kg	105	104	100	0.5	20	W153064	04-Jan-12	
EPA 6010B	Iron	mg/kg	14100	13900	1000	1.1	20	W153064	04-Jan-12	
EPA 6010B	Manganese	mg/kg	139	137	100	1.4	20	W153064	04-Jan-12	
EPA 6010B	Nickel	mg/kg	106	105	100	0.6	20	W153064	04-Jan-12	
EPA 6010B	Vanadium	mg/kg	126	125	100	0.7	20	W153064	04-Jan-12	
EPA 6010B	Zinc	mg/kg	108	109	100	0.6	20	W153064	04-Jan-12	
EPA 7471A	Mercury	mg/kg	0.340	0.345	0.167	1.5	20	W153049	28-Dec-11	H3

Classical Chemistry Parameters

SW846 9012B	Cyanide (total)	mg/kg	3.94	4.01	4.00	1.8	20	W153035	28-Dec-11	
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Quality Control - POST DIGESTION SPIKE Data

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Total)

EPA 6020	Arsenic	mg/kg	3.66	1.04	2.50	105	75 - 125	W153005	05-Jan-12	D1
EPA 6020	Cadmium	mg/kg	2.62	<0.100	2.50	105	75 - 125	W153005	05-Jan-12	D1
EPA 6020	Lead	mg/kg	7.73	5.31	2.50	96.7	75 - 125	W153005	05-Jan-12	D1
EPA 6020	Selenium	mg/kg	3.57	0.857	2.50	108	75 - 125	W153005	05-Jan-12	D1
EPA 6020	Silver	mg/kg	2.57	<0.0500	2.50	101	75 - 125	W153005	05-Jan-12	D1
EPA 6020	Thallium	mg/kg	2.48	<0.1000	2.50	98.5	75 - 125	W153005	05-Jan-12	D1



Golder Associates (WA)
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Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0444**

Reported: 05-Jan-12 16:26

Notes and Definitions

D1	Sample required dilution due to matrix.
H3	Sample was received and analyzed past holding time.
M2	Matrix spike recovery was low, but the LCS recovery was acceptable.
M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to spike level. The LCS was acceptable.
LCS	Laboratory Control Sample (Blank Spike)
RPD	Relative Percent Difference
UDL	A result is less than the detection limit
R > 4S	% recovery not applicable, sample concentration more than four times greater than spike level
<RL	A result is less than the reporting limit
MRL	Method Reporting Limit
MDL	Method Detection Limit
N/A	Not Applicable



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Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0450**

Reported: 09-Jan-12 11:46

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Sampled By	Date Received
12162011SW025	W1L0450-01	Sediment	16-Dec-11 10:35	BT	21-Dec-2011

Solid samples are analyzed on an as-received, wet-weight basis, unless otherwise requested. Non-Detects are reported at the MDL.

Sample preparation is defined by the client as per their Data Quality Objectives.

This report supercedes any previous reports for this Work Order. The complete report includes pages for each sample, a full QC report, and a notes section.

The results presented in this report relate only to the samples, and meet all requirements of the NELAC Standards unless otherwise noted.

(Q6) SVL received the following containers outside of published EPA guidelines for preservation temperatures (0-6°C).

The guidelines do not pertain to nitric-preserved metals.

Default Cooler (Received Temperature: 9.8°C)

<u>Labnumber</u>	<u>Container</u>	<u>Client ID</u>	<u>Labnumber</u>	<u>Container</u>	<u>Client ID</u>
W1L0450-01 A	Bag, Ziploc	12162011SW025	W1L0450-01 B	Envelope, manila	12162011SW025

Case Narrative

The sediment sample on this work order has been sieved with a #230 mesh sieve.



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: **Suriname - Merian Gold 2011 / 113-93245**

Work Order: **W1L0450**

Reported: 09-Jan-12 11:46

Client Sample ID: **12162011SW025**

SVL Sample ID: **W1L0450-01 (Sediment)**

Sample Report Page 1 of 1

Sampled: 16-Dec-11 10:35

Received: 21-Dec-11

Sampled By: BT

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total)										
EPA 6020	Arsenic	0.952	mg/kg	0.300	0.060	5	W153005	KWH	01/05/12 10:33	D1
EPA 6020	Cadmium	< 0.100	mg/kg	0.100	0.018	5	W153005	KWH	01/05/12 10:33	D1
EPA 6020	Lead	2.31	mg/kg	0.100	0.0125	5	W153005	KWH	01/05/12 10:33	D1
EPA 6020	Selenium	0.658	mg/kg	0.300	0.175	5	W153005	KWH	01/05/12 10:33	D1
EPA 6020	Silver	< 0.0500	mg/kg	0.0500	0.0085	5	W153005	KWH	01/05/12 10:33	D1
EPA 6020	Thallium	< 0.100	mg/kg	0.100	0.0033	5	W153005	KWH	01/05/12 10:33	D1

Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Aluminum	3510	mg/kg	8.0	1.6		W153064	DT	01/04/12 11:32	
EPA 6010B	Chromium	24.8	mg/kg	0.60	0.05		W153064	DT	01/04/12 11:33	
EPA 6010B	Copper	10.4	mg/kg	1.00	0.21		W153064	DT	01/04/12 11:33	
EPA 6010B	Iron	5760	mg/kg	6.0	1.1		W153064	DT	01/04/12 11:32	
EPA 6010B	Manganese	9.07	mg/kg	0.40	0.04		W153064	DT	01/04/12 11:32	
EPA 6010B	Nickel	13.5	mg/kg	1.00	0.22		W153064	DT	01/04/12 11:33	
EPA 6010B	Vanadium	10.4	mg/kg	0.50	0.04		W153064	DT	01/04/12 11:33	
EPA 6010B	Zinc	7.67	mg/kg	1.00	0.09		W153064	DT	01/04/12 11:33	
EPA 7471A	Mercury	0.395	mg/kg	0.033	0.007		W201054	DJA	01/06/12 16:09	

Classical Chemistry Parameters

SM 4500-CN-I	Cyanide (WAD)	< 0.500	mg/kg	0.500	0.065		W153036	CFE	12/28/11 15:16	
SW846 9012B	Cyanide (total)	< 0.50	mg/kg	0.50	0.10		W153035	CFE	12/28/11 13:40	
SW-846 9213	Cyanide (free)	< 5.00	mg/kg	5.00	0.46		W153078	CFE	12/30/11 08:30	
USDA HB60(24)	Total Organic Carbon	6.34	%	0.0900	0.0180		W201046	SM	01/05/12 10:20	
USDA HB60(24)	Total Organic Matter	10.9	%	0.150	0.0310		W201046	SM	01/05/12 10:20	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245
Work Order: **W1L0450**
Reported: 09-Jan-12 11:46

Quality Control - BLANK Data

Method	Analyte	Units	Result	MDL	MRL	Batch ID	Analyzed	Notes
Metals (Total)								
EPA 6020	Arsenic	mg/kg	<0.300	0.060	0.300	W153005	05-Jan-12	D1
EPA 6020	Cadmium	mg/kg	<0.100	0.018	0.100	W153005	05-Jan-12	D1
EPA 6020	Lead	mg/kg	<0.100	0.0125	0.100	W153005	05-Jan-12	D1
EPA 6020	Selenium	mg/kg	<0.300	0.175	0.300	W153005	05-Jan-12	D1
EPA 6020	Silver	mg/kg	<0.0500	0.0085	0.0500	W153005	05-Jan-12	D1
EPA 6020	Thallium	mg/kg	<0.100	0.0033	0.100	W153005	05-Jan-12	D1

Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Aluminum	mg/kg	<8.0	1.6	8.0	W153064	04-Jan-12	
EPA 6010B	Chromium	mg/kg	<0.60	0.05	0.60	W153064	04-Jan-12	
EPA 6010B	Copper	mg/kg	<1.00	0.21	1.00	W153064	04-Jan-12	
EPA 6010B	Iron	mg/kg	<6.0	1.1	6.0	W153064	04-Jan-12	
EPA 6010B	Manganese	mg/kg	<0.40	0.04	0.40	W153064	04-Jan-12	
EPA 6010B	Nickel	mg/kg	<1.00	0.22	1.00	W153064	04-Jan-12	
EPA 6010B	Vanadium	mg/kg	<0.50	0.04	0.50	W153064	04-Jan-12	
EPA 6010B	Zinc	mg/kg	<1.00	0.09	1.00	W153064	04-Jan-12	
EPA 7471A	Mercury	mg/kg	<0.033	0.007	0.033	W201054	06-Jan-12	

Classical Chemistry Parameters

SM 4500-CN-I	Cyanide (WAD)	mg/kg	<0.500	0.065	0.500	W153036	28-Dec-11	
SW846 9012B	Cyanide (total)	mg/kg	<0.50	0.10	0.50	W153035	28-Dec-11	
SW-846 9213	Cyanide (free)	mg/kg	<1.00	0.09	1.00	W153078	30-Dec-11	
USDA HB60(24)	Total Organic Matter	%	<0.150	0.0310	0.150	W201046	05-Jan-12	
USDA HB60(24)	Total Organic Carbon	%	<0.0900	0.0180	0.0900	W201046	05-Jan-12	

Quality Control - LABORATORY CONTROL SAMPLE Data

Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
Metals (Total)									
EPA 6020	Arsenic	mg/kg	2.63	2.50	105	80 - 120	W153005	05-Jan-12	D1
EPA 6020	Cadmium	mg/kg	2.63	2.50	105	80 - 120	W153005	05-Jan-12	D1
EPA 6020	Lead	mg/kg	2.46	2.50	98.5	80 - 120	W153005	05-Jan-12	D1
EPA 6020	Selenium	mg/kg	2.73	2.50	109	80 - 120	W153005	05-Jan-12	D1
EPA 6020	Silver	mg/kg	2.58	2.50	103	80 - 120	W153005	05-Jan-12	D1
EPA 6020	Thallium	mg/kg	2.45	2.50	98.0	80 - 120	W153005	05-Jan-12	D1

Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Aluminum	mg/kg	95.8	100	95.8	80 - 120	W153064	04-Jan-12	
EPA 6010B	Chromium	mg/kg	91.7	100	91.7	80 - 120	W153064	04-Jan-12	
EPA 6010B	Copper	mg/kg	86.7	100	86.7	80 - 120	W153064	04-Jan-12	
EPA 6010B	Iron	mg/kg	994	1000	99.4	80 - 120	W153064	04-Jan-12	
EPA 6010B	Manganese	mg/kg	92.2	100	92.2	80 - 120	W153064	04-Jan-12	
EPA 6010B	Nickel	mg/kg	86.6	100	86.6	80 - 120	W153064	04-Jan-12	
EPA 6010B	Vanadium	mg/kg	93.2	100	93.2	80 - 120	W153064	04-Jan-12	
EPA 6010B	Zinc	mg/kg	86.5	100	86.5	80 - 120	W153064	04-Jan-12	
EPA 7471A	Mercury	mg/kg	0.813	0.833	97.6	80 - 120	W201054	06-Jan-12	

Classical Chemistry Parameters

SM 4500-CN-I	Cyanide (WAD)	mg/kg	1.55	1.50	103	80 - 120	W153036	28-Dec-11	
SW846 9012B	Cyanide (total)	mg/kg	9.60	9.60	100	80 - 120	W153035	28-Dec-11	
SW-846 9213	Cyanide (free)	mg/kg	10.4	10.0	104	85 - 115	W153078	30-Dec-11	
USDA HB60(24)	Total Organic Matter	%	0.518	0.464	112	80 - 120	W201046	05-Jan-12	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
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Project Name: Suriname - Merian Gold 2011 / 113-93245
Work Order: **W1L0450**
Reported: 09-Jan-12 11:46

Quality Control - LABORATORY CONTROL SAMPLE Data (Continued)

Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Classical Chemistry Parameters (Continued)

USDA HB60(24)	Total Organic Carbon	%	0.301	0.269	112	80 - 120	W201046	05-Jan-12	
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Quality Control - DUPLICATE Data

Method	Analyte	Units	Duplicate Result	Sample Result	RPD	RPD Limit	Batch ID	Analyzed	Notes
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Metals (Total)

EPA 6020	Arsenic	mg/kg	0.801	1.04	26.1	20	W153005	05-Jan-12	D1
EPA 6020	Cadmium	mg/kg	<0.100	<0.100	UDL	20	W153005	05-Jan-12	D1
EPA 6020	Lead	mg/kg	4.24	5.31	22.4	20	W153005	05-Jan-12	D1
EPA 6020	Selenium	mg/kg	0.850	0.857	0.9	20	W153005	05-Jan-12	D1
EPA 6020	Silver	mg/kg	<0.0500	<0.0500	<RL	20	W153005	05-Jan-12	D1
EPA 6020	Thallium	mg/kg	<0.100	<0.100	<RL	20	W153005	05-Jan-12	D1

Classical Chemistry Parameters

SM 4500-CN-1	Cyanide (WAD)	mg/kg	<0.500	<0.500	UDL	20	W153036	28-Dec-11	
SW846 9012B	Cyanide (total)	mg/kg	<0.50	<0.50	UDL	20	W153035	28-Dec-11	
SW-846 9213	Cyanide (free)	mg/kg	<1.00	<1.00	<RL	20	W153078	30-Dec-11	
USDA HB60(24)	Total Organic Matter	%	0.252	0.272	7.4	20	W201046	05-Jan-12	
USDA HB60(24)	Total Organic Carbon	%	0.146	0.158	7.4	20	W201046	05-Jan-12	

Quality Control - MATRIX SPIKE Data

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Total)

EPA 6020	Arsenic	mg/kg	2.52	1.04	2.50	59.0	75 - 125	W153005	05-Jan-12	D1,M2
EPA 6020	Cadmium	mg/kg	2.63	<0.100	2.50	105	75 - 125	W153005	05-Jan-12	D1
EPA 6020	Lead	mg/kg	7.41	5.31	2.50	83.9	75 - 125	W153005	05-Jan-12	D1
EPA 6020	Selenium	mg/kg	2.59	0.857	2.50	69.2	75 - 125	W153005	05-Jan-12	D1,M2
EPA 6020	Silver	mg/kg	2.60	<0.0500	2.50	102	75 - 125	W153005	05-Jan-12	D1
EPA 6020	Thallium	mg/kg	2.39	<0.100	2.50	94.9	75 - 125	W153005	05-Jan-12	D1

Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Aluminum	mg/kg	15600	4370	100	R > 4S	75 - 125	W153064	04-Jan-12	M3
EPA 6010B	Chromium	mg/kg	132	18.7	100	114	75 - 125	W153064	04-Jan-12	
EPA 6010B	Copper	mg/kg	104	5.04	100	99.4	75 - 125	W153064	04-Jan-12	
EPA 6010B	Iron	mg/kg	13900	12600	1000	R > 4S	75 - 125	W153064	04-Jan-12	M3
EPA 6010B	Manganese	mg/kg	137	36.4	100	101	75 - 125	W153064	04-Jan-12	
EPA 6010B	Nickel	mg/kg	105	2.23	100	103	75 - 125	W153064	04-Jan-12	
EPA 6010B	Vanadium	mg/kg	125	16.9	100	108	75 - 125	W153064	04-Jan-12	
EPA 6010B	Zinc	mg/kg	109	9.36	100	99.7	75 - 125	W153064	04-Jan-12	
EPA 7471A	Mercury	mg/kg	3630	2370	0.167	R > 4S	75 - 125	W201054	06-Jan-12	D2,M3

Classical Chemistry Parameters

SM 4500-CN-1	Cyanide (WAD)	mg/kg	4.15	<0.500	4.00	104	75 - 125	W153036	28-Dec-11	
SM 4500-CN-1	Cyanide (WAD)	mg/kg	3.90	<0.500	4.00	97.5	75 - 125	W153036	28-Dec-11	
SW846 9012B	Cyanide (total)	mg/kg	4.01	<0.50	4.00	100	90 - 110	W153035	28-Dec-11	
SW846 9012B	Cyanide (total)	mg/kg	3.94	<0.50	4.00	95.0	90 - 110	W153035	28-Dec-11	
SW-846 9213	Cyanide (free)	mg/kg	9.42	<1.00	10.0	92.9	85 - 115	W153078	30-Dec-11	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268



Golder Associates (WA)
 18300 NE Union Hill Road, Suite 200
 Redmond, WA 98052-3333

Project Name: Suriname - Merian Gold 2011 / 113-93245
 Work Order: **W1L0450**
 Reported: 09-Jan-12 11:46

Quality Control - MATRIX SPIKE Data (Continued)

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Classical Chemistry Parameters (Continued)

SW-846 9213	Cyanide (free)	mg/kg	10.5	<1.00	10.0	103	85 - 115	W153078	30-Dec-11	
USDA HB60(24)	Total Organic Matter	%	3.34	0.272	2.92	105	75 - 125	W201046	05-Jan-12	
USDA HB60(24)	Total Organic Carbon	%	1.94	0.158	1.69	105	75 - 125	W201046	05-Jan-12	

Quality Control - MATRIX SPIKE DUPLICATE Data

Method	Analyte	Units	MSD Result	Spike Result	Spike Level	RPD	RPD Limit	Batch ID	Analyzed	Notes
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Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Aluminum	mg/kg	15400	15600	100	0.9	20	W153064	04-Jan-12	
EPA 6010B	Chromium	mg/kg	133	132	100	0.6	20	W153064	04-Jan-12	
EPA 6010B	Copper	mg/kg	105	104	100	0.5	20	W153064	04-Jan-12	
EPA 6010B	Iron	mg/kg	14100	13900	1000	1.1	20	W153064	04-Jan-12	
EPA 6010B	Manganese	mg/kg	139	137	100	1.4	20	W153064	04-Jan-12	
EPA 6010B	Nickel	mg/kg	106	105	100	0.6	20	W153064	04-Jan-12	
EPA 6010B	Vanadium	mg/kg	126	125	100	0.7	20	W153064	04-Jan-12	
EPA 6010B	Zinc	mg/kg	108	109	100	0.6	20	W153064	04-Jan-12	
EPA 7471A	Mercury	mg/kg	3480	3630	0.167	4.2	20	W201054	06-Jan-12	D2,M3

Classical Chemistry Parameters

SW846 9012B	Cyanide (total)	mg/kg	3.94	4.01	4.00	1.8	20	W153035	28-Dec-11	
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Quality Control - POST DIGESTION SPIKE Data

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Total)

EPA 6020	Arsenic	mg/kg	3.66	1.04	2.50	105	75 - 125	W153005	05-Jan-12	D1
EPA 6020	Cadmium	mg/kg	2.62	<0.100	2.50	105	75 - 125	W153005	05-Jan-12	D1
EPA 6020	Lead	mg/kg	7.73	5.31	2.50	96.7	75 - 125	W153005	05-Jan-12	D1
EPA 6020	Selenium	mg/kg	3.57	0.857	2.50	108	75 - 125	W153005	05-Jan-12	D1
EPA 6020	Silver	mg/kg	2.57	<0.0500	2.50	101	75 - 125	W153005	05-Jan-12	D1
EPA 6020	Thallium	mg/kg	2.48	<0.1000	2.50	98.5	75 - 125	W153005	05-Jan-12	D1



Golder Associates (WA)
18300 NE Union Hill Road, Suite 200
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Project Name: Suriname - Merian Gold 2011 / 113-93245

Work Order: **W1L0450**

Reported: 09-Jan-12 11:46

Notes and Definitions

D1	Sample required dilution due to matrix.
D2	Sample required dilution due to high concentration of target analyte.
M2	Matrix spike recovery was low, but the LCS recovery was acceptable.
M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to spike level. The LCS was acceptable.
LCS	Laboratory Control Sample (Blank Spike)
RPD	Relative Percent Difference
UDL	A result is less than the detection limit
R > 4S	% recovery not applicable, sample concentration more than four times greater than spike level
<RL	A result is less than the reporting limit
MRL	Method Reporting Limit
MDL	Method Detection Limit
N/A	Not Applicable

APPENDIX B
GOLDER ASSOCIATES INC. DATA VALIDATION REPORTS



TECHNICAL MEMORANDUM

Date: 20 January 2012

Project No.: 113-93245

To: File

Company:

From: Jeremy Clark

cc:

Email:

RE: DATA VALIDATION FOR SVL DATA PACKAGE W1K0622

Following is a summary of Golder's data validation review of SVL data package W1K0622 for fifteen surface water samples:

- 11212011SW011 collected 21 November 2011
- 11212011SW012 collected 21 November 2011
- 11212011SW013 collected 21 November 2011
- 11222011SW015 collected 22 November 2011
- 11242011SW017 collected 24 November 2011
- 11242011SW018 collected 24 November 2011
- 11242011SW019 collected 24 November 2011
- 11242011SW119 collected 24 November 2011
- 11252011SW020 collected 25 November 2011
- 11252011SW120 collected 25 November 2011
- 11262011SW021 collected 26 November 2011
- 11262011SW221 collected 26 November 2011
- 11262011SW022 collected 26 November 2011
- 11262011SW023 collected 26 November 2011
- 11262011SW024 collected 26 November 2011

The following data validation elements were described in the surface and ground water sampling SAP:

- Assessment of Completeness: PASS

COC Requested Analysis for GW	Analyzed
Total Metals	Yes
Dissolved Metals	Yes
NO2/NO3/Ammonia/Phos./COD	Yes
Anions/Alkalinity/TDS/TSS/pH	Yes
Cyanide (WAD, Free, Total)	Yes
TOC	Yes
Oil and Grease	Yes (ANATEK labs)



■ Assessment of Holding Times:

Parameter	Analysis Method	Holding Time (days)	Analysis (days post collection)	Note
TDS/TSS	SM 25470 C/D	7	5-10	Pass, Fail for 4 of the samples
Alkalinity	SM 2320B/2310B	14	5-10	Pass
Hardness	SM 2340B	28	16-21	Pass
Mercury (total)	245.1	28	13-18	Pass
Metals (total)	200.7	180	16-21	Pass
Metals (dissolved)	200.7	180	16-21	Pass
Metals (total), Sb, As, Se, Tl, U	200.8	180	10-15	Pass
Metals (dissolved) , Sb, As, Se, Tl	200.8	180	11-16	Pass
Cyanide (WAD/free/total)	SM 4500/ASTM D7237/ EPA 335.4	14	6-10	Pass
Anions (Cl, F, SO ₄)	300.0	28	10-15	Pass
Ammonia, Nitrate/Nitrite	350/1, 353.2	28	10-17	Pass
Phosphorus, Total	SM 4500-P-E	28	9-14	Pass
Specific Conductance	120.1	28	9-14	Pass
Oil and Grease (Hexane extractable material)	1664A	28	6-11	Pass
Turbidity	180.1	2	5-10	Fail
Chemical Oxygen Demand (COD)	410.4	28	10-15	Pass
pH	SM 4500 H B	<1	5-10	Fail
Total Organic Carbon (TOC)	SM 5310B	28	11-16	Pass

- Field Duplicate Sample Evaluation: There were a few analytes with an RPD greater than 20% for these water samples. For samples 11242011-SW019 and -SW119, the duplicate analysis of iron, chemical oxygen demand, nitrate, TDS and TSP had an RPD > 20%. For samples 11252011SW020 and -SW121, the duplicate analysis of phosphorus and ammonia had an RPD > 20%.

Analyte	11242011-SW019	11242011-SW119	RPD		11252011-SW020	11252011-SW120	RPD	Note
Dissolved								
Aluminum	-0.08	-0.08	0%		-0.08	-0.08	0%	Pass
Antimony	-0.003	-0.003	0%		-0.003	-0.003	0%	Pass
Arsenic	-0.003	-0.003	0%		-0.003	-0.003	0%	Pass
Barium	0.0045	0.0045	0%		0.0036	0.0037	3%	Pass
Beryllium	-0.002	-0.002	0%		-0.002	-0.002	0%	Pass
Boron	-0.04	-0.04	0%		-0.04	-0.04	0%	Pass

Analyte	11242011-SW019	11242011-SW119	RPD		11252011-SW020	11252011-SW120	RPD	Note
Cadmium	-0.002	-0.002	0%		-0.002	-0.002	0%	Pass
Calcium	1.72	1.74	1%		0.823	0.842	2%	Pass
Chromium	-0.006	-0.006	0%		-0.006	-0.006	0%	Pass
Cobalt	-0.006	-0.006	0%		-0.006	-0.006	0%	Pass
Copper	-0.01	-0.01	0%		-0.01	-0.01	0%	Pass
Iron	0.636	0.779	20%		0.672	0.724	7%	Fail
Lead	-0.0075	-0.0075	0%		-0.0075	-0.0075	0%	Pass
Magnesium	1.76	1.78	1%		1.11	1.11	0%	Pass
Manganese	0.0409	0.041	0%		0.0321	0.0294	9%	Pass
Molybdenum	-0.008	-0.008	0%		-0.008	-0.008	0%	Pass
Nickel	-0.01	-0.01	0%		-0.01	-0.01	0%	Pass
Potassium	1.17	1.17	0%		0.7	0.71	1%	Pass
Selenium	-0.003	-0.003	0%		-0.003	-0.003	0%	Pass
Silicon	3.13	3.17	1%		3.76	3.75	0%	Pass
Silver	-0.005	-0.005	0%		-0.005	-0.005	0%	Pass
Sodium	4.35	4.39	1%		3.23	3.25	1%	Pass
Thallium	-0.001	-0.001	0%		-0.001	-0.001	0%	Pass
Titanium	-0.005	-0.005	0%		-0.005	-0.005	0%	Pass
Vanadium	-0.005	-0.005	0%		-0.005	-0.005	0%	Pass
Zinc	-0.01	-0.01	0%		-0.01	-0.01	0%	Pass
Total								
Cyanide (total)	-0.01	-0.01	0%		-0.01	-0.01	0%	Pass
Mercury	-0.0002	-0.0002	0%		-0.0002	-0.0002	0%	Pass
Phosphorus	0.037	0.042	13%		0.112	0.091	21%	Fail
Total Recoverable								
Aluminum	1.56	1.62	4%		4.79	4.91	2%	Pass
Antimony	-0.003	-0.003	0%		-0.003	-0.003	0%	Pass
Arsenic	-0.003	-0.003	0%		-0.003	-0.003	0%	Pass
Barium	0.0096	0.0095	1%		0.0165	0.0167	1%	Pass
Beryllium	-0.002	-0.002	0%		-0.002	-0.002	0%	Pass
Boron	-0.04	-0.04	0%		-0.04	-0.04	0%	Pass
Cadmium	-0.002	-0.002	0%		-0.002	-0.002	0%	Pass
Calcium	1.77	1.77	0%		0.922	0.922	0%	Pass
Chromium	0.0069	0.0075	8%		0.0193	0.0198	3%	Pass
Cobalt	-0.006	-0.006	0%		-0.006	-0.006	0%	Pass
Copper	-0.01	-0.01	0%		-0.01	-0.01	0%	Pass
Iron	8.02	8.46	5%		10.1	10.3	2%	Pass

Analyte	11242011-SW019	11242011-SW119	RPD		11252011-SW020	11252011-SW120	RPD	Note
Lead	-0.0075	-0.0075	0%		-0.0075	-0.0075	0%	Pass
Magnesium	1.99	1.95	2%		1.43	1.43	0%	Pass
Manganese	0.0551	0.0543	1%		0.051	0.0515	1%	Pass
Molybdenum	-0.008	-0.008	0%		-0.008	-0.008	0%	Pass
Nickel	-0.01	-0.01	0%		-0.01	-0.01	0%	Pass
Potassium	1.23	1.22	1%		0.86	0.85	1%	Pass
Selenium	-0.003	-0.003	0%		-0.003	-0.003	0%	Pass
Silicon	4.61	4.57	1%		7.76	7.87	1%	Pass
Silver	-0.005	-0.005	0%		-0.005	-0.005	0%	Pass
Sodium	4.38	4.35	1%		3.2	3.22	1%	Pass
Thallium	-0.001	-0.001	0%		-0.001	-0.001	0%	Pass
Titanium	0.0151	0.018	18%		0.0158	0.0156	1%	Pass
Uranium	-0.001	-0.001	0%		-0.001	-0.001	0%	Pass
Vanadium	0.006	0.0064	6%		0.0128	0.0132	3%	Pass
Zinc	-0.01	-0.01	0%		-0.01	-0.01	0%	Pass
Ammonia as N	0.393	0.408	4%		0.103	0.166	47%	Fail
Bicarbonate	11.4	11.6	2%		5.8	5.8	0%	Pass
Carbonate	-1	-1	0%		-1	-1	0%	Pass
Chemical Oxygen Demand	21.5	26.3	20%		25.1	24	4%	Fail
Chloride	5.57	5.65	1%		4.57	4.5	2%	Pass
Cyanide (free)	-0.005	-0.005	0%		-0.005	-0.005	0%	Pass
Cyanide (WAD)	-0.01	-0.01	0%		-0.01	-0.01	0%	Pass
Fluoride	-0.1	-0.1	0%		-0.1	-0.1	0%	Pass
Hardness (as CaCO3)	12.6	12.5	1%		8.2	8.19	0%	Pass
Hexane extractable material (HEM)	-1	-1	0%		-1	-1	0%	Pass
Nitrate/Nitrite as N	0.161	0.215	29%		0.38	0.43	12%	Fail
pH	6.72	6.76	1%		6.32	6.4	1%	Pass
Specific conductance	53.6	53.9	1%		32.7	32.6	0%	Pass
Sulfate as SO4	2.87	2.77	4%		0.94	0.99	5%	Pass
Total Alkalinity	11.4	11.6	2%		5.8	5.8	0%	Pass
Total Diss. Solids	94	73	25%		86	95	10%	Fail
Total Organic Carbon	6.61	6.85	4%		6.48	7.92	20%	Pass
Total Susp. Solids	34	70	69%		201	189	6%	Fail
Turbidity	168	174	4%		336	408	19%	Pass

- Charge Balance Errors: C/A balance is less than 10% for all GW samples – PASS --- except 11242011SW017 (20%) FAIL
- Blank Samples: Samples 11262011SW221 and 11262011SW024 (cyanide only) were field blanks. There were no detections of cyanide in sample 11262011SW024. The following table shows detections in sample 11262011SW221 compared with the Reporting Limit (RL). The analytes calcium, copper, zinc, and chloride were found at concentrations greater than 10 times the reporting limit in the blank sample and should be qualified in the dataset.

Analyte	Result (mg/L)	RL (mg/L)	ratio (result/RL)	Note
Mercury (total)	0.00038	0.00020	1.9	<10x RL - Pass
Barium (total)	0.0129	0.0020	6.45	<10x RL - Pass
Barium (dissolved)	0.0127	0.0020	6.35	<10x RL - Pass
Calcium (total)	0.970	0.040	24.25	Fail
Calcium (dissolved)	1.03	0.040	25.75	Fail
Chromium (total)	0.0066	0.0060	1.1	<10x RL - Pass
Copper (total)	0.118	0.010	11.8	Fail
Copper (dissolved)	0.136	0.010	13.6	Fail
Magnesium (total)	0.213	0.060	3.55	<10x RL - Pass
Magnesium (dissolved)	0.213	0.060	3.55	<10x RL - Pass
Manganese (total)	0.0056	0.0040	1.40	<10x RL - Pass
Manganese (dissolved)	0.0071	0.0040	1.775	<10x RL - Pass
Potassium (total)	0.53	0.50	1.06	<10x RL - Pass
Potassium (dissolved)	0.55	0.50	1.10	<10x RL - Pass
Silicon (total)	0.25	0.08	3.125	<10x RL - Pass
Silicon (dissolved)	0.20	0.08	2.50	<10x RL - Pass
Sodium (total)	1.23	0.50	2.46	<10x RL - Pass
Sodium (dissolved)	1.38	0.5	2.76	<10x RL - Pass
Zinc (total)	0.427	0.010	42.7	Fail
Zinc (dissolved)	0.447	0.010	44.7	Fail
Hardness (total)	3.3	0.347	9.51	<10x RL - Pass
Turbidity	0.112 (NTU)	0.100 (NTU)	1.12	<10x RL - Pass
Nitrate/Nitrite as N	0.450	0.050	9.00	<10x RL - Pass
Bicarbonate	2.5	1.0	2.50	<10x RL - Pass
Total Alkalinity	2.5	1.0	2.50	<10x RL - Pass
TDS	12	10	1.20	<10x RL - Pass
pH	6.19 (pH units)	NA	NA	NA
Chloride	2.70	0.20	13.5	Fail
Sulfate as SO4	0.75	0.30	2.50	<10x RL - Pass

- Laboratory vs. Field Analyses: Field and Lab pH and conductivity measurements were close on all samples except the pH on 11212011SW013 and the conductivity of SW017 and SW120. The lab calculated TDS were off on all samples except the SW221 (field blank). The notes on the analytical report state that TDS was difficult to sample for this set of samples.

sample ID	Field pH	Lab pH	Ratio	Field Cond.	Lab Cond.	Ratio	Lab Meas. TDS	Lab Calc. TDS	Ratio	Note
11212011SW011	6.53	6.6	0.99	62.1	59	1.05	57	36	1.56	Pass
11212011SW012	6.39	6.6	0.97	39.5	37.4	1.06	47	27	1.76	Pass
11212011SW013	7.89	6.54	1.21	35.5	34	1.04	47	24	1.93	Fail
11222011SW015	NA	6.16	NA	NA	32.6	NA	420-660	46	9.10	Fail
11242011SW017	5.96	5.76	1.03	27.2	36.1	0.75	84	55	1.53	Fail
11242011SW018	6.14	6.5	0.94	41.7	40.3	1.03	80	33	2.41	Pass
11242011SW019	6.29	6.72	0.94	55.5	53.6	1.04	94	36	2.64	Pass
11242011SW119	6.29	6.76	0.93	55.5	53.9	1.03	73	36	2.03	Pass
11252011SW020	6.38	6.32	1.01	33.8	32.7	1.03	86	32	2.65	Pass
11252011SW120	6.38	6.4	1.00	33.8	23.6	1.43	95	33	2.9	Pass
11262011SW021	6.09	5.89	1.03	24.52	23.5	1.04	83	28	2.98	Pass
11262011SW221	NA	6.19	NA	NA	18.7	NA	12	11	1.13	Pass
11262011SW022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
11262011SW023	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
11262011SW024	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

All Field Sample data copied from Field Forms:

Sample #	Water Temp (°C)	Conductivity (µS/cm)	Turbidity (NTU)	pH	Dissolved Oxygen (mg/L)	ORP (mV)
11212011SW011	34.6	62.1	46.4	6.53	75.3	344.7
11212011SW012	32.9	39.5	27.6	6.39	84.9	379.1
11212011SW013	32.4	35.5	24	7.89	93.1	374.9
11222011SW015	NM	NM	NM	NM	NM	NM
11242011SW017	28.6	27.2	NM	5.96	87.8	374.8
11242011SW018	25	41.7	NM	6.14	67.3	408.3
11242011SW019	28.6	55.5	19.3	6.29	81.7	433.7
11242011SW119	duplicate					
11252011SW020	27.3	33.8	444	6.38	75.8	466.6
11252011SW120	duplicate					
11262011SW221	blank					
11262011SW021	24.8	24.52	282	6.09	67.7	481.4
11262011SW022	no field form					
11262011SW023	no field form					
11262011SW024	blank					

NM = Not measured/recorded on field forms

- Comparison of Total and Dissolved Metal Analyses: Generally, given some measurement uncertainty, an RPD of greater than 20% will be considered unacceptable when dissolved concentrations are greater than total. Following is a list of samples and analytes with an RPD where the dissolved concentration was greater than total concentration of an analyte. Only manganese in sample 11262011SW221 (field blank) had an RPD > 20%

Analyte	Dissolved	Total Recoverable	RPD	Notes
W1K0622-01				
Calcium	1.74	1.66	5%	Pass
Potassium	1.2	1.07	11%	Pass
Sodium	3.5	3.36	4%	Pass
W1K0622-02				
Calcium	1.22	1.13	8%	Pass
Magnesium	1.2	1.19	1%	Pass
Sodium	2.86	2.76	4%	Pass
W1K0622-03				
Calcium	1.36	1.3	5%	Pass
Sodium	2.68	2.62	2%	Pass
W1K0622-05				
Sodium	4.16	4.15	0%	Pass
W1K0622-06				
Calcium	1.17	1.14	3%	Pass
Sodium	3.81	3.66	4%	Pass
W1K0622-08				
Sodium	4.39	4.35	1%	Pass
W1K0622-09				
Sodium	3.23	3.2	1%	Pass
W1K0622-10				
Sodium	3.25	3.22	1%	Pass
W1K0622-11				
Sodium	2.64	2.62	1%	Pass
W1K0622-12				
Calcium	1.03	0.97	6%	Pass
Copper	0.136	0.118	14%	Pass
Manganese	0.0071	0.0056	24%	Fail
Potassium	0.55	0.53	4%	Pass
Sodium	1.38	1.23	11%	Pass
Zinc	0.447	0.427	5%	Pass

- Inter-laboratory Comparison: results from University of Surname laboratory have not yet been received for comparison of orthophosphate, TDS, and TSS

- Laboratory Follow-up: no follow-up was necessary from the validation of this data package from SVL

Summary:

	11212011SW011	11212011SW012	11212011SW013	11222011SW015	11242011SW017	11242011SW018	11242011SW019	11242011SW119	11252011SW020	11252011SW120	11262011SW021	11262011SW221	11262011SW222	11262011SW223	11262011SW224
Assessment of Completeness	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Assessment of Holding Times ¹	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Field Duplicate Sample Evaluation ²	NA	NA	NA	NA	NA	NA	○	○	○	○	NA	NA	NA	NA	NA
Charge Balance Errors ³	●	●	●	●	○	●	●	●	●	●	●	●	NA	NA	NA
Blank samples ⁴	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	○	NA	NA	●
Laboratory vs. Field Analyses ⁵	●	●	○	○	○	●	●	●	●	○	●	●	NA	NA	NA
Comparison of Total and Dissolved ⁶	●	●	●	●	●	●	●	●	●	●	●	○	NA	NA	NA
Inter-Laboratory Comparison	X	X	X	X	X	X	X	X	X	X	X	X	NA	NA	NA

● = data OK, ○ = minor issue, see note, X = could not evaluate, NA = not applicable

Notes:

- 1 - All samples of turbidity and pH were analyzed past holding times. The following samples for TDS/TSS were analyzed past holding time: 11212011SW011, 11212011SW012, 11212011SW013, 11222011SW015
- 2 - For samples 11242011-SW019 and –SW119, the duplicate analysis of iron, chemical oxygen demand, nitrate, TDS and TSP had an RPD > 20%. For samples 11252011SW020 and –SW121, the duplicate analysis of phosphorus and ammonia had an RPD > 20%.
- 3 - The charge balance error was 20% (above the cutoff of 10%)
- 4 - The analytes calcium, copper, zinc, and chloride were found at concentrations greater than 10 times the reporting limit in the blank sample
- 5 - The pH on 11212011SW013 and the conductivity of SW017 and SW120 were not close. The lab calculated TDS were off on all samples except the SW221 (field blank). The notes on the analytical report state that TDS was difficult to sample for this set of samples.
- 6 - Only manganese in sample 11262011SW221 (field blank) had an RPD > 20%

Date: 28 January 2012

Project No.: 113-93245

To: File

Company:
From: Jeremy Clark

cc:
Email:
RE: DATA VALIDATION FOR SVL DATA PACKAGE W1L0081

Following is a summary of Golder's data validation review of SVL data package W1L0081 for 16 surface water samples analyzed for chlorophyll:

- 11182011SW004 collected 18 November 2011
- 11202011SW006 collected 20 November 2011
- 11202011SW007 collected 20 November 2011
- 11202011SW008 collected 20 November 2011
- 11212011SW011 collected 21 November 2011
- 11212011SW012 collected 21 November 2011
- 11212011SW013 collected 21 November 2011
- 11222011SW015 collected 22 November 2011
- 11242011SW017 collected 24 November 2011
- 11242011SW018 collected 24 November 2011
- 11242011SW019 collected 24 November 2011
- 11242011SW119 collected 24 November 2011
- 11252011SW020 collected 25 November 2011
- 11252011SW120 collected 25 November 2011
- 11262011SW021 collected 26 November 2011
- 11262011SW221 collected 26 November 2011

The following data validation elements were described in the sampling SAP:

- Assessment of Completeness: PASS

COC Requested Analysis for SW	Analyzed
Chlorophyll	Yes
ALSO: pheophyton	Yes (not requested on COC)



- Assessment of Holding Times: samples were frozen in the field and arrived frozen at the lab.

Parameter	Analysis Method	Holding Time (days)	Analysis (days post collection)	Note
Chlorophyll	SM 10200H	Immediate if thawed	17-20	Fail – however, arrived frozen

- Field Duplicate Sample Evaluation: Both field duplicates (11242011SW019 and SW119; 11252011SW020 and SW120) had no detectable concentrations of either analyte - PASS
- Charge Balance Errors: Not applicable
- Blank Samples: There were no detections of either analyte in the field blank (11262011SW221).
- Laboratory vs. Field Analyses: Not Applicable
- Comparison of Total and Dissolved Metal Analyses: Not Applicable
- Inter-laboratory Comparison: Not Applicable
- Laboratory Follow-up: no follow-up was necessary from the validation of this data package from SVL

Summary:

	11182011SW004	11202011SW006	11202011SW007	11202011SW008	11212011SW011	11212011SW012	11212011SW013	11222011SW015	11242011SW017	11242011SW018	11242011SW019	11242011SW119	11252011SW020	11252011SW120	11262011SW021	11262011SW221
Assessment of Completeness	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Assessment of Holding Times ¹	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Field Duplicate Sample Evaluation	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	●	●	●	●	NA	NA
Charge Balance Errors	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Blank samples	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	●
Laboratory vs. Field Analyses	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Comparison of Total and Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inter-Laboratory Comparison	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

● = data OK, ○ = minor issue, see note, X = could not evaluate, NA = not applicable

Notes:

1 – Samples were filtered and frozen in the field, and arrived frozen to the lab.



TECHNICAL MEMORANDUM

Date: 30 January 2012

Project No.: 113-93245

To: File

Company:

From: Jeremy Clark

cc:

Email:

RE: DATA VALIDATION FOR SVL DATA PACKAGE W1K0456

Following is a summary of Golder's data validation review of SVL data package W1K0456 for seven groundwater samples and one surface water sample:

- 10272011GW001 collected 27 October 2011
- 10282011GW001 collected 28 October 2011
- 10292011GW001 collected 29 October 2011
- 10302011GW001 collected 30 October 2011
- 10302011GW002 collected 30 October 2011
- 10302011GW003 collected 30 October 2011
- 10312011GW001 collected 31 October 2011
- 10312011SW001 collected 31 October 2011

The following data validation elements were described in the surface and ground water sampling SAP:

- Assessment of Completeness: SW only requested TSS, analyzed for TSS, TDS, Anions and Alkalinity

COC Requested Analysis for GW	Analyzed
Total Metals	Yes
Dissolved Metals	Yes
NO2/NO3/Ammonia/Phos.	Yes
Anions/Alkalinity	Yes
Cyanide (WAD, Free, Total)	Yes
	Also, TDS/TSS
COC Requested Analysis for SW	Analyzed
TSS	Yes (also TDS, Anions/Alkalinity)

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■ Assessment of Holding Times:

Parameter	Analysis Method	Holding Time (days)	Analysis (days post collection)	Note
TDS/TSS	SM 25470 C/D	7	21-25	Fail
Alkalinity	SM 2320B/2310B	14	23-32	Fail
Hardness	SM 2340B	28	35-39	Fail
Mercury (total)	245.1	28	23-36	Pass, Fail for 10302 011G W003
Metals (total)	200.7	180	36-40	Pass
Metals (dissolved)	200.7	180	35-39	Pass
Metals (total), Sb, As, Se, Tl, U	200.8	180	36-40	Pass
Metals (dissolved) , Sb, As, Se, Tl	200.8	180	35-39	Pass
Cyanide (WAD/free/total)	SM 4500/ASTM D7237/ EPA 335.4	14	21-25	Fail
Anions (Cl, F, SO ₄)	300.0	28	22-26	Pass
Ammonia, Nitrate/Nitrite	350/1, 353.2	28	21-27	Pass
Phosphorus, Total	SM 4500-P-E	28	23-27	Pass

- Field Duplicate Sample Evaluation: No field duplicates collected – COULD NOT BE EVALUATED
- Charge Balance Errors: C/A balance is less than 10% for all GW samples - PASS
- Blank Samples: There were no detected concentrations of any analytes in the sample Blank - PASS
- Laboratory vs. Field Analyses: Laboratory analyses of pH or conductivity, were not reported. The ratios of the lab measured versus calculated TDS were acceptable for GW samples **except** 10272011GW001 and 10282011GW001. Following is a table of field measurements for these samples.

Analyte	Lab Value	Field Value	RPD (%)	Note
pH	not reported	5.05-6.69	---	Not evaluated
Conductivity	not reported	45-256	---	

Sample #	Lab measured TDS	Lab calculated TDS	Ratio TDS	Note
10292011GW001	156	165	0.95	Pass
10302011GW001	181	167	1.08	Pass
10302011GW002	211	222	0.95	Pass
10302011GW003	231	274	0.84	Pass
10312011GW001	180	167	1.08	Pass
10272011GW001	99	55	1.81	Fail
10282011GW001	71	56	1.27	Fail

Well Number	Sample Number	pH (s.u.)	Conductivity ($\mu\text{S}/\text{cm}$)	Temp. ($^{\circ}\text{C}$)	DO (% sat.)	Turbidity (NTU)	Estimated Production (gpm)
TSF MW-1	10302011GW001	6.28	145	26.8	84	13	6
TSF TW-2 (original well)	10282011GW001	5.05	37	27.2	72	35	<1
TSF TW-2R	11012011GW001	5.21	45	25.4	82	3.9	10.5
TSF TW-3	10272011GW001	5.67	55	28.8	73	159	41004
TSF TW-5	10312011GW001	6.53	197	28.2	67	12	0.2
TSF TW-7	10302011GW002	6.48	239	26.1	66	14.9	12
M2-PZ-1 TW-1	10292011GW001	6.69	256	25.7	25	20.6	
MA-PZ-1 TW-1	10302011GW003	6.54	244	26.1	13	23.3	

- Comparison of Total and Dissolved Metal Analyses: Generally, given some measurement uncertainty, an RPD of greater than 20% will be considered unacceptable. Samples 10272011GW001, 10282011GW001, 10292011GW001, 10302011GW001, 10302011GW002 did not have any analytes where the dissolved concentration was 20% greater than the total. Following is a list of samples and analytes with an RPD > 20% where the dissolved concentration was greater than total concentration of an analyte:

Sample / Analyte	Dissolved (mg/L)	Total Recoverable (mg/L)	RPD (%)
10302011GW003			
Manganese	0.675	0.529	24%
10312011GW001			
Titanium	0.007	ND (0.005)	> 33%
Zinc	0.751	0.529	35%

- Inter-laboratory Comparison: results from University of Surname laboratory have not yet been received for comparison of orthophosphate, TDS, and TSS
- Laboratory Follow-up: no follow-up was necessary from the validation of this data package from SVL

Summary:

	10272011GW001	10282011GW001	10292011GW001	10302011GW001	10302011GW002	10302011GW003	10312011GW001	10312011SW001
Assessment of Completeness	●	●	●	●	●	●	●	●
Assessment of Holding Times ¹	○	○	○	○	○	○	○	○
Field Duplicate Sample Evaluation	NA	NA	NA	NA	NA	NA	NA	NA
Charge Balance Errors	●	●	●	●	●	●	●	NA
Blank samples	NA	NA	NA	NA	NA	NA	NA	NA
Laboratory vs. Field Analyses ²	○	○	●	●	●	●	●	NA
Comparison of Total and Dissolved ³	●	●	●	●	●	○	○	NA
Inter-Laboratory Comparison	X	X	X	X	X	X	X	X

● = data OK, ○ = minor issue, see note, X = could not evaluate, NA = not applicable

Notes:

1 – the following analytes were analyzed past recommended holding times for all GW samples: TDS/TSS, Alkalinity, Hardness, Mercury for 10302011GW003, Cyanide (all fractions). For SW, TDS/TSS and Alkalinity were past holding times.

2 – Laboratory measured vs. calculated TDS was off for these samples (measured > calculated)

3 – Manganese was 24% higher in the dissolved fraction than total for sample 10302011GW003; and for sample 10312011GW001, titanium was >33% and zinc was 35% higher in the dissolved fraction compared with total



TECHNICAL MEMORANDUM

Date: 30 January 2011

Project No.: 113-93245

To: File

Company:

From: Jeremy Clark

cc:

Email:

RE: DATA VALIDATION FOR SVL DATA PACKAGE W1K0270

Following is a summary of Golder's data validation review of SVL data package W1K0270 for groundwater sample 11012011-GW-001 collected 1 November 2011 and analyzed between 14 November and 6 December 2011.

The following data validation elements described in the surface and ground water sampling SAP:

■ **Assessment of Completeness:**

COC Requested Analysis	Analyzed
Total Metals	Yes
Dissolved Metals	Yes
Nutrients	Yes
Anions/Alkalinity	Yes
Cyanide	Yes (WAD, Free, Total)
	Also, TDS/TSS

■ **Assessment of Holding Times:**

Parameter	Analysis Method	Holding Time (days)	Analysis (days post collection)	Note
TDS/TSS	SM 25470 C/D	7	14	Fail
Alkalinity	SM 2320B/2310B	14	13	Pass
Hardness	SM 2340B	28	27	Pass
Mercury (total)	245.1	28	21	Pass
Metals (total)	200.7	180	35	Pass
Metals (dissolved)	200.7	180	27	Pass
Metals (total), Sb, As, Se, Tl, U	200.8	180	21	Pass
Metals (dissolved), Sb, As, Se, Tl	200.8	180	16	Pass
Cyanide (WAD/free/total)	SM 4500/ASTM D7237/ EPA 335.4	14	14	Pass
Anions (Cl, F, SO ₄)	300.0	28	20	Pass
Ammonia, Nitrate/Nitrite	350/1, 353.2	28	16	Pass
Phosphorus, Total	SM 4500-P-E	28	17	Pass

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- Field Duplicate Sample Evaluation: Only one sample collected and analyzed, this element could not be evaluated.
- Charge Balance Errors: C/A balance (-0.18%) is less than 10% - Pass.
- Blank Samples: There were no field blanks collected. There were no detected concentrations of any analytes in the sample Blank – Pass.
- Laboratory vs. Field Analyses: Laboratory analyses of pH and conductivity were not reported. The lab measured and lab calculated TDS RPD was 89% - PASS

Analyte	Lab Value	Field Value	RPD (%)
pH	not reported	---	---
Conductivity	not reported	---	---

Sample #	Lab measured TDS	Lab calculated TDS	Ratio TDS
TDS	36 mg/L	40	0.89

- Comparison of Total and Dissolved Metal Analyses: Dissolved generally lower concentrations than total concentrations, except for calcium and sodium. Generally, given some measurement uncertainty, an RPD of greater than 20% will be considered unacceptable. For the samples with measureable concentrations, the RPDs were less than 20%. – PASS

Analyte	Dissolved (mg/L)	Total Recoverable (mg/L)	RPD (%)
Aluminum	-0.08	-0.08	0.00%
Antimony	-0.003	-0.003	0.00%
Arsenic	-0.003	-0.003	0.00%
Barium	0.0051	0.0057	11.11%
Beryllium	-0.002	-0.002	0.00%
Boron	-0.04	-0.04	0.00%
Cadmium	-0.002	-0.002	0.00%
Calcium	0.943	0.902	-4.44%
Chromium	-0.006	-0.006	0.00%
Cobalt	-0.006	-0.006	0.00%
Copper	-0.01	-0.01	0.00%
Iron	-0.06	-0.06	0.00%
Lead	-0.0075	-0.0075	0.00%
Magnesium	1.78	1.8	1.12%
Manganese	0.016	0.0161	0.62%
Molybdenum	-0.008	-0.008	0.00%
Nickel	-0.01	-0.01	0.00%
Potassium	-0.5	-0.5	0.00%
Selenium	-0.003	-0.003	0.00%
Silicon	7.34	7.7	4.79%
Silver	-0.005	-0.005	0.00%
Sodium	4.44	4.32	-2.74%
Thallium	-0.001	-0.001	0.00%

Analyte	Dissolved (mg/L)	Total Recoverable (mg/L)	RPD (%)
Titanium	-0.005	-0.005	0.00%
Uranium	not measured	-0.001	--
Vanadium	-0.005	-0.005	0.00%
Zinc	0.0148	0.0152	2.67%

Note: negative values denote that the analyte was not measured at the specified concentration (detection limit)

- Inter-laboratory Comparison: results from University of Surname laboratory have not yet been received for comparison of orthophosphate, TDS, and TSS so this could not be evaluated.
- Laboratory Follow-up: no follow-up was necessary from the validation of this data package from SVL

Summary:

	11012011-GW-001
Assessment of Completeness	●
Assessment of Holding Times ¹	○
Field Duplicate Sample Evaluation	NA
Charge Balance Errors	●
Blank samples	NA
Laboratory vs. Field Analyses ²	●,X
Comparison of Total and Dissolved	●
Inter-Laboratory Comparison	X

● = data OK, ○ = minor issue, see note, X = could not evaluate, NA = not applicable

Notes:

1 – the following analytes were analyzed past recommended holding times: TDS/TSS

2 – Laboratory measured vs. calculated TDS was OK for this sample, pH and conductivity not reported by the laboratory for comparison

Date: 20 January 2012

Project No.: 113-93245

To: File

Company:

From: Jeremy Clark

cc:

Email:

RE: DATA VALIDATION FOR SVL DATA PACKAGE W1K0635

NOTE: these samples were also analyzed in data package W1L0444 from a different size sieve.

Following is a summary of Golder's data validation review of SVL data package W1K0635 for 11 sediment samples:

- 11212011SD011 collected 21 November 2011
- 11212011SD012 collected 21 November 2011
- 11212011SD013 collected 21 November 2011
- 11222011SD015 collected 22 November 2011
- 11242011SD017 collected 24 November 2011
- 11242011SD018 collected 24 November 2011
- 11242011SD019 collected 24 November 2011
- 11242011SD119 collected 24 November 2011
- 11252011SD020 collected 25 November 2011
- 11252011SD120 collected 25 November 2011
- 11262011SD021 collected 26 November 2011

The following data validation elements were described in the sampling SAP:

- Assessment of Completeness: PASS

COC Requested Analysis for Sediments	Analyzed
Metals	Yes
Mercury	Yes
Cyanide (WAD, Free, Total)	Yes
TOC/ total organic matter	Yes



■ Assessment of Holding Times:

Parameter	Analysis Method	Holding Time (days)	Analysis (days post collection)	Note
Mercury	7471A	28	20-25	Pass
Metals	6010B/6020	180	25-30	Pass
Cyanide (WAD/free/total)	SM 4500/SW846 9012B/SW-846 9213	14	23-38	Fail
Total Organic Carbon (TOC)/ Total Organic Matter	USDA HB60	180	24-29	Pass

- Field Duplicate Sample Evaluation: There were a few analytes with an RPD greater than 20% for two duplicate sediment samples. For samples 11242011-SD019 and -SD119, the duplicate analysis of lead, zinc, TOC, and total organic matter had an RPD > 20%. For samples 11252011SD020 and -SD121, the duplicate analysis of mercury, TOC, and total organic matter had an RPD > 20%.

Analyte (mg/kg)	11242011-SD019	11242011-SD119	RPD		11252011-SD020	11252011-SD120	RPD	Note
Aluminum	3090	2900	6%		1480	1400	6%	Pass
Arsenic	0.342	0.324	5%		1.65	1.62	2%	Pass
Cadmium	-0.1	-0.1	0%		-0.1	-0.1	0%	Pass
Chromium	24.6	24.5	0%		9.17	8.73	5%	Pass
Copper	14.2	13.9	2%		2.36	2.16	9%	Pass
Cyanide (free)	-1	-1	0%		-1	-1	0%	Pass
Cyanide (total)	-0.5	-0.5	0%		-0.5	-0.5	0%	Pass
Cyanide (WAD)	-0.5	-0.5	0%		-0.5	-0.5	0%	Pass
Iron	13200	13100	1%		4320	4050	6%	Pass
Lead	3.36	2.64	24%		1.06	1.01	5%	Fail
Manganese	39.1	37.5	4%		13.4	12.4	8%	Pass
Mercury	0.162	0.152	6%		0.122	0.1	20%	Fail
Nickel	2.64	2.45	7%		1.65	1.58	4%	Pass
Selenium	0.781	0.721	8%		-0.3	-0.3	0%	Pass
Silver	-0.05	-0.05	0%		-0.05	-0.05	0%	Pass
Thallium	-0.1	-0.1	0%		-0.1	-0.1	0%	Pass
Total Organic Carbon	0.704	0.481	38%		0.12	0.158	27%	Fail
Total Organic Matter	1.21	0.829	37%		0.207	0.273	28%	Fail
Vanadium	22.6	22.3	1%		5.49	5.26	4%	Pass
Zinc	15	6.27	82%		2.44	2.24	9%	Fail

- Charge Balance Errors: Not applicable
- Blank Samples: No field blanks. There were no detections in the laboratory blank.
- Laboratory vs. Field Analyses: Not Applicable
- Comparison of Total and Dissolved Metal Analyses: Not Applicable
- Inter-laboratory Comparison: Not Applicable
- Laboratory Follow-up: no follow-up was necessary from the validation of this data package from SVL

Summary:

	11212011SD011	11212011SD012	11212011SD013	11222011SD015	11242011SD017	11242011SD018	11242011SD019	11242011SD119	11252011SD020	11252011SD120	11262011SD021
Assessment of Completeness	●	●	●	●	●	●	●	●	●	●	●
Assessment of Holding Times ¹	○	○	○	○	○	○	○	○	○	○	○
Field Duplicate Sample Evaluation	NA	NA	NA	NA	NA	NA	●	●	●	●	NA
Charge Balance Errors	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Blank samples	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Laboratory vs. Field Analyses	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Comparison of Total and Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inter-Laboratory Comparison	X	X	X	X	X	X	X	X	X	X	X

● = data OK, ○ = minor issue, see note, X = could not evaluate, NA = not applicable

Notes:

1 - All samples were analyzed past holding time for cyanide analyses.

Date: 30 January 2012

Project No.: 113-93245

To: File

Company:

From: Jeremy Clark

cc:

Email:

RE: DATA VALIDATION FOR SVL DATA PACKAGE W1L0012

Following is a summary of Golder's data validation review of SVL data package W10012 for 10 surface water and 2 groundwater samples:

- 11152011SW009 collected 15 November 2011
- 11152011SW010 collected 15 November 2011
- 11162011SW001 collected 16 November 2011
- 11162011SW002 collected 16 November 2011
- 11162011SW003 collected 16 November 2011
- 11182011SW004 collected 18 November 2011
- 11192011SW005 collected 19 November 2011
- 11202011SW006 collected 20 November 2011
- 11202011SW007 collected 20 November 2011
- 11202011SW008 collected 20 November 2011
- 11192011GW001 collected 19 November 2011
- 11192011GW002 collected 19 November 2011

The following data validation elements were described in the surface and ground water sampling SAP:

- Assessment of Completeness: PASS

COC Requested Analysis for GW	Analyzed
Total Metals + Mercury	Yes
Dissolved Metals+ Mercury	Yes (SW only)
NO2/NO3/Ammonia/Phos./COD	Yes
Anions/Alkalinity/TDS/TSS/pH	Yes
Cyanide (WAD, Free, Total)	Yes
TOC	Yes
Oil and Grease	Yes (ANATEK labs)



- Assessment of Holding Times: Analysis past holding times for TDS/TSS, pH, turbidity for all samples. Analysis past holding times for alkalinity and cyanide for samples 11162011-SW001, -SW002, and SW003.

Parameter	Analysis Method	Holding Time (days)	Analysis (days post collection)	Note
TDS/TSS	SM 25470 C/D	7	16-21	Fail
Alkalinity	SM 2320B/2310B	14	12-16	Pass; Fail for 11162011SW001,SW002 and SW003
Hardness	SM 2340B	28	24-28	Pass
Mercury (total)	245.1	28	24-28	Pass
Metals (total)	200.7	180	24-28	Pass
Metals (dissolved)	200.7	180	24-28	Pass
Metals (total), Sb, As, Se, Tl, U	200.8	180	18-22	Pass
Metals (dissolved) , Sb, As, Se, Tl	200.8	180	18-22	Pass
Cyanide (WAD/free/total)	SM 4500/ASTM D7237/ EPA 335.4	14	12-16	Pass; Fail for 11162011SW001,SW002 and SW003
Anions (Cl, F, SO ₄)	300.0	28	18-22	Pass
Ammonia, Nitrate/Nitrite	350/1, 353.2	28	16-28	Pass
Phosphorus, Total	SM 4500-P-E	28	19-23	Pass
Specific Conductance	120.1	28	12-16	Pass
Oil and Grease (Hexane extractable material)	1664A	28	16-23	Pass
Turbidity	180.1	2	12-16	Fail
Chemical Oxygen Demand (COD)	410.4	28	22-26	Pass
pH	SM 4500 H B	<1	12-16	Fail
Total Organic Carbon (TOC)	SM 5310B	28	18-21	Pass

- Field Duplicate Sample Evaluation: There were no field duplicates collected – Not Applicable
- Charge Balance Errors: C/A balance is less than 10% for all SW and GW samples – PASS
- Blank Samples: No field blanks. There were no detections in the laboratory blank.
- Laboratory vs. Field Analyses: Field and Lab pH and conductivity measurements were close within reason on all samples. The lab calculated TDS were close except -SW004, -SW007, and – SW008. These samples had a >50% difference in lab measured versus calculated TDS

sample ID	Field pH	Lab pH	Ratio	Field Cond.	Lab Cond.	Ratio	Lab Meas. TDS	Lab Calc. TDS	Ratio	Note
11192011GW001	6.37	6.95	92%	250.2	235	106%	181	218	0.83	Pass
11192011GW002	5.58	6.09	92%	80.6	73.6	110%	59	71	0.84	Pass
11162011SW001	6.57	6.33	104%	32.9	30.3	79%	27	28	0.97	Pass
11162011SW002	6.4	6.35	101%	32.5	30.7	106%	23	26	0.88	Pass
11162011SW003	6.05	6.09	99%	30.3	28.5	106%	32	25	1.28	Pass
11182011SW004	6.31	5.91	107%	30.6	26.4	116%	80	46	1.74	Fail
11192011SW005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
11202011SW006	6.71	6.29	107%	35.4	33.6	105%	36	27	1.34	Pass
11202011SW007	6.69	6.58	102%	56.9	53.6	106%	76	40	1.91	Fail
11202011SW008	6.75	6.64	102%	58.2	54.4	107%	63	40	1.57	Fail
11152011SW009	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
11152011SW010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Field Sample data copied from Field Forms:

Sample #	pH	conductivity (uS/cm)	temperature (oC)	DO (%)	Eh (rel mV)	ORP (mv)	Turbidity (NTU)
11192011GW001	6.37	250.2	26	12.7	78.3		9.85
11192011GW002	5.58	80.6	26.9	33.3	358.9		10.3
11162011SW001	6.57	32.9	27.2	NA	NA	398.5	20.8
11162011SW002	6.4	32.5	26.4	NA	NA	394.2	9.16
11162011SW003	6.05	30.3	28	74	NA	744	32.5
11182011SW004	6.31	30.6	28.8	NA	NA	531	NA
11192011SW005	NA	NA	NA	NA	NA	NA	NA
11202011SW006	6.71	35.4	29	59	NA	392.5	46
11202011SW007	6.69	56.9	32.5	60.6	NA	364.1	177
11202011SW008	6.75	58.2	32.7	65	NA	286.7	218
11152011SW009	NA	NA	NA	NA	NA	NA	NA
11152011SW010	NA	NA	NA	NA	NA	NA	NA

NM = Not measured/recorded on field forms

- Comparison of Total and Dissolved Metal Analyses: Generally, given some measurement uncertainty, an RPD of greater than 20% will be considered unacceptable when dissolved concentrations are greater than total. There was only one analysis where the dissolved was greater than total concentration – calcium in 11162011SW0001, where the dissolved concentration was only 1% higher than the total concentration. PASS
- Inter-laboratory Comparison: results from University of Surname laboratory have not yet been received for comparison of orthophosphate, TDS, and TSS
- Laboratory Follow-up: no follow-up was necessary from the validation of this data package from SVL

Summary:

	11192011GW001	11192011GW002	11162011SW001	11162011SW002	11162011SW003	11182011SW004	11192011SW005	11202011SW006	11202011SW007	11202011SW008	11152011SW009	11152011SW010
Assessment of Completeness	●	●	●	●	●	●	●	●	●	●	●	●
Assessment of Holding Times ¹	○	○	○	○	○	○	○	○	○	○	○	○
Field Duplicate Sample Evaluation	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Charge Balance Errors	●	●	●	●	●	●	●	●	●	●	●	●
Blank samples	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Laboratory vs. Field Analyses ²	●	●	●	●	●	○	●	●	○	○	●	●
Comparison of Total and Dissolved ⁶	●	●	●	●	●	●	●	●	●	●	●	●
Inter-Laboratory Comparison	X	X	X	X	X	X	X	X	X	X	X	X

● = data OK, ○ = minor issue, see note, X = could not evaluate, NA = not applicable

Notes:

- 1 - All samples of TDS/TSS, turbidity and pH were analyzed past holding times. Analysis past holding times for alkalinity and cyanide for samples 11162011-SW001, -SW002, and SW003.
- 2 - Field and Lab pH and conductivity measurements were close within reason on all samples. The lab calculated TDS were close except -SW004, -SW007, and -SW008. These samples had a >50% difference in lab measured versus calculated TDS

Date: 28 January 2012

Project No.: 113-93245

To: File

Company:

From: Jeremy Clark

cc:

Email:

RE: DATA VALIDATION FOR SVL DATA PACKAGE W1L0027

NOTE – There was a re-analysis of these samples later in December and in January with a different size sieve – other is Data package W1L0443.

Following is a summary of Golder’s data validation review of SVL data package W1L0027 for 8 sediment samples:

- 11162011SD001 collected 16 November 2011
- 11162011SD002 collected 16 November 2011 (note: identified as 11162011SW002 on COC and in data package)
- 11162011SD003 collected 16 November 2011 (note: identified as 11162011SW003 on COC and in data package)
- 11162011SD004 collected 16 November 2011 (note: identified as 11162011SW003 on COC and in data package)
- 11202011SD006 collected 20 November 2011 (note: identified as 11202011SW003 on COC and in data package)
- 11202011SD007 collected 20 November 2011 (note: identified as 11202011SW003 on COC and in data package)
- 11202011SD008 collected 20 November 2011 (note: identified as 1102011SW003 on COC and in data package)

The following data validation elements were described in the sampling SAP:

- Assessment of Completeness: PASS

COC Requested Analysis for Sediments	Analyzed
Metals	Yes
Mercury	Yes
Cyanide (WAD, Free, Total)	Yes
ALSO: TOC/ total organic matter	Yes (not requested on COC)



■ Assessment of Holding Times:

Parameter	Analysis Method	Holding Time (days)	Analysis (days post collection)	Note
Mercury	7471A	28	26-30	Pass: Fail for samples SD1-4
Metals	6010B/6020	180	30-35	Pass
Cyanide (WAD/free/total)	SM 4500/SW846 9012B/SW-846 9213	14	29-43	Fail
Total Organic Carbon (TOC)/ Total Organic Matter	USDA HB60	180	30-34	Pass

- Field Duplicate Sample Evaluation: No field duplicates were identified – Not Applicable
- Charge Balance Errors: Not applicable
- Blank Samples: No field blanks. There were no detections in the laboratory blank.
- Laboratory vs. Field Analyses: Not Applicable
- Comparison of Total and Dissolved Metal Analyses: Not Applicable
- Inter-laboratory Comparison: Not Applicable
- Laboratory Follow-up: no follow-up was necessary from the validation of this data package from SVL

Summary:

	11162011SD001	11162011SD002	11162011SD003	11162011SD004	11202011SD006	11202011SD007	11202011SD008	11162011SD001
Assessment of Completeness	●	●	●	●	●	●	●	●
Assessment of Holding Times ¹	○	○	○	○	○	○	○	○
Field Duplicate Sample Evaluation	NA	NA	NA	NA	NA	NA	NA	NA
Charge Balance Errors	NA	NA	NA	NA	NA	NA	NA	NA
Blank samples	NA	NA	NA	NA	NA	NA	NA	NA
Laboratory vs. Field Analyses	NA	NA	NA	NA	NA	NA	NA	NA
Comparison of Total and Dissolved	NA	NA	NA	NA	NA	NA	NA	NA
Inter-Laboratory Comparison	NA	NA	NA	NA	NA	NA	NA	NA

● = data OK, ○ = minor issue, see note, X = could not evaluate, NA = not applicable

Notes:

- 1 - All samples were analyzed past holding time for cyanide analyses. Cyanide was analyzed past holding time for samples 11162011SD001, -SD002, -SD003, and -SD004



TECHNICAL MEMORANDUM

Date: 28 January 2012

Project No.: 113-93245

To: File

Company:

From: Jeremy Clark

cc:

Email:

RE: DATA VALIDATION FOR SVL DATA PACKAGE W1L0358

Following is a summary of Golder's data validation review of SVL data package W10358 for 9 ground water samples:

- M2-PZ1-TW collected 12 December 2011
- MA-PZ1-TW1-R collected 12 December 2011
- MA-PZ6-TW collected 11 December 2011
- TSF-MW-1 collected 13 December 2011
- TSF-PZ5 collected 8 December 2011
- TSF-P-8-E collected 14 December 2011
- TSF-P-8-F collected 14 December 2011
- TSF-TW-3 collected 13 December 2011
- TSF-TW-5-DUP collected 8 December 2011

The following data validation elements were described in the surface and ground water sampling SAP:

- Assessment of Completeness: Fail

COC Requested Analysis for GW	Analyzed
Total Metals + Mercury	Yes
Dissolved Metals+ Mercury	Yes
NO2/NO3/Ammonia/COD	Yes
Anions/Alkalinity/TDS/TSS/pH/EC	Yes
Cyanide (WAD, Free, Total)	Yes
TOC	Yes
Oil and Grease, Phenols	NO

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■ Assessment of Holding Times:

Parameter	Analysis Method	Holding Time (days)	Analysis (days post collection)	Note
TDS/TSS	SM 25470 C/D	7	6-12	Pass (TSF-PZ-8-E and TSF-PZ-8-F); Fail for all others
Alkalinity	SM 2320B/2310B	14	6-12	Pass
Hardness	SM 2340B	28	18-24	Pass
Mercury (total)	245.1	28	20-26	Pass
Metals (total)	200.7	180	20-26	Pass
Metals (dissolved)	200.7	180	16-24	Pass
Metals (total), Sb, As, Se, Tl, U	200.8	180	13-19	Pass
Metals (dissolved), Sb, As, Se, Tl	200.8	180	14-20	Pass
Cyanide (WAD/free/total)	SM 4500/ASTM D7237/ EPA 335.4	14	7-15	Pass: Fail for TSF-PZ5, TSF-TW-5-DUP for WAD)
Anions (Cl, F, SO ₄)	300.0	28	7-13	Pass
Ammonia, Nitrate/Nitrite	350/1, 353.2	28	21-27	Pass
Phosphorus, Total	SM 4500-P-E	28	16-22	Pass
Specific Conductance	120.1	28	6-12	Pass
Oil and Grease (Hexane extractable material)	1664A	28		
Turbidity	180.1	2	6-12	Fail
pH	SM 4500 H B	<1	6-12	Fail
Total Organic Carbon (TOC)	SM 5310B	28		

- Field Duplicate Sample Evaluation: There were no field duplicates analyzed
- Charge Balance Errors: C/A balance is less than 10% for all SW and GW samples EXCEPT for TSF-PZ-8-E (17%) and TSF-PZ-8-F (12.5%).
- Blank Samples: No field blanks. There were no detections in the laboratory blank.

- Laboratory vs. Field Analyses: Field and Lab pH measurements were close on all samples. Field and lab conductivity measurements were close on all samples except for TSF-MW-1. The lab calculated TDS were off on: M2-PZ1-TW, MA-PZ6-TW, and TSF-TW-5-DUP.

sample ID	Field pH	Lab pH	Ratio	Field Cond.	Lab Cond.	Ratio	Lab Meas. TDS	Lab Calc. TDS	Ratio	Note
M2-PZ1-TW	7.05	7.44	0.95	443	418	1.06	200	286	0.70	Fail
MA-PZ1-TW1-R	6.69	7.34	0.91	383	363	1.06	228	281	0.81	Pass
MA-PZ6-TW	NR	7.64	NR	NR	421	NR	212	294	0.72	Fail
TSF-MW-1	6.22	6.70	0.93	221.7	179	1.24	114	130	0.87	Fail
TSF-PZ5	5.93	6.53	0.91	176.5	169	1.04	138	159	0.87	Pass
TSF-PZ-8-E	NR	6.05	NR	NR	10	NR	<20	5	NR	Pass
TSF-PZ-8-F	NR	5.99	NR	NR	9	NR	<20	4	NR	Pass
TSF-TW-3	6.72	7.09	0.95	379	341	1.11	254	245	1.03	Pass
TSF-TW-5-DUP	NR	6.52	NR	NR	156	NR	80	160	0.5	Fail

All Field Sample data copied from Field Forms:

Well#	pH	Conductivity (uS/cm)	Temperature (oC)	DO (mg/L)	Eh (rel mV)	Turbidity (NTU)
M2-PZ1-TW	7.05	443	25.3	1.07	77.4	30.3
MA-PZ1-TW1-R	6.69	383	28.5	1.98	49.6	0.92
MA-PZ6-TW	NR	NR	NR	NR	NR	NR
TSF-MW-1	6.22	221.7	29	1.61	180.8	8.61
TSF-PZ5	5.93	176.5	26.7		331.2	6.6
TSF-PZ-8-E	NR	NR	NR	NR	NR	NR
TSF-PZ-8-F	NR	NR	NR	NR	NR	NR
TSF-TW-3	6.72	379	23.8	1.6	25.2	124
TSF-TW-5-DUP	NR	NR	NR	NR	NR	NR
TSF-PZ3-TW (not analyzed)	7.22	408	26.3	0.81	90.1	180

NR = Not reported/ no field form

- Comparison of Total and Dissolved Metal Analyses: Generally, given some measurement uncertainty, an RPD of greater than 20% will be considered unacceptable when dissolved concentrations are greater than total. For all samples, generally potassium and sodium were higher in the dissolved measurements than total. However, the only analysis with an RPD >20% was the Potassium measurement in TSF-MW-1 (dissolved = 0.82 mg/L, total = 0.66 mg/L) with an RPD of 22%.

- Inter-laboratory Comparison: Following is a comparison of results from University of Surname laboratory for comparison of phosphate, TDS, and TSS with SVL labs. There is general concordance of phosphorus, TSS and TDS, with the exception of the sample from TSF-TW-3.

	University Lab Data	SVL Lab Data	University Lab Data	SVL Lab Data	University Lab Data	SVL Lab Data
Location:	P (mg/L)(after digestion)	P (mg/L)	TSS (mg/L)	TSS (mg/L)	TDS (mg/L)	TDS (mg/L)
FIELD BLANC			0	-5	55	12
MA-PZ1-TW1	0.27	0.137	0	-10	328	228
MA-PZ1-TW1			6	-10	325	228
MA-PZ6-TW	0.22	0.065	23	24	337	212
MZ-PZ1-TW1	0.38		58		296	
TSF-MW-1	0.04	0.049	0	-10	132	114
TSF-MW-1-SA			18		236	
TSF-PZ3-TW			288		512	
TSF-PZ5	0.34	-0.005	13	18	192	138
TSF-PZ5-DVP	0.92		10		230	
TSF-PZ-8-E	0.00	-0.01	0	-10	13	-20
TSF-PZ-8-F	0.01	-0.01	0	-10	11	-20
TSF-TW-3	0.02	0.124	27	194	497	254

- Laboratory Follow-up: no follow-up was necessary from the validation of this data package from SVL

Summary:

	M2-PZ1-TW	MA-PZ1-TW1-R	MA-PZ6-TW	TSF-MW-1	TSF-PZ5	TSF-PZ-8-E	TSF-PZ-8-F	TSF-TW-3	TSF-TW-5-DUP
Assessment of Completeness 1	○	○	○	○	○	○	○	○	○
Assessment of Holding Times 2	○	○	○	○	○	○	○	○	○
Field Duplicate Sample Evaluation	NA	NA	NA	NA	NA	NA	NA	NA	NA
Charge Balance Errors ³	●	●	●	●	●	○	○	●	●
Blank samples	NA	NA	NA	NA	NA	NA	NA	NA	NA
Laboratory vs. Field Analyses 4	○	●	○	○	●	●	●	●	○
Comparison of Total and Dissolved 5	●	●	●	○	●	●	●	●	●
Inter-Laboratory Comparison 6	NA	●	●	●	●	●	●	○	NA

● = data OK, ○ = minor issue, see note, X = could not evaluate, NA = not applicable

Notes:

- 1 - no results for oil and grease or phenols as requested on COC
- 2 - All samples of turbidity and pH were analyzed past holding times. The following samples for Cyanide (WAD) were analyzed past holding time: TSF-PZ5, TSF-TW-5-DUP. The following samples for TDS/TSS were analyzed past holding times: M2-PZ1-TW, MA-PZ1-TW1-R, MA-PZ6-TW, TSF-MW-1, TSF-PZ5, TSF-TW-3, TSF-TW-5-DUP.
- 3 - For samples PSF-PZ-8-E and -8-F, the charge balance errors were >10%.
- 4 - Conductivity error for TSF-MW-1; TDS errors for M2-PZ1-TW, MA-PZ6-TW, and TSF-TW-5-DUP
- 5 - Potassium measurement in TSF-MW-1 (dissolved = 0.82 mg/L, total = 0.66 mg/L) with an RPD of 22%
- 6 - Comparison of P, TSS, TDS off comparing University Lab data with SVL



TECHNICAL MEMORANDUM

Date: 30 January 2012

Project No.: 113-93245

To: File

Company:

From: Jeremy Clark

cc:

Email:

RE: DATA VALIDATION FOR SVL DATA PACKAGE W1L0423

Following is a summary of Golder's data validation review of SVL data package W1L0423 for four surface water samples and one sediment sample (the sediment sample is also reported in data package W1L0450 with a different size sieve):

- 12162011SW025 collected 16 December 2011
- 12172011SW026 collected 17 December 2011
- 12172011SW027 collected 17 December 2011
- 12172011SW028 collected 17 December 2011
- 12162011SD025 collected 16 December 2011 (reported as sample ID 12162011SW025 on COC form, but data are for sediments)

The following data validation elements were described in the surface and ground water sampling SAP:

- Assessment of Completeness: PASS

COC Requested Analysis for GW	Analyzed
Total Metals + Hg + U	Yes
Dissolved Metals+ Hg + U	Yes
TDS/TSS, Alkalinity,Anions,pH,Conductivity	Yes
Cyanide (WAD, Free, Total)	Yes
NO2/NO3/Ammonia/Phos./COD	Yes
TSS/Turbidity	Yes
COC Requested Analysis for Sediment	Analyzed
Metals and TOC	Yes

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■ Assessment of Holding Times:

Parameter	Analysis Method	Holding Time (days)	Analysis (days post collection)	Note
TDS/TSS	SM 25470 C/D	7	5-6	Pass
Alkalinity	SM 2320B/2310B	14	11	Pass
Hardness	SM 2340B	28	20	Pass
Mercury (total & dissolved)	245.1	28	19	Pass
Metals (total)	200.7	180	20	Pass
Metals (dissolved)	200.7	180	20	Pass
Metals (total), Sb, As, Se, Tl, U	200.8	180	24	Pass
Metals (dissolved) , Sb, As, Se, Tl	200.8	180	12	Pass
Metals	6010B	180	20	Pass
Cyanide (WAD/free/total)	SM 4500/ASTM D7237/ EPA 335.4	14	12-14	Pass
Anions (Cl, F, SO ₄)	300.0	28	11-12	Pass
Ammonia, Nitrate/Nitrite	350/1, 353.2	28	20	Pass
Phosphorus, Total	SM 4500-P-E	28	19	Pass
Specific Conductance	120.1	28	6	Pass
Turbidity	180.1	2	5-6	Fail
Chemical Oxygen Demand (COD)	410.4	28	14	Pass
pH	SM 4500 H B	<1	11	Fail
Total Organic Carbon (TOC)	SM 5310B	28	20	Pass

- Field Duplicate Sample Evaluation: There were no field duplicates.
- Charge Balance Errors: C/A balance is less than 10% for all SW samples – PASS
- Blank Samples: There were no blank samples collected.
- Laboratory vs. Field Analyses: Field and Lab pH and conductivity measurements were close on all samples except the pH on 11212011SW013 and the conductivity of SW017 and SW120. The lab calculated TDS were off on all samples except the SW221 (field blank). The notes on the analytical report state that TDS was difficult to sample for this set of samples.

sample ID	Field pH	Lab pH	Ratio	Field Cond.	Lab Cond.	Ratio	Lab Meas. TDS	Lab Calc. TDS	Ratio	Note
12162011SW025	5.03	5.24	0.96	25.39	23.4	1.09	<10	21	<0.5	Pass

Field Sample data copied from Field Form:

Sample #	Water Temp (°C)	Conductivity (µS/cm)	Turbidity (NTU)	pH	Dissolved Oxygen (mg/L)	ORP (mV)
12162011SW025	24.3	25.39	2.21	5.03	4.36	323.4

- Comparison of Total and Dissolved Metal Analyses: Generally, given some measurement uncertainty, an RPD of greater than 20% will be considered unacceptable when dissolved concentrations are greater than total. There were only three analytes for sample 12162011SW025 that had dissolved concentrations greater than total (calcium, manganese, and sodium), but these differences were all <20%. – PASS
- Inter-laboratory Comparison: results from University of Surname laboratory have not yet been received for comparison of orthophosphate, TDS, and TSS
- Laboratory Follow-up: no follow-up was necessary from the validation of this data package from SVL

Summary:

	12162011SW025	12172011SW026	12172011SW027	12172011SW028	12162011SD025
Assessment of Completeness	●	●	●	●	●
Assessment of Holding Times ¹	○	○	○	○	●
Field Duplicate Sample Evaluation	NA	NA	NA	NA	NA
Charge Balance Errors	●	NA	NA	NA	NA
Blank samples	NA	NA	NA	NA	NA
Laboratory vs. Field Analyses	●	NA	NA	NA	NA
Comparison of Total and Dissolved	●	NA	NA	NA	NA
Inter-Laboratory Comparison	X	X	X	X	X

● = data OK, ○ = minor issue, see note, X = could not evaluate, NA = not applicable

Notes:

1 - All samples of turbidity and pH were analyzed past holding times.

Date: 28 January 2012

Project No.: 113-93245

To: File

Company:

From: Jeremy Clark

cc:

Email:

RE: DATA VALIDATION FOR SVL DATA PACKAGE W1L0443

NOTE – There was an analysis of these samples earlier in December 2011 with a different size sieve – Data package W1L0027.

Following is a summary of Golder's data validation review of SVL data package W1L0443 for 8 sediment samples:

- 11162011SD001 collected 16 November 2011
- 11162011SD002 collected 16 November 2011 (note: identified as 11162011SW002 on COC and in data package)
- 11162011SD003 collected 16 November 2011 (note: identified as 11162011SW003 on COC and in data package)
- 11162011SD004 collected 16 November 2011 (note: identified as 11162011SW003 on COC and in data package)
- 11202011SD006 collected 20 November 2011 (note: identified as 11202011SW003 on COC and in data package)
- 11202011SD007 collected 20 November 2011 (note: identified as 11202011SW003 on COC and in data package)
- 11202011SD008 collected 20 November 2011 (note: identified as 1102011SW003 on COC and in data package)

The following data validation elements were described in the sampling SAP:

- Assessment of Completeness: PASS

COC Requested Analysis for Sediments	Analyzed
Metals	Yes
Mercury	Yes
Cyanide (WAD, Free, Total)	Yes
ALSO: TOC/ total organic matter	Yes (not requested on COC)

- Assessment of Holding Times:

Parameter	Analysis Method	Holding Time (days)	Analysis (days post collection)	Note
Mercury	7471A	28	38-42	Fail
Metals	6010B/6020	180	45-50	Pass
Cyanide (WAD/free/total)	SM 4500/SW846	14	38-44	Fail



	9012B/SW-846 9213			
Total Organic Carbon (TOC)/ Total Organic Matter	USDA HB60	180	46-50	Pass

- Field Duplicate Sample Evaluation: No field duplicates were identified – Not Applicable
- Charge Balance Errors: Not applicable
- Blank Samples: No field blanks. There were no detections in the laboratory blank.
- Laboratory vs. Field Analyses: Not Applicable
- Comparison of Total and Dissolved Metal Analyses: Not Applicable
- Inter-laboratory Comparison: Not Applicable
- Laboratory Follow-up: no follow-up was necessary from the validation of this data package from SVL

Summary:

	11162011SD001	11162011SD002	11162011SD003	11162011SD004	11202011SD006	11202011SD007	11202011SD008	11162011SD001
Assessment of Completeness	●	●	●	●	●	●	●	●
Assessment of Holding Times ¹	○	○	○	○	○	○	○	○
Field Duplicate Sample Evaluation	NA	NA	NA	NA	NA	NA	NA	NA
Charge Balance Errors	NA	NA	NA	NA	NA	NA	NA	NA
Blank samples	NA	NA	NA	NA	NA	NA	NA	NA
Laboratory vs. Field Analyses	NA	NA	NA	NA	NA	NA	NA	NA
Comparison of Total and Dissolved	NA	NA	NA	NA	NA	NA	NA	NA
Inter-Laboratory Comparison	NA	NA	NA	NA	NA	NA	NA	NA

● = data OK, ○ = minor issue, see note, X = could not evaluate, NA = not applicable

Notes:

1 - All samples were analyzed past holding time for mercury and cyanide



TECHNICAL MEMORANDUM

Date: 28 January 2012

Project No.: 113-93245

To: File

Company:

From: Jeremy Clark

cc:

Email:

RE: DATA VALIDATION FOR SVL DATA PACKAGE W1L0444

NOTE: these samples were also analyzed in data package W1K0635 with a different size sieve.

Following is a summary of Golder's data validation review of SVL data package W1L044 for 11 sediment samples:

- 11212011SD011 collected 21 November 2011
- 11212011SD012 collected 21 November 2011
- 11212011SD013 collected 21 November 2011
- 11222011SD015 collected 22 November 2011
- 11242011SD017 collected 24 November 2011
- 11242011SD018 collected 24 November 2011
- 11242011SD019 collected 24 November 2011
- 11242011SD119 collected 24 November 2011
- 11252011SD021 collected 25 November 2011
- 11252011SD120 collected 25 November 2011
- 11262011SD021 collected 26 November 2011

The following data validation elements were described in the sampling SAP:

- Assessment of Completeness: PASS

COC Requested Analysis for Sediments	Analyzed
Metals	Yes
Mercury	Yes
ALSO: Cyanide (WAD, Free, Total)	Yes (not requested on COC)
ALSO: TOC/ total organic matter	Yes (not requested on COC)

- Assessment of Holding Times:

Parameter	Analysis Method	Holding Time (days)	Analysis (days post collection)	Note
Mercury	7471A	28	32-37	Fail
Metals	6010B/6020	180	39-45	Pass
Cyanide (WAD/free/total)	SM 4500/SW846 9012B/SW-846 9213	14	32-39	Fail

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Total Organic Carbon (TOC)/ Total Organic Matter	USDA HB60	180	40-45	Pass
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- Field Duplicate Sample Evaluation: Both Field duplicated had an RPD < 20% for all analytes – PASS

Analyte (mg/kg)	11242011- SD019	11242011- SD119	RPD		11252011- SD020	11252011- SD120	RPD	Note
Aluminum	4290	4200	2%		7410	7150	4%	Pass
Arsenic	-0.3	-0.3	0%		8.98	7.71	15%	Pass
Cadmium	-0.1	-0.1	0%		-0.1	-0.1	0%	Pass
Chromium	38.3	38.2	0%		59.9	60.9	-2%	Pass
Copper	22.5	22.3	1%		17.1	16.5	4%	Pass
Cyanide (free)	-1	-1	0%		-1	-1	0%	Pass
Cyanide (total)	-0.5	-0.5	0%		-0.5	-0.5	0%	Pass
Cyanide (WAD)	-0.5	-0.5	0%		-0.5	-0.5	0%	Pass
Iron	20400	20300	0%		29600	29600	0%	Pass
Lead	3.2	3.15	2%		5.37	4.89	9%	Pass
Manganese	48.4	46.9	3%		87.8	88.2	0%	Pass
Mercury	0.165	0.155	6%		0.518	0.505	3%	Pass
Nickel	3.78	3.77	0%		11	10.9	1%	Pass
Selenium	0.691	0.71	-3%		0.601	0.519	15%	Pass
Silver	-0.05	-0.05	0%		-0.05	-0.05	0%	Pass
Thallium	-0.1	-0.1	0%		-0.1	-0.1	0%	Pass
Total Organic Carbon	0.346	0.303	13%		0.495	0.525	-6%	Pass
Total Organic Matter	0.597	0.523	13%		0.853	0.905	-6%	Pass
Vanadium	33.4	33	1%		32	32.6	-2%	Pass
Zinc	10.3	9.89	4%		18	17.7	2%	Pass

- Charge Balance Errors: Not applicable
- Blank Samples: No field blanks. There were no detections in the laboratory blank.
- Laboratory vs. Field Analyses: Not Applicable
- Comparison of Total and Dissolved Metal Analyses: Not Applicable
- Inter-laboratory Comparison: Not Applicable
- Laboratory Follow-up: no follow-up was necessary from the validation of this data package from SVL

Summary:

	11212011SD011	11212011SD012	11212011SD013	11222011SD015	11242011SD017	11242011SD018	11242011SD019	11242011SD119	11252011SD020	11252011SD120	11262011SD021
Assessment of Completeness	●	●	●	●	●	●	●	●	●	●	●
Assessment of Holding Times ¹	○	○	○	○	○	○	○	○	○	○	○
Field Duplicate Sample Evaluation	NA	NA	NA	NA	NA	NA	●	●	●	●	NA
Charge Balance Errors	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Blank samples	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Laboratory vs. Field Analyses	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Comparison of Total and Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inter-Laboratory Comparison	X	X	X	X	X	X	X	X	X	X	X

● = data OK, ○ = minor issue, see note, X = could not evaluate, NA = not applicable

Notes:

1 - All samples were analyzed past holding time for mercury and cyanide

Date: 30 January 2012

Project No.: 113-93245

To: File

Company:

From: Jeremy Clark

cc:

Email:

RE: DATA VALIDATION FOR SVL DATA PACKAGE W1L0450

NOTE: these samples were also analyzed in data package W1K0635 with a different size sieve.

Following is a summary of Golder's data validation review of SVL data package W1L0450 for 1 sediment samples:

- 12162011SD025 collected 16 December 2011 (COC and analysis reports the sample number as 12162011SW015)

The following data validation elements were described in the sampling SAP:

- Assessment of Completeness: PASS

COC Requested Analysis for Sediments	Analyzed
Metals and TOC	Yes

- Assessment of Holding Times:

Parameter	Analysis Method	Holding Time (days)	Analysis (days post collection)	Note
Mercury	7471A	28	21	Pass
Metals	6010B/6020	180	19-20	Pass
Cyanide (WAD/free/total)	SM 4500/SW846 9012B/SW-846 9213	14	12-14	Pass
Total Organic Carbon (TOC)/ Total Organic Matter	USDA HB60	180	20	Pass

- Field Duplicate Sample Evaluation: No field duplicates were analyzed
- Charge Balance Errors: Not applicable
- Blank Samples: No field blanks. There were no detections in the laboratory blank.
- Laboratory vs. Field Analyses: Not Applicable
- Comparison of Total and Dissolved Metal Analyses: Not Applicable
- Inter-laboratory Comparison: Not Applicable
- Laboratory Follow-up: no follow-up was necessary from the validation of this data package from SVL



Summary:

	12162011SD025
Assessment of Completeness	●
Assessment of Holding Times	●
Field Duplicate Sample Evaluation	NA
Charge Balance Errors	NA
Blank samples	NA
Laboratory vs. Field Analyses	NA
Comparison of Total and Dissolved	NA
Inter-Laboratory Comparison	X

● = data OK, ○ = minor issue, see note, X = could not evaluate, NA = not applicable

Date: 6 April 2012

Project No.: 113-93245

To: File

Company:

From: Jeremy Clark

cc:

Email:

RE: DATA VALIDATION FOR SVL DATA PACKAGE W2B0099

Following is a summary of Golder's data validation review of SVL data package W2B0099 for ten ground water samples:

- TSF-PZ-7 collected 25 January 2012
- TSF-TW-2R collected 27 January 2012
- TSF-PZ-2 collected 27 January 2012
- MA-PZ-1-TW collected 25 January 2012
- TSF-TW-5 collected 24 January 2012
- TSF-TW-3 collected 24 January 2012
- M2-PZ-1-TW collected 26 January 2012
- MA-TW-6 collected 26 January 2012
- TSF-MW-1 collected 23 January 2012
- DUP-100 (duplicate of TSF-TW-2)

The following data validation elements were described in the surface and ground water sampling SAP:

- Assessment of Completeness: PASS

COC Requested Analysis for GW	Analyzed
TDS, TSS, Nitrate, Nitrite	Yes

- Assessment of Holding Times:

Parameter	Analysis Method	Holding Time (days)	Analysis (days post collection)	Note
TDS/TSS	SM 25470 C/D	7	13-16	Fail
Nitrate/Nitrite	353.2	28	19-23	Pass

- Field Duplicate Sample Evaluation: Sample Dup-100 was a duplicate for TSF-TW-2. The RPD was greater than 20% for nitrate and total suspended solids, but less than 20% for total dissolved solids (using the detection limit of 100 mg/L when there was no TDS measured).

Analyte	DUP-100	TSF-TW-2R	RPD	Note
Nitrate/Nitrite as N	0.15	<0.05	>100%	Fail
Total Diss. Solids	120	<100	>18%	Pass
Total Susp. Solids	48	5	162%	Fail



- Charge Balance Errors: Not applicable for this analysis
- Blank Samples: There was no field blank. There was no detection of N, TDS, or TSS in the lab blank.
- Laboratory vs. Field Analyses: Not applicable
- Comparison of Total and Dissolved Metal Analyses: Not applicable
- Inter-laboratory Comparison: results from University of Surname laboratory have not yet been received for comparison of TDS, and TSS
- Laboratory Follow-up: no follow-up was necessary from the validation of this data package from SVL

Summary:

	DUP-100	M2-PZ-1-TW	MA-PZ-1-TW	MA-TW-6	TSF-MW-1	TSF-PZ-2	TSF-PZ-7	TSF-TW-2R	TSF-TW-3	TSF-TW-5
Assessment of Completeness	●	●	●	●	●	●	●	●	●	●
Assessment of Holding Times ¹	○	○	○	○	○	○	○	○	○	○
Field Duplicate Sample Evaluation ²	○	NA	NA	NA	NA	NA	NA	○	NA	NA
Charge Balance Errors	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Blank samples	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Laboratory vs. Field Analyses	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Comparison of Total and Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inter-Laboratory Comparison	X	X	X	X	X	X	X	X	X	X

● = data OK, ○ = minor issue, see note, X = could not evaluate, NA = not applicable

Notes:

1 - All samples of TDS/TSS were analyzed past the recommended holding time

2 – The duplicate measurements of nitrate/nitrite and total suspended solids were > 100%. The duplicate measurement of TDS was >18%.



TECHNICAL MEMORANDUM

Date: 6 April 2012

Project No.: 113-93245

To: File

Company:

From: Jeremy Clark

cc:

Email:

RE: DATA VALIDATION FOR SVL DATA PACKAGE W2B0100

Following is a summary of Golder's data validation review of SVL data package W2B0100 for ten ground water samples:

- TSF-PZ-7 collected 25 January 2012
- TSF-TW-2R collected 27 January 2012
- TSF-PZ-2 collected 27 January 2012
- MA-PZ-1-TW collected 25 January 2012
- TSF-TW-5 collected 24 January 2012
- TSF-TW-3 collected 24 January 2012
- M2-PZ-1-TW collected 26 January 2012
- MA-TW-6 collected 26 January 2012
- TSF-MW-1 collected 23 January 2012
- DUP-100 (duplicate of TSF-TW-2)

The following data validation elements were described in the surface and ground water sampling SAP:

- Assessment of Completeness: PASS

COC Requested Analysis for GW	Analyzed
Dissolved Metals	Yes
TDS, TSS,	Yes
Anions/Alkalinity/Sulfate	Yes
NO ₂ /NO ₃ /Ammonia/Phos./	Yes
pH, Conductivity	Yes
Cyanide (WAD, Free, Total)	Yes
Also: Total Metals	Yes

- Assessment of Holding Times:

Parameter	Analysis Method	Holding Time (days)	Analysis (days post collection)	Note
TDS/TSS	SM 25470 C/D	7	14-18	Fail

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Alkalinity	SM 2320B/2310B	14	13-17	Pass; Fail for 8 samples
Hardness	SM 2340B	28	19-23	Pass
Mercury (total, dissolved)	245.1	28	17-21	Pass
Metals (total)	200.7	180	17-21	Pass
Metals (dissolved)	200.7	180	19-23	Pass
Metals (total), Sb, As, Se, Tl, U	200.8	180	24-28	Pass
Metals (dissolved) , Sb, As, Se, Tl	200.8	180	24-28	Pass
Cyanide (WAD/free/total)	SM 4500/ASTM D7237/ EPA 335.4	14	14-18	Pass; Fail for 8 samples
Anions (Cl, F, SO4)	300.0	28	17-21	Pass
Ammonia, Nitrate/Nitrite	350.1, 353.2	28	18-26	Pass
Phosphorus, Total	SM 4500-P-E	28	20-24	Pass
Specific Conductance	120.1	28	14-18	Pass
Turbidity	180.1	2	13-17	Fail
pH	SM 4500 H B	<1	13-17	Fail

- Field Duplicate Sample Evaluation: Generally, if the analyte was present at concentrations less than the detection limit in one sample, it was less than the detection limit in the duplicate sample. However, if the analyte was present at concentrations greater than the detection limit, the duplicate analysis did not report close (within 20%) to the same value. The RPD was > 20% for: Aluminum, Barium, Bicarbonate, Calcium, Hardness, Iron, Magnesium, Manganese (total only), Nickel (dissolved only), Nitrate, Phosphorus, Potassium, Silicon, Sodium, Specific conductance, Sulfate, Total alkalinity, TDS, TSS, Turbidity, Zinc.

Analyte	DUP-100	TSF-TW-2R	RPD
Aluminum			
Dissolved	0.15	-0.08	61%
Total Recoverable	0.789	-0.08	163%
Ammonia as N	0.088	0.077	13%
Antimony			
Dissolved	-0.003	-0.003	0%
Total Recoverable	-0.003	-0.003	0%
Arsenic			
Dissolved	-0.003	-0.003	0%
Total Recoverable	-0.003	-0.003	0%
Barium			
Dissolved	0.0028	0.0043	-42%
Total Recoverable	0.0087	0.0044	66%
Beryllium			
Dissolved	-0.0002	-0.0002	0%
Total Recoverable	-0.0002	-0.0002	0%

Analyte	DUP-100	TSF-TW-2R	RPD
Bicarbonate	24.8	11.3	75%
Boron			
Dissolved	-0.04	-0.04	0%
Total Recoverable	-0.04	-0.04	0%
Cadmium			
Dissolved	-0.0002	-0.0002	0%
Total Recoverable	-0.0002	-0.0002	0%
Calcium			
Dissolved	0.238	0.919	-118%
Total Recoverable	0.484	0.854	-55%
Carbonate	-1	-1	0%
Chloride	4.01	4.9	-20%
Chromium			
Dissolved	-0.006	-0.006	0%
Total Recoverable	-0.006	-0.006	0%
Cobalt			
Dissolved	-0.006	-0.006	0%
Total Recoverable	-0.006	-0.006	0%
Copper			
Dissolved	-0.001	0.0012	-18%
Total Recoverable	0.00106	-0.001	6%
Cyanide (free)	-0.005	-0.005	0%
Cyanide (total)	-0.01	-0.01	0%
Cyanide (WAD)	-0.01	-0.01	0%
Fluoride	-0.1	-0.1	0%
Hardness (as CaCO₃)	0.877	10.7	-170%
Iron			
Dissolved	0.204	-0.06	109%
Total Recoverable	0.642	0.148	125%
Lead			
Dissolved	-0.003	-0.003	0%
Total Recoverable	0.00399	-0.003	28%
Magnesium			
Dissolved	0.069	2.03	-187%
Total Recoverable	0.215	1.94	-160%
Manganese			
Dissolved	0.0249	0.0227	9%
Total Recoverable	0.0497	0.0182	93%
Mercury			
Dissolved	-0.0002	-0.0002	0%

Analyte	DUP-100	TSF-TW-2R	RPD
Total	-0.0002	-0.0002	0%
Molybdenum			
Dissolved	-0.008	-0.008	0%
Total Recoverable	-0.008	-0.008	0%
Nickel			
Dissolved	-0.01	0.016	-46%
Total Recoverable	-0.01	0.011	-10%
Nitrate/Nitrite as N	0.203	0.164	21%
pH	6.04	5.51	9%
Phosphorus	0.024	0.017	34%
Potassium			
Dissolved	0.96	-0.5	63%
Total Recoverable	0.92	-0.5	59%
Selenium			
Dissolved	-0.003	-0.003	0%
Total Recoverable	-0.003	-0.003	0%
Silicon			
Dissolved	12.8	8.1	45%
Total Recoverable	13.7	7.94	53%
Silver			
Dissolved	-0.0001	-0.0001	0%
Total Recoverable	-0.0001	-0.0001	0%
Sodium			
Dissolved	16.4	3.88	123%
Total Recoverable	16.6	3.88	124%
Specific conductance	86.6	45	63%
Sulfate as SO4	10.5	0.95	167%
Thallium			
Dissolved	-0.001	-0.001	0%
Total Recoverable	-0.001	-0.001	0%
Titanium			
Dissolved	-0.005	-0.005	0%
Total Recoverable	-0.005	-0.005	0%
Total Alkalinity	24.8	11.3	75%
Total Diss. Solids	40	24	50%
Total Susp. Solids	16	-10	46%
Turbidity	5.53	1.03	137%
Uranium			
Dissolved	-0.001	-0.001	0%
Total Recoverable	-0.001	-0.001	0%

Analyte	DUP-100	TSF-TW-2R	RPD
Vanadium			
Dissolved	-0.005	-0.005	0%
Total Recoverable	-0.005	-0.005	0%
Zinc			
Dissolved	0.0369	0.61	-177%
Total Recoverable	0.0885	0.63	-151%

- Charge Balance: C/A balance is less than 10% for all samples – PASS
- Blank Samples: There were no field blanks. There were no analytes detected in the lab blanks.
- Laboratory vs. Field Analyses: Field and Lab pH and conductivity measurements were close for most samples. The pH was off for TSF-PZ-2 and TSF-TW-3. The conductivity was off for Dup-100 (but not the duplicate for this sample) and M2-PZ-1-TW. The lab calculated TDS were off from the measured values for all samples except TSF-PZ-2.

sample ID	Field pH	Lab pH	Ratio	Field Cond.	Lab Cond.	Ratio	Lab Meas. TDS	Lab Calc. TDS	Ratio
DUP-100	NM	6.04	NM	46.5	86.6	60%	40	84	71%
TSF-TW-2R	NM	5.51	NM	46.5	45.0	-3%	24	42	55%
M2-PZ-1-TW	6.74	7.6	12%	262.7	384	38%	200	263	27%
MA-PZ-1-TW	6.78	7.25	7%	387	370	-4%	222	282	24%
MA-TW-6	7.41	7.72	4%	460	449	-2%	226	292	25%
TSF-MW-1	6.63	7.41	11%	259.8	265	2%	114	186	48%
TSF-PZ-2	2.45	5.86	82%	86.4	84	-3%	92	85	-8%
TSF-PZ-7	7.71	7.11	-8%	222.6	230	3%	132	218	49%
TSF-TW-3	7.87	6.45	-20%	96.6	95.9	-1%	60	118	65%
TSF-TW-5	6.09	6.75	10%	182.4	181	-1%	128	162	23%

All Field Sample data copied from Field Forms:

Sample #	Water Temp (°C)	Conductivity (µS/cm)	Turbidity (NTU)	pH	Dissolved Oxygen (mg/L)	ORP (mV)
DUP-100	NM	46.5	7.56	NM	34.2	425
TSF-TW-2R	NM	46.5	7.56	NM	34.2	425
M2-PZ-1-TW	NM	262.7	6.24	6.74	28.2	156.5
MA-PZ-1-TW	NM	387	1.08	6.78	9.7	157.5
MA-TW-6	NM	460	9.09	7.41	7.2	673
TSF-MW-1	NM	259.8	2.78	6.63	1.25	228.0
TSF-PZ-2	NM	86.4	8	2.45	71.1	422.8
TSF-PZ-7	NM	222.6	1.35	7.71	19.2	178.2
TSF-TW-3	NM	96.6	NM	7.87	15.0	465.5
TSF-TW-5	NM	182.4	6.21	6.09	82.6	234.3

NM = Not measured/recorded on field forms

- Comparison of Total and Dissolved Metal Analyses: Generally, given some measurement uncertainty, an RPD of greater than 20% will be considered unacceptable when dissolved concentrations are greater than total. Following is a list of samples and analytes with an RPD where the dissolved concentration was greater than total concentration of an analyte. Only manganese and nickel in sample TSF-TW-2R had an RPD > 20%.

Analyte	Dissolved	Total Recoverable	RPD	Notes
DUP-100				
Potassium	0.96	0.92	4%	Pass
M2-PZ-1-TW				
Barium	0.153	0.13	16%	Pass
Calcium	38.6	34	13%	Pass
Magnesium	17.2	15.7	9%	Pass
Manganese	1.13	1.04	8%	Pass
Silicon	21.2	20	6%	Pass
Sodium	22	21.4	3%	Pass
MA-PZ-1-TW				
Barium	0.028	0.027	4%	Pass
Calcium	31.8	31.1	2%	Pass
Iron	0.991	0.886	11%	Pass
Magnesium	17.2	16.8	2%	Pass
Manganese	0.714	0.67	6%	Pass
Potassium	0.87	0.83	5%	Pass
Silicon	30.6	30.2	1%	Pass
MA-TW-6				
Calcium	29.5	29.4	0%	Pass
Manganese	0.622	0.562	10%	Pass
TSF-MW-1				
Barium	0.0699	0.065	7%	Pass
Calcium	21.4	20.7	3%	Pass
Iron	1.31	1.3	1%	Pass
Magnesium	7.91	7.57	4%	Pass
Manganese	0.86	0.765	12%	Pass
Potassium	0.65	0.55	17%	Pass
Silicon	17.2	17.1	1%	Pass
Zinc	0.0157	0.015	6%	Pass
TSF-PZ-2				
Potassium	0.97	0.95	2%	Pass
TSF-PZ-7				
Barium	0.0261	0.026	2%	Pass
Calcium	15.1	14.7	3%	Pass
Iron	1.18	1.16	2%	Pass

Analyte	Dissolved	Total Recoverable	RPD	Notes
Magnesium	8.41	8.08	4%	Pass
Manganese	0.563	0.522	8%	Pass
Potassium	0.77	0.73	5%	Pass
Silicon	35.9	35.2	2%	Pass
TSF-TW-2R				
Calcium	0.919	0.854	7%	Pass
Copper	0.0012	-0	18%	Pass
Magnesium	2.03	1.94	5%	Pass
Manganese	0.0227	0.018	22%	Fail
Nickel	0.016	0.011	37%	Fail
Silicon	8.1	7.94	2%	Pass
TSF-TW-5				
Arsenic	0.0032	0.003	3%	Pass
Potassium	1.11	1.08	3%	Pass

- Inter-laboratory Comparison: results from University of Suriname laboratory have not yet been received for comparison of orthophosphate, TDS, and TSS

Summary:

	DUP-100	M2-PZ-1-TW	MA-PZ-1-TW	MA-TW-6	TSF-MW-1	TSF-PZ-2	TSF-PZ-7	TSF-TW-2R	TSF-TW-3	TSF-TW-5
Assessment of Completeness	●	●	●	●	●	●	●	●	●	●
Assessment of Holding Times ¹	○	○	○	○	○	○	○	○	○	○
Field Duplicate Sample Evaluation ²	○	NA	NA	NA	NA	NA	NA	○	NA	NA
Charge Balance Errors	●	●	●	●	●	●	●	●	●	●
Blank samples	●	●	●	●	●	●	●	●	●	●
Laboratory vs. Field Analyses ³	○	○	○	○	○	○	○	○	○	○
Comparison of Total and Dissolved ⁶	●	●	●	●	●	●	●	●	●	●
Inter-Laboratory Comparison	X	X	X	X	X	X	X	X	X	X

● = data OK, ○ = minor issue, see note, X = could not evaluate, NA = not applicable

Notes:

1 - All samples of TDS/TSS were analyzed past the recommended holding time.

2 – The RPD was > 20% for: Aluminum, Barium, Bicarbonate, Calcium, Hardness, Iron, Magnesium, Manganese (total only), Nickel (dissolved only), Nitrate, Phosphorus, Potassium, Silicon, Sodium, Specific conductance, Sulfate, Total alkalinity, TDS, TSS, Turbidity, Zinc.

3 - The pH was off for TSF-PZ-2 and TSF-TW-3. The conductivity was off for Dup-100 (but not the duplicate for this sample) and M2-PZ-1-TW. The lab calculated TDS were off from the measured values for all samples except TSF-PZ-2.



TECHNICAL MEMORANDUM

Date: 6 April 2012

Project No.: 113-93245

To: File

Company:

From: Jeremy Clark

cc:

Email:

RE: DATA VALIDATION FOR SVL DATA PACKAGE W2C0061

Following is a summary of Golder's data validation review of SVL data package W2C0061 for ten ground water samples:

- 24FEB12GW001 (TSF-MW-1)
- 25FEB12GW002 (MA-PZ1-TW1)
- 25FEB12GW003 (TSF-PZ-7)
- 26FEB12GW004 (TSF-TW-2R)
- 26FEB12GW005 (TSF-TW-2)
- 26FEB12GW006 (TSF-TW-5)
- 27FEB12GW007 (TSF-TW-3)
- 27FEB12GW008 (MA-TW-6)
- 28FEB12GW009 (M2-PZ1-TW1)
- 28FEB12GW109 (field duplicate of M2-MZ1-TW1)

The following data validation elements were described in the surface and ground water sampling SAP:

- Assessment of Completeness: PASS

COC Requested Analysis for GW	Analyzed
Dissolved Metals + Hg	Yes
Total Metals + Hg	Yes
TDS, TSS, pH,	Yes
Anions/Alkalinity/Sulfate	Yes
NO ₂ /NO ₃ /Ammonia/Phos./COD	Yes
Cyanide (WAD, Free, Total)	Yes
Also: Conductivity, Turbidity	Yes

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■ Assessment of Holding Times:

Parameter	Analysis Method	Holding Time (days)	Analysis (days post collection)	Note
TDS/TSS	SM 25470 C/D	7	6-10	Pass, Fail for 8 samples
Alkalinity	SM 2320B/2310B	14	7-11	Pass
Hardness	SM 2340B	28	21-25	Pass
Mercury (total, dissolved)	245.1	28	12-17	Pass
Metals (total)	200.7	180	13-24	Pass
Metals (dissolved)	200.7	180	15-25	Pass
Metals (total), Sb, As, Se, Tl, U	200.8	180	13-17	Pass
Metals (dissolved) , Sb, As, Se, Tl	200.8	180	15-19	Pass
Cyanide (WAD/free/total)	SM 4500/ASTM D7237/ EPA 335.4	14	8-14	Pass
Anions (Cl, F, SO ₄)	300.0	28	13-17	Pass
Ammonia, Nitrate/Nitrite	350.1, 353.2	28	20-24	Pass
Phosphorus, Total	SM 4500-P-E	28	9-13	Pass
Specific Conductance	120.1	28	6-10	Pass
Turbidity	180.1	2	7-11	Fail
pH	SM 4500 H B	<1	7-11	Fail

- Field Duplicate Sample Evaluation: Sample 28FEB12GW009 and 28FEB12GW109 were field duplicates. The following table shows the lab values and RPD for each analyte. All measured values were < 20 % different. PASS

Analyte	28FEB12GW009	28FEB12GW109	RPD
Aluminum	0.277	0.283	
Dissolved	-0.08	-0.08	0%
Total Recoverable	0.357	0.363	-2%
Ammonia as N	0.035	-0.03	15%
Antimony			
Dissolved	-0.003	-0.003	0%
Total Recoverable	-0.003	-0.003	0%
Arsenic			
Dissolved	-0.003	-0.003	0%
Total Recoverable	-0.003	-0.003	0%
Barium			
Dissolved	0.161	0.162	-1%
Total Recoverable	0.175	0.174	1%
Beryllium			

Analyte	28FEB12GW009	28FEB12GW109	RPD
Dissolved	-0.0002	-0.0002	0%
Total Recoverable	-0.0004	-0.0004	0%
Bicarbonate	228	227	0%
Boron			
Dissolved	-0.04	-0.04	0%
Total Recoverable	-0.04	-0.04	0%
Cadmium			
Dissolved	-0.0002	-0.0002	0%
Total Recoverable	-0.0002	-0.0002	0%
Calcium			
Dissolved	39.6	39.7	0%
Total Recoverable	43.9	43.9	0%
Carbonate	-1	-1	0%
Chloride	4.86	4.83	1%
Chromium			
Dissolved	-0.006	-0.006	0%
Total Recoverable	-0.006	-0.006	0%
Cobalt			
Dissolved	-0.006	-0.006	0%
Total Recoverable	-0.006	-0.006	0%
Copper			
Dissolved	-0.001	-0.001	0%
Total Recoverable	0.00252	0.0022	14%
Cyanide (free)	-0.005	-0.005	0%
Cyanide (total)	-0.01	-0.01	0%
Cyanide (WAD)	-0.01	-0.01	0%
Fluoride	0.18	0.17	6%
Hardness (as CaCO3)	171	171	0%
Iron			
Dissolved	0.543	0.546	-1%
Total Recoverable	1.34	1.34	0%
Lead			
Dissolved	-0.003	-0.003	0%
Total Recoverable	-0.003	-0.003	0%
Magnesium			
Dissolved	17.5	17.5	0%
Total Recoverable	19.3	19.4	-1%
Manganese			
Dissolved	1.02	1.02	0%

Analyte	28FEB12GW009	28FEB12GW109	RPD
Total Recoverable	1.11	1.11	0%
Mercury			
Dissolved	-0.0002	-0.0002	0%
Total	-0.0002	-0.0002	0%
Molybdenum			
Dissolved	0.011	0.01	10%
Total Recoverable	0.008	0.008	0%
Nickel			
Dissolved	-0.01	-0.01	0%
Total Recoverable	-0.01	-0.01	0%
Nitrate/Nitrite as N	-0.05	-0.05	0%
pH	7.87	7.89	0%
Phosphorus			
Total	0.049	0.052	-6%
Potassium			
Dissolved	0.72	0.74	-3%
Total Recoverable	0.81	0.82	-1%
Selenium			
Dissolved	-0.003	-0.003	0%
Total Recoverable	-0.003	-0.003	0%
Silicon			
Dissolved	21	21.1	0%
Total Recoverable	22.5	22.7	-1%
Silver			
Dissolved	-0.0001	-0.0001	0%
Total Recoverable	-0.0001	-0.0001	0%
Sodium			
Dissolved	21.7	21.9	-1%
Total Recoverable	23	23.2	-1%
Specific conductance	413	416	-1%
Sulfate as SO4	1.24	1.12	10%
Thallium			
Dissolved	-0.001	-0.001	0%
Total Recoverable	-0.001	-0.001	0%
Titanium			
Dissolved	-0.005	-0.005	0%
Total Recoverable	-0.005	-0.005	0%
Total Alkalinity	228	227	0%
Total Diss. Solids	259	251	3%

Analyte	28FEB12GW009	28FEB12GW109	RPD
Total Susp. Solids	47	43	9%
Turbidity	18.5	17.8	4%
Uranium			
Dissolved	-0.001	-0.001	0%
Total Recoverable	-0.001	-0.001	0%
Vanadium			
Dissolved	-0.005	-0.005	0%
Total Recoverable	-0.005	-0.005	0%
Zinc			
Dissolved	-0.01	-0.01	0%
Total Recoverable	0.118	0.117	1%

- Charge Balance: C/A balance is less than 10% for all samples – PASS
- Blank Samples: There were no field blanks. There were no analytes detected in the lab blanks.
- Laboratory vs. Field Analyses: Field and Lab pH and conductivity measurements were close for most samples. The pH was off for 28Feb12GW009 (and hence –GW109). The conductivity was off for 24Feb12GW001, -GW002, and -GW009 (and -GW109). The lab calculated TDS were close from the measured values for all samples except 26Feb12GW004.

sample ID	Field pH	Lab pH	Ratio	Field Cond.	Lab Cond.	Ratio	Lab Meas. TDS	Lab Calc. TDS	Ratio
24FEB12GW001	6.52	7.72	17%	34.2	323	162%	208	217	0.96
25FEB12GW002	6.73	7.67	13%	3.73	363	196%	261	283	0.92
25FEB12GW003	6.32	7.26	14%	246.4	227	-8%	185	217	0.85
26FEB12GW004	5.31	6.08	14%	46.4	42.7	-8%	32	45	0.72
26FEB12GW005	5.35	6.23	15%	76.8	70.9	-8%	66	73	0.90
26FEB12GW006	6.26	7.07	12%	NM	170	NM	156	160	0.97
27FEB12GW007	6.04	7.06	16%	146.5	175	18%	140	143	0.98
27FEB12GW008	7.58	7.90	4%	400	434	8%	266	301	0.88
28FEB12GW009	5.66	7.87	33%	240.8	413	53%	259	285	0.91
28FEB12GW109	5.66	7.89	33%	240.8	416	53%	251	285	0.88

All Field Sample data copied from Field Forms:

Sample #	Water Temp (°C)	Conductivity (µS/cm)	Turbidity (NTU)	pH	Dissolved Oxygen (mg/L)	ORP (mV)
24FEB12GW001	27.3	34.2	3.33	6.52	18.9	112.5
25FEB12GW002	30	3.73	5.08	6.73	31.3	45.1
25FEB12GW003	25.7	246.4	3.61	6.32	32.1	0.7
26FEB12GW004	25.5	46.4	7.21	5.31	NM	332.8
26FEB12GW005	26.4	76.8	5.00	5.35	NM	180.5

26FEB12GW006	26.3	NM	74.7	6.26	71.3	16.0
27FEB12GW007	26	146.5	330	6.04	76.5	183.6
27FEB12GW008	25	400	6.85	7.58	15.8	30.5
28FEB12GW009	26.5	240.8	3.35	5.66	28.9	43.6
28FEB12GW109	26.5	240.8	3.35	5.66	28.9	43.6

NM = Not measured/recorded on field forms

- Comparison of Total and Dissolved Metal Analyses: Generally, given some measurement uncertainty, an RPD of greater than 20% will be considered unacceptable when dissolved concentrations are greater than total. Following is a list of samples and analytes with an RPD where the dissolved concentration was greater than total concentration of an analyte. Only manganese and nickel in sample TSF-TW-2R had an RPD > 20%.

Analyte	Dissolved	Total Recoverable	RPD	Notes
25FEB12GW002				
Barium	0.0276	0.0274	1%	Pass
Molybdenum	0.013	0.011	17%	Pass
Silicon	30.3	29.9	1%	Pass
26FEB12GW004				
Copper	0.00118	-0.001	17%	Pass
26FEB12GW006				
Barium	0.0186	0.0178	4%	Pass
Beryllium	-0.0002	-0.0004	-67%	Pass
27FEB12GW007				
Cobalt	0.0086	-0.006	36%	Fail
Molybdenum	0.01	-0.008	22%	Fail
27FEB12GW008				
Beryllium	-0.0002	-0.0004	-67%	Pass
Molybdenum	0.015	0.013	14%	Pass
28FEB12GW009				
Beryllium	-0.0002	-0.0004	-67%	Pass
Molybdenum	0.011	0.008	32%	Fail
28FEB12GW109				
Beryllium	-0.0002	-0.0004	-67%	Pass
Molybdenum	0.01	0.008	22%	Pass

- Inter-laboratory Comparison: results from University of Suriname laboratory have not yet been received for comparison of orthophosphate, TDS, and TSS

Summary:

	24FEB12GW001	25FEB12GW002	25FEB12GW003	26FEB12GW004	26FEB12GW005	26FEB12GW006	27FEB12GW007	27FEB12GW008	28FEB12GW009	28FEB12GW109
Assessment of Completeness	●	●	●	●	●	●	●	●	●	●
Assessment of Holding Times ¹	○	○	○	○	○	○	●	●	●	●
Field Duplicate Sample Evaluation	NA	NA	NA	NA	NA	NA	NA	NA	●	●
Charge Balance Errors	●	●	●	●	●	●	●	●	●	●
Blank samples	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Laboratory vs. Field Analyses ²	○	○	●	○	●	●	●	●	○	○
Comparison of Total and Dissolved ³	●	●	●	●	●	●	○	●	○	●
Inter-Laboratory Comparison	X	X	X	X	X	X	X	X	X	X

● = data OK, ○ = minor issue, see note, X = could not evaluate, NA = not applicable

Notes:

- 1 - All samples of turbidity and pH were analyzed past holding times. Six of the water samples were analyzed past the holding time for TDS/TSS.
- 2 - The pH was off for 28Feb12GW009 (and hence –GW109). The conductivity was off for 24Feb12GW001, -GW002, and -GW009 (and -GW109). The lab calculated TDS were close from the measured values for all samples except 26Feb12GW004.
- 3 - Cobalt and Molybdenum were detected in the dissolved fraction, but not the Total.



TECHNICAL MEMORANDUM

Date: 13 April 2012

Project No.: 113-93245

To: File

Company:

From: Jeremy Clark

cc:

Email:

RE: DATA VALIDATION FOR SVL DATA PACKAGE W2C0178

Following is a summary of Golder's data validation review of SVL data package W2C0204 for 6 surface water samples:

- 02MAR12SW002 (SW-21)
- 02MAR12SW001 (SW-13)
- 02MAR12SW003 (SW-26)
- 02MAR12SW004 (SW-32)
- 03MAR12SW006 (SW-15)
- 03MAR12SW005 (SW-23)

The following data validation elements were described in the surface and ground water sampling SAP:

- Assessment of Completeness: PASS

COC Requested Analysis for SW	Analyzed
Dissolved Metals + Hg	Yes
Total Metals + Hg	Yes
TDS, TSS, pH	Yes
Anions/Alkalinity/Sulfate	Yes
NO2/NO3/Ammonia/Phos./COD	Yes
Cyanide (WAD, Free, Total)	Yes
TOC	Yes
Oil and Grease	No- by Anatek labs (4/13 waiting for data package)
Also: Conductivity, Turbidity	Yes

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■ Assessment of Holding Times:

Parameter	Analysis Method	Holdin g Time (days)	Analysis (days post collection)	Note
TDS/TSS	SM 2540 C/D	7	6-10	Pass, Fail for SW-003
Alkalinity	SM 2320B/2310B	14	11-12	Pass
Hardness	SM 2340B	28	20-21	Pass
Mercury (total, dissolved)	245.1	28	11-13	Pass
Metals (total)	200.7	180	20-21	Pass
Metals (dissolved)	200.7	180	22-23	Pass
Metals (total), Sb, As, Se, Tl, U	200.8	180	12-13	Pass
Metals (dissolved) , Sb, As, Se, Tl	200.8	180	17-18	Pass
Cyanide (WAD/free/total)	SM 4500/ASTM D7237/ EPA 335.4	14	12-13	Pass
Anions (Cl, Fl, SO4)	300.0	28	13-14	Pass
Ammonia, Nitrate/Nitrite	350.1, 353.2	28	16-21	Pass
Phosphorus, Total	SM 4500-P-E	28	12-13	Pass
Specific Conductance	120.1	28	6-7	Pass
Turbidity	180.1	2	9-10	Fail
pH	SM 4500 H B	<1	11-12	Fail
Total Organic Carbon	SM 5310B	28	16-17	Pass
Chemical Oxygen Demand	410.4	28	10-11	Pass
Hexane Extractable Material (Oil and Grease)	1664A	28		

■ Field Duplicate Sample Evaluation: No field duplicates were collected.

■ Charge Balance: C/A balance was 12.74% for 02MAR2012SW002, 15.48% for 02MAR2010SW003, 15.7% for 02MAR2012SW004, 16.56% for 03MAR2012SW006, 13.53% for 03MAR2012SW005, and was less than 10% for the rest of the samples (-SW001) – PASS/FAIL

■ Blank Samples: There were no analytes detected in the lab blanks. No field blank was collected.

- Laboratory vs. Field Analyses: Field and Lab conductivity measurements were close for all of these samples. However, the pH and lab measured versus calculated TDS was off for just about all the samples.

sample ID	Field pH	Lab pH	Ratio	Field Cond.	Lab Cond.	Ratio	Lab Meas. TDS	Lab Calc. TDS	Ratio
02MAR2012SW001	4.86	6.44	0.75	25.81	26.8	0.96	34	20	1.70
02MAR2012SW002	4.92	6.44	0.76	27.79	28.6	0.97	51	21	2.43
02MAR2012SW003	5.19	6.48	0.80	35.6	35.2	1.01	39	26	1.50
02MAR2012SW004	5.25	6.42	0.82	37.1	35	1.06	62	26	2.38
03MAR2012SW005	4.24	6.55	0.65	50.5	49.4	1.02	32	30	1.07
03MAR2012SW006	4.69	6.36	0.74	27.04	30.4	0.89	39	22	1.77

All Field Sample data copied from Field Forms:

Sample #	Water Temp (°C)	Conductivity (µS/cm)	Turbidity (NTU)	Chlorophyll (ppm)	pH	Dissolved Oxygen (mg/L)	ORP (mV)
02MAR2012SW001	25	25.81	182	-99.9	4.86	84.0	NM
02MAR2012SW002	25	27.79	74	-99.9	4.92	6.6	NM
02MAR2012SW003	33.6	35.6	899	15.4	5.19	6.91	214.4
02MAR2012SW004	30.7	37.1	1044	16.6	5.25	6.37	123.9
03MAR2012SW005	25	50.5	109	3.8	4.24	6.56	303.4
03MAR2012SW006	28.7	27.04	71.7	6.0	4.69	6.58	304.7

NM = Not measured/recorded on field forms

NA = Not applicable

- Comparison of Total and Dissolved Metal Analyses: All 6 SW samples had total metal concentrations greater than dissolved metal concentrations. PASS
- Inter-laboratory Comparison: results from University of Surname laboratory have not yet been received for comparison of orthophosphate, TDS, and TSS.

Summary:

	02MAR2012SW001	02MAR2012SW002	02MAR2012SW003	02MAR2012SW004	03MAR2012SW005	03MAR2012SW006
Assessment of Completeness	●	●	●	●	●	●
Assessment of Holding Times ¹	○	○	○	○	○	○
Field Duplicate Sample Evaluation ⁴	NA	NA	NA	NA	NA	NA
Charge Balance Errors	●	○	○	○	○	○
Blank samples	NA	NA	NA	NA	NA	NA
Laboratory vs. Field Analyses ²	○	○	○	○	○	○
Comparison of Total and Dissolved	●	●	●	●	●	●
Inter-Laboratory Comparison	X	X	X	X	X	X

● = data OK, ○ = minor issue, see note, X = could not evaluate, NA = not applicable

Notes:

- 1 - All samples of turbidity, pH, and TDS/TSS (only for -SW003) were analyzed past holding times.
- 2 - pH measured in the field and lab was off by > 20% for all samples except -SW003 AND -SW004. Lab measures versus calculated TDS was >20% different for all samples except -SW005.



TECHNICAL MEMORANDUM

Date: 6 April 2012

Project No.: 113-93245

To: File

Company:

From: Jeremy Clark

cc:

Email:

RE: DATA VALIDATION FOR SVL DATA PACKAGE W2C0204

Following is a summary of Golder's data validation review of SVL data package W2C0204 for 12 surface water samples:

- 03MAR12SW005 (SW-23)
- 04MAR12SW007 (SW-28)
- 04MAR12SW008 (SW-30)
- 04MAR12SW009 (SW-38)
- 04MAR12SW010 (SW-35)
- 04MAR12SW011 (SW-37)
- 05MAR12SW012 (SW-31)
- 05MAR12SW013 (SW-4B)
- 05MAR12SW014 (SW-34)
- 05MAR12SW015 (SW-04A)
- 05MAR12SW113 (Field duplicate)
- 05MAR12SW201 (Field blank)

The following data validation elements were described in the surface and ground water sampling SAP:

- Assessment of Completeness: PASS

COC Requested Analysis for SW	Analyzed
Dissolved Metals + Hg	Yes
Total Metals + Hg	Yes
TDS, TSS, pH	Yes
Anions/Alkalinity/Sulfate	Yes
NO2/NO3/Ammonia/Phos./COD	Yes
Cyanide (WAD, Free, Total)	Yes
Oil and Grease	Yes- by Antek labs
Also: Conductivity, Turbidity, TOC	Yes

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■ Assessment of Holding Times:

Parameter	Analysis Method	Holding Time (days)	Analysis (days post collection)	Note
TDS/TSS	SM 2540 C/D	7	9-11	Fail
Alkalinity	SM 2320B/2310B	14	10-12	Pass
Hardness	SM 2340B	28	22-24	Pass
Mercury (total, dissolved)	245.1	28	14-16	Pass
Metals (total)	200.7	180	22-24	Pass
Metals (dissolved)	200.7	180	22-24	Pass
Metals (total), Sb, As, Se, Tl, U	200.8	180	16-18	Pass
Metals (dissolved) , Sb, As, Se, Tl	200.8	180	16-18	Pass
Cyanide (WAD/free/total)	SM 4500/ASTM D7237/ EPA 335.4	14	10-12	Pass
Anions (Cl, F, SO ₄)	300.0	28	15-17	Pass
Ammonia, Nitrate/Nitrite	350.1, 353.2	28	17-20	Pass
Phosphorus, Total	SM 4500-P-E	28	14-16	Pass
Specific Conductance	120.1	28	9-11	Pass
Turbidity	180.1	2	8-10	Fail
pH	SM 4500 H B	<1	10-12	Fail
Total Organic Carbon	SM 5310B	28	14-16	Pass
Chemical Oxygen Demand	410.4	28	11-13	Pass
Hexane Extractable Material (Oil and Grease)	1664A	28	18-20	Pass

- Field Duplicate Sample Evaluation: Sample 05MAR2012SW013 and 05MAR2012SW113 were field duplicates. The following table shows the lab values and RPD for each analyte. All measured values were < 20 % different except for: hexane extractable material, dissolved iron, dissolved magnesium, and TDS.

Analyte	05MAR2012SW013	05MAR2012SW113	RPD
Aluminum			
Dissolved	0.097	0.083	15.6%
Total Recoverable	51.2	50.2	2.0%
Ammonia as N	0.78	0.652	17.9%
Antimony			
Dissolved	-0.003	-0.003	0.0%
Total Recoverable	-0.003	-0.003	0.0%
Arsenic			
Dissolved	-0.003	-0.003	0.0%
Total Recoverable	0.0041	0.0041	0.0%

Analyte	05MAR2012SW013	05MAR2012SW113	RPD
Barium			
Dissolved	-0.002	-0.002	0.0%
Total Recoverable	0.139	0.137	1.4%
Beryllium			
Dissolved	-0.002	-0.002	0.0%
Total Recoverable	-0.002	-0.002	0.0%
Bicarbonate	1.9	1.8	5.4%
Boron			
Dissolved	-0.04	-0.04	0.0%
Total Recoverable	-0.04	-0.04	0.0%
Cadmium			
Dissolved	-0.002	-0.002	0.0%
Total Recoverable	-0.002	-0.002	0.0%
Calcium			
Dissolved	0.205	0.178	14.1%
Total Recoverable	1.5	1.5	0.0%
Carbonate	-1	-1	0.0%
Chemical Oxygen Demand	70.2	64.4	8.6%
Chloride	3.92	3.87	1.3%
Chromium			
Dissolved	-0.006	-0.006	0.0%
Total Recoverable	0.266	0.252	5.4%
Cobalt			
Dissolved	-0.006	-0.006	0.0%
Total Recoverable	0.0133	0.0127	4.6%
Copper			
Dissolved	-0.01	-0.01	0.0%
Total Recoverable	0.219	0.211	3.7%
Cyanide (free)	-0.005	-0.005	0.0%
Cyanide (total)	-0.01	-0.01	0.0%
Cyanide (WAD)	-0.01	-0.01	0.0%
Fluoride	-0.1	-0.1	0.0%
Hardness(as CaCO3)	12.4	12.2	1.6%
Hexane extractable material (HEM)	3.3	-1	107.0%
Iron			
Dissolved	0.495	0.36	31.6%
Total Recoverable	75.8	71.5	5.8%
Lead			
Dissolved	-0.0075	-0.0075	0.0%

Analyte	05MAR2012SW013	05MAR2012SW113	RPD
Total Recoverable	0.0624	0.0596	4.6%
Magnesium			
Dissolved	0.169	0.125	29.9%
Total Recoverable	2.11	2.04	3.4%
Manganese			
Dissolved	0.0335	0.0302	10.4%
Total Recoverable	0.365	0.358	1.9%
Mercury			
Dissolved	-0.0002	-0.0002	0.0%
Total	0.00023	-0.0002	14.0%
Molybdenum			
Dissolved	-0.008	-0.008	0.0%
Total Recoverable	-0.008	-0.008	0.0%
Nickel			
Dissolved	-0.01	-0.01	0.0%
Total Recoverable	0.073	0.068	7.1%
Nitrate/Nitrite as N	0.076	0.078	-2.6%
pH	5.61	5.6	0.2%
Phosphorus	0.818	0.788	3.7%
Potassium			
Dissolved	0.53	0.52	1.9%
Total Recoverable	1.9	1.88	1.1%
Selenium			
Dissolved	-0.003	-0.003	0.0%
Total Recoverable	-0.003	-0.003	0.0%
Silicon			
Dissolved	2.93	2.86	2.4%
Total Recoverable	36.3	35.5	2.2%
Silver			
Dissolved	-0.005	-0.005	0.0%
Total Recoverable	-0.005	-0.005	0.0%
Sodium			
Dissolved	2.62	2.58	1.5%
Total Recoverable	2.85	2.89	-1.4%
Specific conductance	23	24.1	-4.7%
Sulfate as SO4	1.81	1.83	-1.1%
Thallium			
Dissolved	-0.001	-0.001	0.0%
Total Recoverable	-0.001	-0.001	0.0%

Analyte	05MAR2012SW013	05MAR2012SW113	RPD
Titanium			
Dissolved	-0.005	-0.005	0.0%
Total Recoverable	0.0216	0.0201	7.2%
Total Alkalinity	1.9	1.8	5.4%
Total Diss. Solids	184	120	42.1%
Total Organic Carbon	14.4	16.4	-13.0%
Total Susp. Solids	5910	5780	2.2%
Turbidity	6340	5820	8.6%
Uranium			
Dissolved	-0.001	-0.001	0.0%
Total Recoverable	0.00437	0.00402	8.3%
Vanadium			
Dissolved	-0.005	-0.005	0.0%
Total Recoverable	0.138	0.133	3.7%
Zinc			
Dissolved	-0.01	-0.01	0.0%
Total Recoverable	0.107	0.103	3.8%

- Charge Balance: C/A balance was 14.3% for 04MAR2012SW007, 12.3% for 04MAR2010SW009, 11.42% for 04MAR2012SW010, 11.86% for 04MAR2012SW011, 10.32% for 05MAR2012SW013, 10.41% for 05MAR2012SW014, 11.43% for 05MAR2012SW015, 12.74% for 03MAR2012SW005, and is less than 10% for the rest of the samples – PASS/FAIL
- Blank Samples: There were no analytes detected in the lab blanks. Sample 05MAR2012SW201 was a field blank. Following were the analytes detected in the field blank:

Method	Analyte	Result	Units	RL	MDL
EPA 200.7	Sodium (total recoverable)	0.74	mg/L	0.50	0.02
EPA 200.7	Silicon (dissolved)	0.08	mg/L	0.08	0.03
EPA 120.1	Specific conductance	7.60	umhos/cm	5	--
EPA 180.1	Turbidity	0.454	NTU	0.1	--
EPA 353.2	Nitrate/Nitrite as N	0.110	mg/L	0.05	0.009
SM2540 D	TSS	5.0	mg/L	5.0	--
SM 4500 HB	pH	4.9	pH units		
EPA 300.0	Chloride	0.54	mg/L	0.20	0.07
EPA 300.0	Sulfate as SO4	0.75	mg/L	0.30	0.04

- Laboratory vs. Field Analyses: Field and Lab conductivity measurements were close for all of these samples. However, the pH and lab measured versus calculated TDS was off for just about all the samples.

sample ID	Field pH	Lab pH	Ratio	Field Cond.	Lab Cond.	Ratio	Lab Meas. TDS	Lab Calc. TDS	Ratio
03MAR2012SW005	4.24	6.48	0.65	50.5	48.4	1.04	76	30	2.55
04MAR2012SW007	3.62	5.37	0.67	21.96	22.4	0.98	19	18	1.04
04MAR2012SW008	4.45	6.18	0.72	23.63	24.4	0.97	84	30	2.8
04MAR2012SW009	4.61	6.33	0.73	27.04	27.8	0.97	62	22	2.79
04MAR2012SW010	4.65	6.53	0.71	30	31.3	0.96	47	25	1.9
04MAR2012SW011	4.50	6.39	0.70	28.88	30.3	0.95	41	24	1.73
05MAR2012SW012	5.96	6.52	0.91	41.9	43.7	0.96	70	31	2.26
05MAR2012SW013	4.25	5.61	0.76	24.2	23	1.05	184	66	2.78
05MAR2012SW014	4.56	6.48	0.70	33.9	34	1.00	54	28	1.94
05MAR2012SW015	4.60	6.43	0.72	32.4	32.7	0.99	50	36	1.4
05MAR2012SW113	4.25	5.60	0.76	24.2	24.1	1.00	120	65	1.85
05MAR2012SW201	NA	4.90	NA	NA	7.60	NA	<10	NM	NA

All Field Sample data copied from Field Forms:

Sample #	Water Temp (°C)	Conductivity (µS/cm)	Turbidity (NTU)	Chlorophyll (ppm)	pH	Dissolved Oxygen (mg/L)	ORP (mV)
03MAR2012SW005	25	50.5	109	3.8	4.24	6.56	303.4
04MAR2012SW007	23.1	21.96	2.68	0.8	3.62	5.16	4343
04MAR2012SW008	24.2	23.63	664	17.3	4.45	6.18	360.1
04MAR2012SW009	26.9	27.04	68.6	2.6	4.61	6.2	309.4
04MAR2012SW010	26	30	62.3	2.5	4.65	6.17	310.3
04MAR2012SW011	25	28.88	24.1	1.2	4.50	6.42	321.3
05MAR2012SW012	26.1	41.9	377	9.6	5.96	6.11	13.5
05MAR2012SW013	25	24.2	5960	40.6	4.25	6.47	46.9
05MAR2012SW014	31.71	33.9	188	6.4	4.56	6.35	44.5
05MAR2012SW015	25	32.4	685	15.4	4.60	6.77	44.7
05MAR2012SW113	25	24.2	5960	40.6	4.25	6.47	46.9
05MAR2012SW201	NA	NA	NA	NA	NA	NA	NA

NM = Not measured/recorded on field forms

NA = Not applicable

- Comparison of Total and Dissolved Metal Analyses: Generally, given some measurement uncertainty, an RPD of greater than 20% will be considered unacceptable when dissolved concentrations are greater than total. Following is a list of samples and analytes with an RPD where the dissolved concentration was greater than total concentration of an analyte. All samples had an RPD < 20%.

Analyte	Dissolved	Total Recoverable	RPD	Notes
03MAR2012SW005				
04MAR2012SW007				
Calcium	0.201	0.173	15.0%	Pass
Manganese	0.0159	0.0149	6.5%	Pass
Silicon	3.85	3.82	0.8%	Pass
04MAR2012SW008				
04MAR2012SW009				
04MAR2012SW010				
04MAR2012SW011				
Calcium	1.06	1.05	0.9%	Pass
05MAR2012SW012				
05MAR2012SW014				
05MAR2012SW015				
05MAR2012SW113				
05MAR2012SW201				
Silicon	0.08	-0.08	0.0%	Pass

- Inter-laboratory Comparison: results from University of Surname laboratory have not yet been received for comparison of orthophosphate, TDS, and TSS

Summary:

	03MAR2012SW005	04MAR2012SW007	04MAR2012SW008	04MAR2012SW009	04MAR2012SW010	04MAR2012SW011	05MAR2012SW012	05MAR2012SW013	05MAR2012SW014	05MAR2012SW015	05MAR2012SW113	05MAR2012SW201
Assessment of Completeness	●	●	●	●	●	●	●	●	●	●	●	●
Assessment of Holding Times ¹	○	○	○	○	○	○	○	○	○	○	○	○
Field Duplicate Sample Evaluation ⁴	NA	NA	NA	NA	NA	NA	NA	○	NA	NA	○	NA
Charge Balance Errors	○	○	●	○	○	○	●	○	○	○	●	NA
Blank samples ²	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	○
Laboratory vs. Field Analyses ³	○	○	○	○	○	○	○	○	○	○	○	NA
Comparison of Total and Dissolved	●	●	●	●	●	●	●	●	●	●	●	●
Inter-Laboratory Comparison	X	X	X	X	X	X	X	X	X	X	X	X

● = data OK, ○ = minor issue, see note, X = could not evaluate, NA = not applicable

Notes:

- 1 - All samples of turbidity, TDS/TSS, and pH were analyzed past holding times.
- 2 - Small detections above the RL in the field blank were: Sodium (total), silicon (dissolved), conductance, turbidity, nitrate/nitrite, TSS, chloride, Sulfate as SO₄.
- 3 - pH measured in the field and lab was off by > 20% for all samples except -SW012. Lab measures versus calculated TDS was >20% different for all samples except -SW007.
- 4 - The following parameters were >20% different between the field duplicate samples: hexane extractable material, dissolved iron, dissolved magnesium, and TDS



TECHNICAL MEMORANDUM

Date: 16 July 2012

Project No.: 113-93245

To: File

Company:

From: Jeremy Clark

cc:

Email:

RE: DATA VALIDATION FOR SVL DATA PACKAGE W2D0302

Following is a summary of Golder's data validation review of SVL data package W2D0302 for 11 ground water samples:

- 27MAR12GW001
- 27MAR12GW002
- 27MAR12GW003
- 28MAR12GW004
- 28MAR12GW005
- 28MAR12GW006
- 29MAR12GW007
- 29MAR12GW107 (duplicate of 29MAR12GW007)
- 29MAR12GW008
- 30MAR12GW009
- NADD1298GW001

The following data validation elements were described in the surface and ground water sampling SAP:

- Assessment of Completeness: PASS

COC Requested Analysis for SW	Analyzed
Dissolved Metals + Hg	Yes
Total Metals + Hg	Yes
TDS, TSS, pH	Yes
Anions/Alkalinity/Sulfate	Yes
NO2/NO3/Ammonia/Phos./COD	Yes, NO COD measured
Cyanide (WAD, Free, Total)	Yes
TOC (for NADD... sample only)	Yes
Also: Conductivity, Turbidity	Yes

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■ Assessment of Holding Times:

Parameter	Analysis Method	Holding Time (days)	Analysis (days post collection)	Note
TDS/TSS	SM 2540 C/D	7	18-21	Fail
Alkalinity	SM 2320B/2310B	14	20-23	Fail
Hardness	SM 2340B	28	31-34	Fail
Mercury (total, dissolved)	245.1	28	24-27	Pass
Metals (total)	200.7	180	33-36	Pass
Metals (dissolved)	200.7	180	33-36	Pass
Metals (total), Sb, As, Se, Tl, U	200.8	180	31-34	Pass
Metals (dissolved) , Sb, As, Se, Tl	200.8	180	31-34	Pass
Cyanide (WAD/free/total)	SM 4500/ASTM D7237/ EPA 335.4	14	19-23	Fail
Anions (Cl, F, SO ₄)	300.0	28	24-27	Pass
Ammonia, Nitrate/Nitrite	350.1, 353.2	28	24-28	Pass
Phosphorus, Total	SM 4500-P-E	28	21-24	Pass
Specific Conductance	120.1	28	18-21	Pass
Turbidity	180.1	2	18-21	Fail
pH	SM 4500 H B	<1	20-23	Fail
Total Organic Carbon	SM 5310B	28	23	Pass

- Field Duplicate Sample Evaluation: Samples 29MAR2012GW007 and 29MAR2012GW107 were field duplicates. The following table shows the lab values and RPD for each analyte. All measured values were < 20 % different except for total recoverable zinc.

Analyte	29MAR12GW007	29MAR12GW107	RPD
Aluminum			
Dissolved	< 0.08	< 0.08	0.0%
Total Recoverable	< 0.08	< 0.08	0.0%
Ammonia as N	< 0.03	< 0.03	0.0%
Antimony			
Dissolved	< 0.003	< 0.003	0.0%
Total Recoverable	< 0.003	< 0.003	0.0%
Arsenic			
Dissolved	< 0.003	< 0.003	0.0%
Total Recoverable	< 0.003	< 0.003	0.0%
Barium			
Dissolved	0.164	0.165	-0.6%
Total Recoverable	0.156	0.153	1.9%
Beryllium			

Analyte	29MAR12GW007	29MAR12GW107	RPD
Dissolved	< 0.00128	< 0.00256	-66.7% (<DL)
Total Recoverable	< 0.0004	< 0.0004	0.0%
Bicarbonate	226	223	1.3%
Boron			
Dissolved	< 0.04	< 0.04	0.0%
Total Recoverable	< 0.04	< 0.04	0.0%
Cadmium			
Dissolved	< 0.0002	< 0.0002	0.0%
Total Recoverable	< 0.0002	< 0.0002	0.0%
Calcium			
Dissolved	40.7	40.9	-0.5%
Total Recoverable	41.6	40.9	1.7%
Carbonate	< 1	< 1	0.0%
Chloride	5.05	5.05	0.0%
Chromium			
Dissolved	< 0.006	< 0.006	0.0%
Total Recoverable	< 0.006	< 0.006	0.0%
Cobalt			
Dissolved	< 0.006	< 0.006	0.0%
Total Recoverable	< 0.006	< 0.006	0.0%
Copper			
Dissolved	< 0.001	< 0.001	0.0%
Total Recoverable	< 0.001	< 0.001	0.0%
Cyanide (free)	< 0.005	< 0.005	0.0%
Cyanide (total)	< 0.01	< 0.01	0.0%
Cyanide (WAD)	< 0.01	< 0.01	0.0%
Fluoride	0.1	< 0.1	0.0%
Hardness (as CaCO3)	177	179	-1.1%
Iron			
Dissolved	0.703	0.713	-1.4%
Total Recoverable	0.795	0.757	4.9%
Lead			
Dissolved	< 0.003	< 0.003	0.0%
Total Recoverable	< 0.003	< 0.003	0.0%
Magnesium			
Dissolved	18.3	18.6	-1.6%
Total Recoverable	18.2	17.9	1.7%
Manganese			
Dissolved	1.06	1.08	-1.9%
Total Recoverable	1.07	1.05	1.9%

Analyte	29MAR12GW007	29MAR12GW107	RPD
Mercury			
Dissolved	< 0.0002	< 0.0002	0.0%
Total	< 0.0002	< 0.0002	0.0%
Molybdenum			
Dissolved	< 0.008	< 0.008	0.0%
Total Recoverable	< 0.008	< 0.008	0.0%
Nickel			
Dissolved	< 0.01	< 0.01	0.0%
Total Recoverable	< 0.01	< 0.01	0.0%
Nitrate/Nitrite as N	< 0.05	< 0.05	0.0%
pH	7.62	7.57	0.7%
Phosphorus	0.038	0.038	0.0%
Potassium			
Dissolved	0.89	0.9	-1.1%
Total Recoverable	0.83	0.83	0.0%
Selenium			
Dissolved	< 0.003	< 0.003	0.0%
Total Recoverable	< 0.003	< 0.003	0.0%
Silicon			
Dissolved	21.2	21.5	-1.4%
Total Recoverable	21.9	21.5	1.8%
Silver			
Dissolved	< 0.0001	< 0.0001	0.0%
Total Recoverable	< 0.0001	< 0.0001	0.0%
Sodium			
Dissolved	21.7	21.7	0.0%
Total Recoverable	22.6	22.1	2.2%
Specific conductance	482	483	-0.2%
Sulfate as SO4	1.17	1.19	-1.7%
Thallium			
Dissolved	< 0.001	< 0.001	0.0%
Total Recoverable	< 0.001	< 0.001	0.0%
Titanium			
Dissolved	< 0.005	< 0.005	0.0%
Total Recoverable	< 0.005	< 0.005	0.0%
Total Alkalinity	226	223	1.3%
Total Diss. Solids	260	268	-3.0%
Total Susp. Solids	6	6	0.0%
Turbidity	3.43	3.11	9.8%
Uranium			

Analyte	29MAR12GW007	29MAR12GW107	RPD
Dissolved	< 0.001	< 0.001	0.0%
Total Recoverable	< 0.001	< 0.001	0.0%
Vanadium			
Dissolved	< 0.005	< 0.005	0.0%
Total Recoverable	< 0.005	< 0.005	0.0%
Zinc			
Dissolved	< 0.01	< 0.01	0.0%
Total Recoverable	0.0139	0.01	32.6%

- Charge Balance: C/A balance was less than 10% for all of the samples – PASS
- Blank Samples: There was no field blank in this dataset. There were no analytes detected in the lab blanks.
- Laboratory vs. Field Analyses: Field and Lab conductivity measurements were close for most of these samples. However, the field versus lab measured conductivity measurements were off for two of the samples.

sample ID	Field pH	Lab pH	Ratio	Field Cond.	Lab Cond.	Ratio	Lab Meas. TDS	Lab Calc. TDS	Ratio
27MAR12GW001	5.34	6.03	0.89	6.3	75.3	0.08	78	65	1.2
27MAR12GW002	5.2	5.7	0.91	4.14	49.3	0.08	42	42	1.0
27MAR12GW003	6.8	6.95	0.98	243.2	269	0.9	181	210	0.86
28MAR12GW004	5.97	6.60	0.9	159.4	179	0.89	156	135	1.15
28MAR12GW005	6.84	7.27	0.94	314	353	0.89	198	202	0.98
28MAR12GW006	5.44	6.84	0.8	174.1	202	0.86	155	158	0.98
29MAR12GW007	6.67	7.62	0.88	463	482	0.96	260	283	0.92
29MAR12GW008	7.29	7.71	0.95	420	497	0.85	282	286	0.99
30MAR12GW009	6.78	7.62	0.89	414	431	0.96	258	278	0.93
NADD1298GW001	7.15	7.73	0.92	374	423	0.88	267	272	0.98

All Field Sample data copied from Field Forms:

Sample #	Water Temp (°C)	Conductivity (µS/cm)	Turbidity (NTU)	pH	Dissolved Oxygen (mg/L)	ORP (mV)
27MAR12GW001	26.2	6.3	2.51	5.34	1.56	45
27MAR12GW002	26.6	4.14	1.95	5.2	2.34	45.4
27MAR12GW003	28.4	243.2	1.46	6.8	1.52	44.7
28MAR12GW004	26	159.4	193	5.97	5.46	81.1
28MAR12GW005	26.9	314	1.56	6.84	0.65	78
28MAR12GW006	26.5	174.1	56.5	5.44	0.92	91.5
29MAR12GW007	25	463	5.38	6.67	11.4	50.3

29MAR12GW008	25	420	206	7.29	3.7	108.5
30MAR12GW009	29.6	414	0.75	6.78	0.69	30.5
NADD1298GW001	26.4	274	1.72	7.15	32.7	110.0

NM = Not measured/recorded on field forms

NA = Not applicable

- Comparison of Total and Dissolved Metal Analyses: Generally, given some measurement uncertainty, an RPD of greater than 20% will be considered unacceptable when dissolved concentrations are greater than total. Following is a list of samples and analytes with an RPD where the dissolved concentration was greater than total concentration of an analyte. All samples had an RPD < 20%.

Analyte	Dissolved	Total Recoverable	RPD	Notes
27MAR12GW001				
Calcium	0.327	0.323	1%	Pass
Potassium	0.9	0.85	6%	Pass
Sodium	12.3	12.2	1%	Pass
27MAR12GW002				
Barium	0.0089	0.0088	1%	Pass
Calcium	0.994	0.923	7%	Pass
Magnesium	2.12	2.08	2%	Pass
Manganese	0.0406	0.038	7%	Pass
Zinc	0.0529	0.0523	1%	Pass
27MAR12GW003				
Arsenic	0.0034	0.0032	6%	Pass
Magnesium	8.64	8.51	2%	Pass
Manganese	0.59	0.568	4%	Pass
Potassium	0.97	0.87	11%	Pass
28MAR12GW004				
28MAR12GW005				
Barium	0.15	0.148	1%	Pass
Calcium	25.3	25.2	0%	Pass
Magnesium	8.1	7.9	2%	Pass
Potassium	0.99	0.92	7%	Pass
Silicon	14.5	14.4	1%	Pass
28MAR12GW006				
Potassium	1.24	1.22	2%	Pass
29MAR12GW007				
Barium	0.164	0.156	5%	Pass
Magnesium	18.3	18.2	1%	Pass
Potassium	0.89	0.83	7%	Pass
29MAR12GW008				
Barium	0.038	0.0346	9%	Pass

Magnesium	14.3	14.2	1%	Pass
Manganese	0.782	0.764	2%	Pass
Potassium	2.46	2.39	3%	Pass
29MAR12GW107				
Barium	0.165	0.153	8%	Pass
Magnesium	18.6	17.9	4%	Pass
Manganese	1.08	1.05	3%	Pass
Potassium	0.9	0.83	8%	Pass
30MAR12GW009				
Barium	0.0292	0.0281	4%	Pass
Calcium	33	32.7	1%	Pass
Magnesium	18.1	17.4	4%	Pass
Manganese	0.713	0.703	1%	Pass
Potassium	0.95	0.87	9%	Pass
NADD1298GW001				
Calcium	28	27.8	1%	Pass
Magnesium	11.7	11.4	3%	Pass
Manganese	0.161	0.157	3%	Pass
Potassium	1.06	0.95	11%	Pass

- Inter-laboratory Comparison: results from University of Suriname laboratory have not yet been received for comparison of orthophosphate, TDS, and TSS

Summary:

	27MAR12GW001	27MAR12GW002	27MAR12GW003	28MAR12GW004	28MAR12GW005	28MAR12GW006	29MAR12GW007	29MAR12GW008	29MAR12GW107	30MAR12GW009	NADD1298GW001
Assessment of Completeness ¹	o	o	o	o	o	o	o	o	o	o	o
Assessment of Holding Times ²	o	o	o	o	o	o	o	o	o	o	o
Field Duplicate Sample Evaluation ³	NA	NA	NA	NA	NA	NA	o	NA	o	NA	NA
Charge Balance Errors	●	●	●	●	●	●	●	●	●	●	●
Blank samples	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Laboratory vs. Field Analyses ⁴	o	o	●	●	●	●	●	●	●	●	●
Comparison of Total and Dissolved	●	●	●	●	●	●	●	●	●	●	●
Inter-Laboratory Comparison	X	X	X	X	X	X	X	X	X	X	X

● = data OK, o = minor issue, see note, X = could not evaluate, NA = not applicable

Notes:

1 - There were no analyses of COD, as was requested on the COC

2 - All samples of turbidity, TDS/TSS, pH, alkalinity, hardness, and cyanide were analyzed past holding times.

3 - Only total recoverable zinc was >20% different between the field duplicate samples.

4 - The field and lab measurements of conductivity were >20% different.



TECHNICAL MEMORANDUM

Date: 16 July 2012

Project No.: 113-93245

To: File

Company:

From: Jeremy Clark

cc:

Email:

RE: DATA VALIDATION FOR SVL DATA PACKAGE W2E0270

Following is a summary of Golder's data validation review of SVL data package W2E0270 for 10 ground water samples:

- 24APR12GW001
- 24APR12GW002
- 24APR12GW102
- 24APR12GW003
- 25APR12GW004
- 25APR12GW005
- 26APR12GW006
- 27APR12GW007
- 27APR12GW008
- 28APR12GW009

The following data validation elements were described in the surface and ground water sampling SAP:

- Assessment of Completeness: PASS

COC Requested Analysis for SW	Analyzed
Dissolved Metals + Hg	Yes
Total Metals + Hg	Yes
TDS, TSS, pH	Yes
Anions/Alkalinity/Sulfate	Yes
NO2/NO3/Ammonia/Phos./COD	Yes
Cyanide (WAD, Free, Total)	Yes
Also: Conductivity, Turbidity, Hardness	Yes

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■ Assessment of Holding Times:

Parameter	Analysis Method	Holding Time (days)	Analysis (days post collection)	Note
TDS/TSS	SM 2540 C/D	7	17-20	Fail
Alkalinity	SM 2320B/2310B	14	14-17	Pass for 3 samples, Fail for 7
Hardness	SM 2340B	28	30-33	Fail
Mercury (total, dissolved)	245.1	28	24-27	Pass
Metals (total)	200.7	180	30-33	Pass
Metals (dissolved)	200.7	180	30-33	Pass
Metals (total), Sb, As, Se, Tl, U	200.8	180	28-29	Pass
Metals (dissolved) , Sb, As, Se, Tl	200.8	180	28-29	Pass
Cyanide (WAD/free/total)	SM 4500/ASTM D7237/ EPA 335.4	14	14-18	Pass for 3 samples, Fail for 7
Anions (Cl, F _i , SO ₄)	300.0	28	24-28	Pass
Ammonia, Nitrate/Nitrite	350.1, 353.2	28	22-27	Pass
Phosphorus, Total	SM 4500-P-E	28	18-21	Pass
Specific Conductance	120.1	28	14-17	Pass
Turbidity	180.1	2	14-17	Fail
pH	SM 4500 H B	<1	14-17	Fail

- Field Duplicate Sample Evaluation: Samples 24APR2012GW002 and 24APR2012GW102 were field duplicates. The following table shows the lab values and RPD for each analyte. All measured values were < 20 % different except for sulfate, total dissolved solids, and turbidity.

Analyte	24APR12GW002	24APR12GW102	RPD
Aluminum			
Dissolved	<0.08	<0.08	0.0%
Total Recoverable	<0.08	<0.08	0.0%
Ammonia as N	<0.03	<0.03	0.0%
Antimony			
Dissolved	<0.003	<0.003	0.0%
Total Recoverable	<0.003	<0.003	0.0%
Arsenic			
Dissolved	<0.003	<0.003	0.0%
Total Recoverable	<0.003	<0.003	0.0%
Barium			
Dissolved	0.0085	0.0086	-1.2%
Total Recoverable	0.009	0.0091	-1.1%
Beryllium			

Analyte	24APR12GW002	24APR12GW102	RPD
Dissolved	<0.0002	<0.0002	0.0%
Total Recoverable	<0.0002	<0.0002	0.0%
Bicarbonate	12.3	12.1	1.6%
Boron			
Dissolved	<0.04	<0.04	0.0%
Total Recoverable	<0.04	<0.04	0.0%
Cadmium			
Dissolved	<0.0002	<0.0002	0.0%
Total Recoverable	<0.0002	<0.0002	0.0%
Calcium			
Dissolved	0.939	0.913	2.8%
Total Recoverable	0.919	0.942	-2.5%
Carbonate	<1	<1	0.0%
Chloride	4.14	3.98	3.9%
Chromium			
Dissolved	<0.006	<0.006	0.0%
Total Recoverable	<0.006	<0.006	0.0%
Cobalt			
Dissolved	<0.006	<0.006	0.0%
Total Recoverable	<0.006	<0.006	0.0%
Copper			
Dissolved	<0.001	<0.001	0.0%
Total Recoverable	<0.001	<0.001	0.0%
Cyanide (free)	<0.005	<0.005	0.0%
Cyanide (total)	<0.01	<0.01	0.0%
Cyanide (WAD)	<0.01	<0.01	0.0%
Fluoride	<0.1	<0.1	0.0%
Hardness (as CaCO3)	10.8	11	-1.8%
Iron			
Dissolved	<0.06	<0.06	0.0%
Total Recoverable	<0.06	<0.06	0.0%
Lead			
Dissolved	<0.003	<0.003	0.0%
Total Recoverable	<0.003	<0.003	0.0%
Magnesium			
Dissolved	2.05	2.11	-2.9%
Total Recoverable	2.08	2.13	-2.4%
Manganese			
Dissolved	0.0341	0.0335	1.8%
Total Recoverable	0.0336	0.0341	-1.5%

Analyte	24APR12GW002	24APR12GW102	RPD
Mercury			
Dissolved	<0.0002	<0.0002	0.0%
Total	<0.0002	<0.0002	0.0%
Molybdenum			
Dissolved	<0.008	<0.008	0.0%
Total Recoverable	<0.008	<0.008	0.0%
Nickel			
Dissolved	<0.01	<0.01	0.0%
Total Recoverable	<0.01	<0.01	0.0%
Nitrate/Nitrite as N	0.116	0.117	-0.9%
pH	5.99	5.88	1.9%
Phosphorus	<0.01	<0.01	0.0%
Potassium			
Dissolved	<0.5	<0.5	0.0%
Total Recoverable	<0.5	<0.5	0.0%
Selenium			
Dissolved	<0.003	<0.003	0.0%
Total Recoverable	<0.003	<0.003	0.0%
Silicon			
Dissolved	8.46	8.45	0.1%
Total Recoverable	8.65	8.95	-3.4%
Silver			
Dissolved	<0.0001	<0.0001	0.0%
Total Recoverable	<0.0001	<0.0001	0.0%
Sodium			
Dissolved	3.83	3.82	0.3%
Total Recoverable	3.7	3.79	-2.4%
Specific conductance	41	40.9	0.2%
Sulfate as SO4	0.87	1.37	-44.6%
Thallium			
Dissolved	<0.001	<0.001	0.0%
Total Recoverable	<0.001	<0.001	0.0%
Titanium			
Dissolved	<0.005	<0.005	0.0%
Total Recoverable	<0.005	<0.005	0.0%
Total Alkalinity	12.3	12.1	1.6%
Total Diss. Solids	34	23	38.6%
Total Susp. Solids	<5	<5	0.0%
Turbidity	0.224	0.164	30.9%
Uranium			

Analyte	24APR12GW002	24APR12GW102	RPD
Dissolved	<0.001	<0.001	0.0%
Total Recoverable	<0.001	<0.001	0.0%
Vanadium			
Dissolved	<0.005	<0.005	0.0%
Total Recoverable	<0.005	<0.005	0.0%
Zinc			
Dissolved	0.0439	0.0437	0.5%
Total Recoverable	0.0456	0.0463	-1.5%

- Charge Balance: C/A balance was less than 10% for all of the samples – PASS
- Blank Samples: There was no field blank in this dataset. There were no analytes detected in the lab blanks.
- Laboratory vs. Field Analyses: Field and Lab conductivity measurements of pH and conductivity were close for all of these samples. However, the lab measured versus calculated total dissolved solids results were off by >20% for seven of the ten samples.

sample ID	Field pH	Lab pH	Ratio	Field Cond.	Lab Cond.	Ratio	Lab Meas. TDS	Lab Calc. TDS	Ratio
24APR12GW001	5.23	6.1	0.86	60.9	57.8	1.05	61	62	0.99
24APR12GW002	5.18	5.99	0.86	43.8	41	1.07	34	43	0.83
24APR12GW102	5.18	5.88	0.88	43.8	40.9	1.07	34	44	0.83
24APR12GW003	6.33	7.19	0.88	243	224	1.08	171	210	0.76
25APR12GW004	6.74	7.66	0.88	340	300	1.13	156	209	0.75
25APR12GW005	5.81	6.89	0.84	159.2	141	1.13	72	129	0.56
26APR12GW006	7.29	8.09	0.9	417	416	1	223	290	0.77
27APR12GW007	6.09	7.3	0.83	185.4	169	1.1	94	188	0.5
27APR12GW008	7.01	7.83	0.9	449	405	1.11	211	291	0.73
28APR12GW009	6.78	7.82	0.87	389	368	1.06	216	290	0.75

All Field Sample data copied from Field Forms:

Sample #	Water Temp (°C)	Conductivity (µS/cm)	Turbidity (NTU)	pH	Dissolved Oxygen (mg/L)	ORP (mV)
24APR12GW001	27	60.9	1.03	5.23	23.9	267.7
24APR12GW002	26.3	43.8	0.38	5.18	32.3	239.5
24APR12GW003	27	243	0.69	6.33	8.7	NM
25APR12GW004	27.6	340	0.59	6.74	5.5	166.7
25APR12GW005	26	159.2	142	5.81	20.5	NM
26APR12GW006	27	417	1.32	7.29	3.7	NM
27APR12GW007	25.7	185.4	152	6.09	10.1	261.6

27APR12GW008	26.1	449	3.46	7.01	5.1	137.8
28APR12GW009	28.9	389	0.28	6.78	12.6	166

NM = Not measured/recorded on field forms

NA = Not applicable

- Comparison of Total and Dissolved Metal Analyses: Generally, given some measurement uncertainty, an RPD of greater than 20% will be considered unacceptable when dissolved concentrations are greater than total. Following is a list of samples and analytes with an RPD where the dissolved concentration was greater than total concentration of an analyte. All samples had an RPD < 20% except for selenium in 26APR12GW006.

Analyte	Dissolved	Total Recoverable	RPD	Notes
24APR12GW001				
24APR12GW002				
Calcium	0.939	0.919	2%	Pass
Manganese	0.0341	0.0336	1%	Pass
Sodium	3.83	3.7	3%	Pass
24APR12GW102				
Sodium	3.82	3.79	1%	Pass
24APR12GW003				
Arsenic	0.0034	0.0033	3%	Pass
Manganese	0.587	0.579	1%	Pass
Potassium	0.88	0.87	1%	Pass
25APR12GW004				
25APR12GW005				
26APR12GW006				
Selenium	0.00498	-0.003	50%	Fail
27APR12GW007				
27APR12GW008				
28APR12GW009				

- Inter-laboratory Comparison: results from University of Suriname laboratory have not yet been received for comparison of orthophosphate, TDS, and TSS

Summary:

	24APR12GW001	24APR12GW002	24APR12GW102	24APR12GW003	25APR12GW004	25APR12GW005	26APR12GW006	27APR12GW007	27APR12GW008	28APR12GW009	24APR12GW001
Assessment of Completeness	●	●	●	●	●	●	●	●	●	●	●
Assessment of Holding Times ¹	○	○	○	○	○	○	○	○	○	○	○
Field Duplicate Sample Evaluation ²	NA	○	○	NA	NA	NA	NA	NA	NA	NA	NA
Charge Balance Errors	●	●	●	●	●	●	●	●	●	●	●
Blank samples	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Laboratory vs. Field Analyses ³	●	●	●	○	○	○	○	○	○	○	●
Comparison of Total and Dissolved ⁴	●	●	●	●	●	●	○	●	●	●	●
Inter-Laboratory Comparison	X	X	X	X	X	X	X	X	X	X	X

● = data OK, ○ = minor issue, see note, X = could not evaluate, NA = not applicable

Notes:

1 - All samples of turbidity, TDS/TSS, pH, hardness, were analyzed past holding times. Alkalinity and cyanide were analyzed past holding times for all samples except 27APR12GW007, 27APR12GW008, and 28APR12GW009

2 – All measured values were < 20 % different between the field duplicate samples except for sulfate, total dissolved solids, and turbidity.

3 - The field and lab measurements of pH and conductivity were <20% different. The lab measured vs. calculated TDS values were >20% different for 7 of the 10 samples.

4 - All samples had an RPD < 20% except for selenium in 26APR12GW006.



TECHNICAL MEMORANDUM

Date: 17 July 2012

Project No.: 113-93245

To: File

Company:

From: Jeremy Clark

cc:

Email:

RE: DATA VALIDATION FOR SVL DATA PACKAGE W2E0651

Following is a summary of Golder's data validation review of SVL data package W2E0651 for 10 ground water samples:

- 15MAY12GW001
- 15MAY12GW101
- 16MAY12GW002
- 16MAY12GW003
- 16MAY12GW004
- 17MAY12GW005
- 18MAY12GW006
- 18MAY12GW007
- 19MAY12GW008
- 19MAY12GW009

The following data validation elements were described in the surface and ground water sampling SAP:

- Assessment of Completeness: PASS

COC Requested Analysis for SW	Analyzed
Dissolved Metals + Hg	Yes
Total Metals + Hg	Yes
TDS, TSS, pH	Yes
Anions/Alkalinity/Sulfate	Yes
NO2/NO3/Ammonia/Phos./COD	Yes
Cyanide (WAD, Free, Total)	Yes
Also: Conductivity, Hardness	Yes

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■ Assessment of Holding Times:

Parameter	Analysis Method	Holding Time (days)	Analysis (days post collection)	Note
TDS/TSS	SM 2540 C/D	7	5-9	Pass, Fail for 4 samples - 001 through 004
Alkalinity	SM 2320B/2310B	14	6-14	Pass
Hardness	SM 2340B	28	20-24	Pass
Mercury (total, dissolved)	245.1	28	19-23	Pass
Metals (total)	200.7	180	21-25	Pass
Metals (dissolved)	200.7	180	21-25	Pass
Metals (total), Sb, As, Se, Tl, U	200.8	180	25-29	Pass
Metals (dissolved) , Sb, As, Se, Tl	200.8	180	25-29	Pass
Cyanide (WAD/free/total)	SM 4500/ASTM D7237/ EPA 335.4	14	10-14	Pass
Anions (Cl, F, SO ₄)	300.0	28	20-23	Pass
Ammonia, Nitrate/Nitrite	350.1, 353.2	28	18-23	Pass
Phosphorus, Total	SM 4500-P-E	28	6-10	Pass
Specific Conductance	120.1	28	5-9	Pass
pH	SM 4500 H B	<1	6-14	Fail

- Field Duplicate Sample Evaluation: Samples 15MAY12GW001 and 15MAY12GW101 were field duplicates. The following table shows the lab values and RPD for each analyte. All measured values were < 20 % different except for total recoverable silver.

Analyte	15MAY12GW001	15MAY12GW101	RPD
Aluminum			
Dissolved	< 0.08	< 0.08	0.0%
Total Recoverable	< 0.08	< 0.08	0.0%
Ammonia as N	0.1	0.097	3.0%
Antimony			
Dissolved	< 0.003	< 0.003	0.0%
Total Recoverable	< 0.003	< 0.003	0.0%
Arsenic			
Dissolved	0.0036	0.0036	0.0%
Total Recoverable	0.0031	< 0.003	3.3%
Barium			
Dissolved	0.0209	0.0209	0.0%
Total Recoverable	0.0231	0.0231	0.0%

Analyte	15MAY12GW001	15MAY12GW101	RPD
Beryllium			
Dissolved	< 0.0002	< 0.0002	0.0%
Total Recoverable	< 0.0002	< 0.0002	0.0%
Bicarbonate	108	115	-6.3%
Boron			
Dissolved	< 0.04	< 0.04	0.0%
Total Recoverable	< 0.04	< 0.04	0.0%
Cadmium			
Dissolved	< 0.0002	< 0.0002	0.0%
Total Recoverable	< 0.0002	< 0.0002	0.0%
Calcium			
Dissolved	12.5	12.5	0.0%
Total Recoverable	12.9	13.1	-1.5%
Carbonate	< 1	< 1	0.0%
Chloride	9.82	9.79	0.3%
Chromium			
Dissolved	< 0.006	< 0.006	0.0%
Total Recoverable	< 0.006	< 0.006	0.0%
Cobalt			
Dissolved	< 0.006	< 0.006	0.0%
Total Recoverable	< 0.006	< 0.006	0.0%
Copper			
Dissolved	< 0.001	< 0.001	0.0%
Total Recoverable	0.0011	0.00113	-2.7%
Cyanide (free)	< 0.005	< 0.005	0.0%
Cyanide (total)	< 0.01	< 0.01	0.0%
Cyanide (WAD)	< 0.01	< 0.01	0.0%
Fluoride	0.27	0.28	-3.6%
Hardness (as CaCO3)	65.7	66.3	-0.9%
Iron			
Dissolved	2.41	2.41	0.0%
Total Recoverable	2.55	2.53	0.8%
Lead			
Dissolved	< 0.003	< 0.003	0.0%
Total Recoverable	< 0.003	< 0.003	0.0%
Magnesium			
Dissolved	8.39	8.52	-1.5%
Total Recoverable	8.8	8.78	0.2%
Manganese			
Dissolved	0.578	0.587	-1.5%

Analyte	15MAY12GW001	15MAY12GW101	RPD
Total Recoverable	0.599	0.6	-0.2%
Mercury			
Dissolved	< 0.0002	< 0.0002	0.0%
Total	< 0.0002	< 0.0002	0.0%
Molybdenum			
Dissolved	< 0.008	< 0.008	0.0%
Total Recoverable	< 0.008	< 0.008	0.0%
Nickel			
Dissolved	< 0.01	< 0.01	0.0%
Total Recoverable	< 0.01	< 0.01	0.0%
Nitrate/Nitrite as N	< 0.05	< 0.05	0.0%
pH	7.42	7.34	1.1%
Phosphorus	0.381	0.384	-0.8%
Potassium			
Dissolved	0.94	0.95	-1.1%
Total Recoverable	0.85	0.91	-6.8%
Selenium			
Dissolved	< 0.003	< 0.003	0.0%
Total Recoverable	< 0.003	< 0.003	0.0%
Silicon			
Dissolved	32.6	32.8	-0.6%
Total Recoverable	33.1	33.4	-0.9%
Silver			
Dissolved	< 0.0001	< 0.0001	0.0%
Total Recoverable	0.00021	< 0.0001	71.0%
Sodium			
Dissolved	24.4	25.3	-3.6%
Total Recoverable	22.4	22.7	-1.3%
Specific conductance	246	250	-1.6%
Sulfate as SO4	1.37	1.37	0.0%
Thallium			
Dissolved	< 0.001	< 0.001	0.0%
Total Recoverable	< 0.001	< 0.001	0.0%
Titanium			
Dissolved	< 0.005	< 0.005	0.0%
Total Recoverable	< 0.005	< 0.005	0.0%
Total Alkalinity	108	115	-6.3%
Total Diss. Solids	176	184	-4.4%
Total Susp. Solids	< 5	< 5	0.0%
Uranium			

Analyte	15MAY12GW001	15MAY12GW101	RPD
Dissolved	< 0.001	< 0.001	0.0%
Total Recoverable	< 0.001	< 0.001	0.0%
Vanadium			
Dissolved	< 0.005	< 0.005	0.0%
Total Recoverable	< 0.005	< 0.005	0.0%
Zinc			
Dissolved	< 0.01	< 0.01	0.0%
Total Recoverable	< 0.01	< 0.01	0.0%

- Charge Balance: C/A balance was less than 10% for all of the samples – PASS
- Blank Samples: There was no field blank in this dataset. There were no analytes detected in the lab blanks.
- Laboratory vs. Field Analyses: Field and Lab conductivity measurements of pH and conductivity were close for all of these samples except 16MAY12GW003. This was the only sample where the lab measured versus calculated total dissolved solids results were off by >20%.

sample ID	Field pH	Lab pH	Ratio	Field Cond.	Lab Cond.	Ratio	Lab Meas. TDS	Lab Calc. TDS	Ratio
15MAY12GW001	6.4	7.42	0.86	254.9	246	1.04	176	211	0.83
15MAY12GW101	6.4	7.34	0.87	254.9	250	1.02	184	216	0.85
16MAY12GW002	5.26	5.66	0.93	60.8	47.6	1.28	51	58	0.87
16MAY12GW003	5.35	5.42	0.99	47.1	60	0.79	66	43	1.55
16MAY12GW004	6.88	7.75	0.89	310	341	0.91	188	213	0.88
17MAY12GW005	7.49	7.99	0.94	456	470	0.97	276	284	0.97
18MAY12GW006	6.31	6.96	0.91	152.5	151	1.01	108	121	0.89
18MAY12GW007	6.26	6.96	0.9	182.7	188	0.97	137	160	0.86
19MAY12GW008	7.16	7.86	0.91	468	474	0.99	275	286	0.96
19MAY12GW009	6.99	7.64	0.91	410	408	1.0	264	287	0.92

All Field Sample data copied from Field Forms:

Sample #	Water Temp (°C)	Conductivity (µS/cm)	Turbidity (NTU)	pH	Dissolved Oxygen (mg/L)	ORP (mV)
15MAY12GW001	26.7	254.9	37	6.4	5.3	-51.3
16MAY12GW002	25.8	60.8	1.87	5.26	17.4	261
16MAY12GW003	26.4	47.1	0.44	5.35	26.4	294
16MAY12GW004	20.3	310	0.84	6.88	34.8	154
17MAY12GW005	27.7	456	1.03	7.49	4	110
18MAY12GW006	26	152.5	107	6.31	6.9	176
18MAY12GW007	27.3	182.7	27.4	6.26	11.7	-64.6

19MAY12GW008	25	468	0.5	7.16	4.2	99.7
19MAY12GW009	29.2	410	1.18	6.99	7.8	58.8

NM = Not measured/recorded on field forms

NA = Not applicable

- Comparison of Total and Dissolved Metal Analyses: Generally, given some measurement uncertainty, an RPD of greater than 20% will be considered unacceptable when dissolved concentrations are greater than total. Following is a list of samples and analytes with an RPD where the dissolved concentration was greater than total concentration of an analyte. All samples had an RPD < 20%.

Sample/Analyte	Dissolved	Total Recoverable	RPD	Notes
15MAY12GW001				
Arsenic	0.0036	0.0031	15%	Pass
Potassium	0.94	0.85	10%	Pass
Sodium	24.4	22.4	9%	Pass
15MAY12GW101				
Arsenic	0.0036	-0.003	18%	Pass
Potassium	0.95	0.91	4%	Pass
Sodium	25.3	22.7	11%	Pass
16MAY12GW002	23.15	21.9835		
Aluminum	0.105	0.086	19.9%	Pass
Calcium	0.321	0.291	10%	Pass
Sodium	11.3	9.99	12%	Pass
16MAY12GW003	14.7907	14.7584		
Calcium	0.9	0.883	2%	Pass
Sodium	4.28	3.73	14%	Pass
Zinc	0.0194	0.0184	5%	Pass
16MAY12GW004	85.4333	83.4675		
Potassium	0.93	0.89	4%	Pass
Sodium	30.1	26.2	14%	Pass
17MAY12GW005	111.0801	107.8467		
Potassium	2.55	2.52	1%	Pass
Sodium	42.4	36.8	14%	Pass
18MAY12GW006	42.8217	66.54686		
Sodium	31.7	28.5	11%	Pass
18MAY12GW007	59.8151	64.32554		
Sodium	24.4	20.9	15%	Pass
19MAY12GW008	106.5583	107.9335		
Potassium	0.81	0.79	3%	Pass
Sodium	25.2	21.9	14%	Pass
19MAY12GW009	105.9004	105.9578		
Potassium	0.8	0.76	5%	Pass
Sodium	24.4	21.2	14%	Pass

- Inter-laboratory Comparison: results from University of Surname laboratory have not yet been received for comparison of orthophosphate, TDS, and TSS

Summary:

	15MAY12GW001	15MAY12GW101	16MAY12GW002	16MAY12GW003	16MAY12GW004	17MAY12GW005	18MAY12GW006	18MAY12GW007	19MAY12GW008	19MAY12GW009	15MAY12GW001
Assessment of Completeness	●	●	●	●	●	●	●	●	●	●	●
Assessment of Holding Times ¹	○	○	○	○	○	○	○	○	○	○	○
Field Duplicate Sample Evaluation ²	○	○	NA	NA	NA	NA	NA	NA	NA	NA	○
Charge Balance Errors	●	●	●	●	●	●	●	●	●	●	●
Blank samples	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Laboratory vs. Field Analyses ³	●	●	●	○	●	●	●	●	●	●	●
Comparison of Total and Dissolved	●	●	●	●	●	●	●	●	●	●	●
Inter-Laboratory Comparison	X	X	X	X	X	X	X	X	X	X	X

● = data OK, ○ = minor issue, see note, X = could not evaluate, NA = not applicable

Notes:

- 1 - All samples of pH and 4 of 10 samples for TDS/TSS were analyzed past holding times.
- 2 – All measured values were < 20 % different between the field duplicate samples except for total recoverable silver.
- 3 - Sample 16MAY12GW003 had conductivity and measured versus calculated TDS > 20% different.

APPENDIX C
SEDIMENT GRAIN SIZE ANALYSIS RESULTS

Table C-1 Sediment Particle Size Label Identification

Date Sampled	Sample #	Site ID
16-Nov-11	11162011SD001	SW-35
16-Nov-11	11162011SD002	SW-37
16-Nov-11	11162011SD003	SW-38
16-Nov-11	11182011SD004	SW-04B
20-Nov-11	11202011SD006	SW-15
20-Nov-11	11202011SD007	SW-26
20-Nov-11	11202011SW008	SW-32
21-Nov-11	11212011SD011	SW-23
21-Nov-11	11212011SD012	SW-13
21-Nov-11	11212011SD013	SW-21
22-Nov-11	11222011SD015	SW 29
23-Nov-11	11232011SD016	SW-34
24-Nov-11	11242011SD017	SW-27
24-Nov-11	11242011SD018	SW-34
24-Nov-11	11242011SD019	SW-31
25-Nov-11	11242011SD020	SW-04A
26-Nov-11	11262011SD021	SW-30
16-Dec-11	12162011SW025	SW-28



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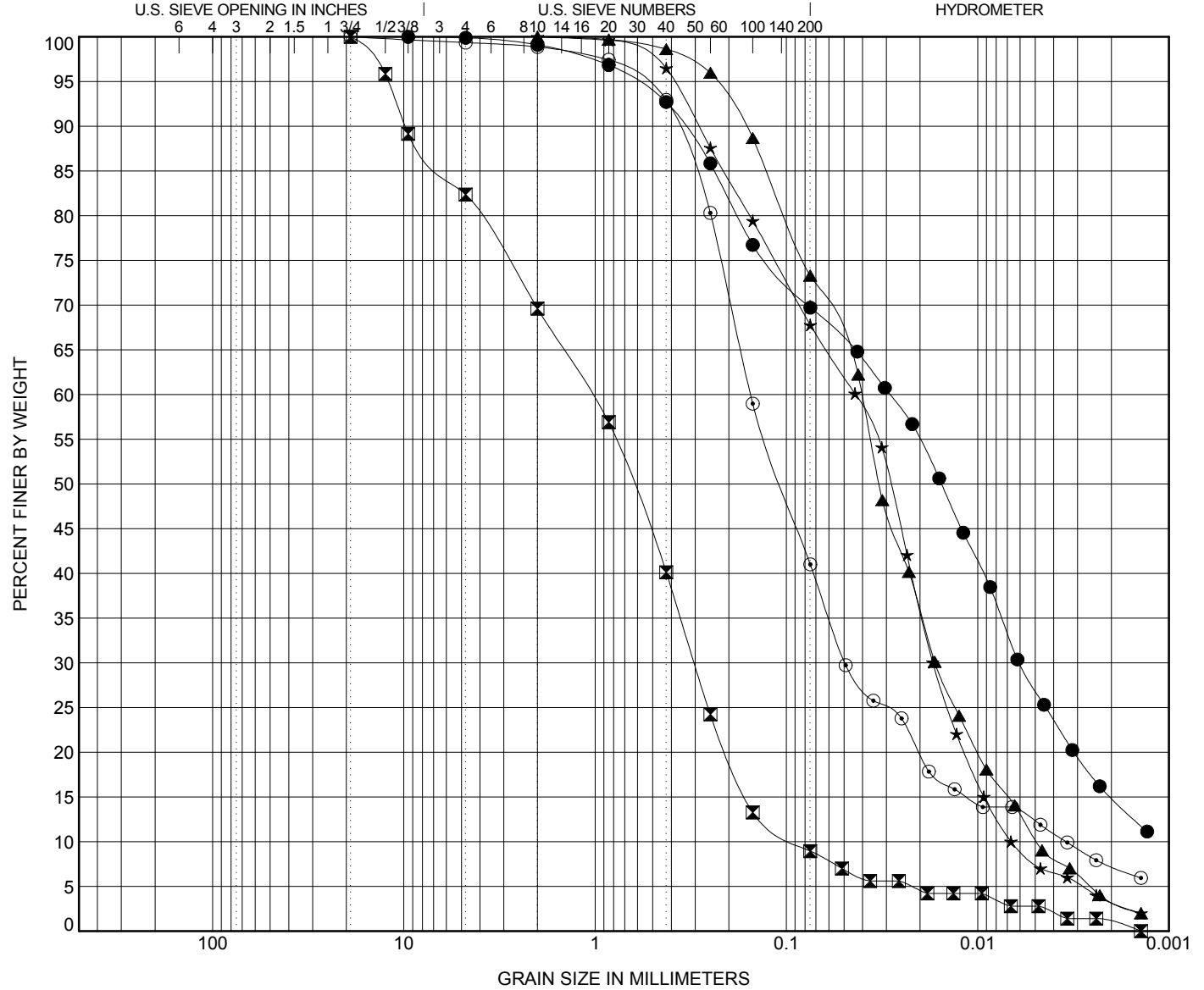
GRAIN SIZE DISTRIBUTION

CLIENT Newmont Merian

PROJECT NAME Newmont Merian Feasibility

PROJECT NUMBER 113-93245

PROJECT LOCATION Suriname



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE	DEPTH	Classification				LL	PL	PI	Cc	Cu
●	1122011SD015	0.0								
☒	1162011SD003	0.0							0.99	11.80
▲	1182011SD004	0.0							1.41	8.22
★	1202011SD007	0.0							1.01	6.51
⊙	11162011SD001	0.0							4.62	44.56

BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	1122011SD015	0.0	9.5	0.029	0.006	0.1	30.2	42.7	27.0
☒	1162011SD003	0.0	19	1.048	0.303	0.089	17.6	73.4	6.1
▲	1182011SD004	0.0	2	0.04	0.017	0.005	0.0	26.7	63.0
★	1202011SD007	0.0	2	0.044	0.017	0.007	0.0	32.2	60.2
⊙	11162011SD001	0.0	19	0.154	0.049	0.003	0.6	58.3	28.8

GRAIN SIZE - GINT STD US LAB.GDT - 6/12/12 14:23 - \\SEA1-V-FS1\ENVIRONMENTAL\PROJECTS_2011\PROJECTS\113-93245\NEWMONT SURGOLD MERIAN FEASIBILITY\070 GEOTECH LABS\HOUSTON\HOUSTON RESULTS\GINT\193245GINT.GPJ



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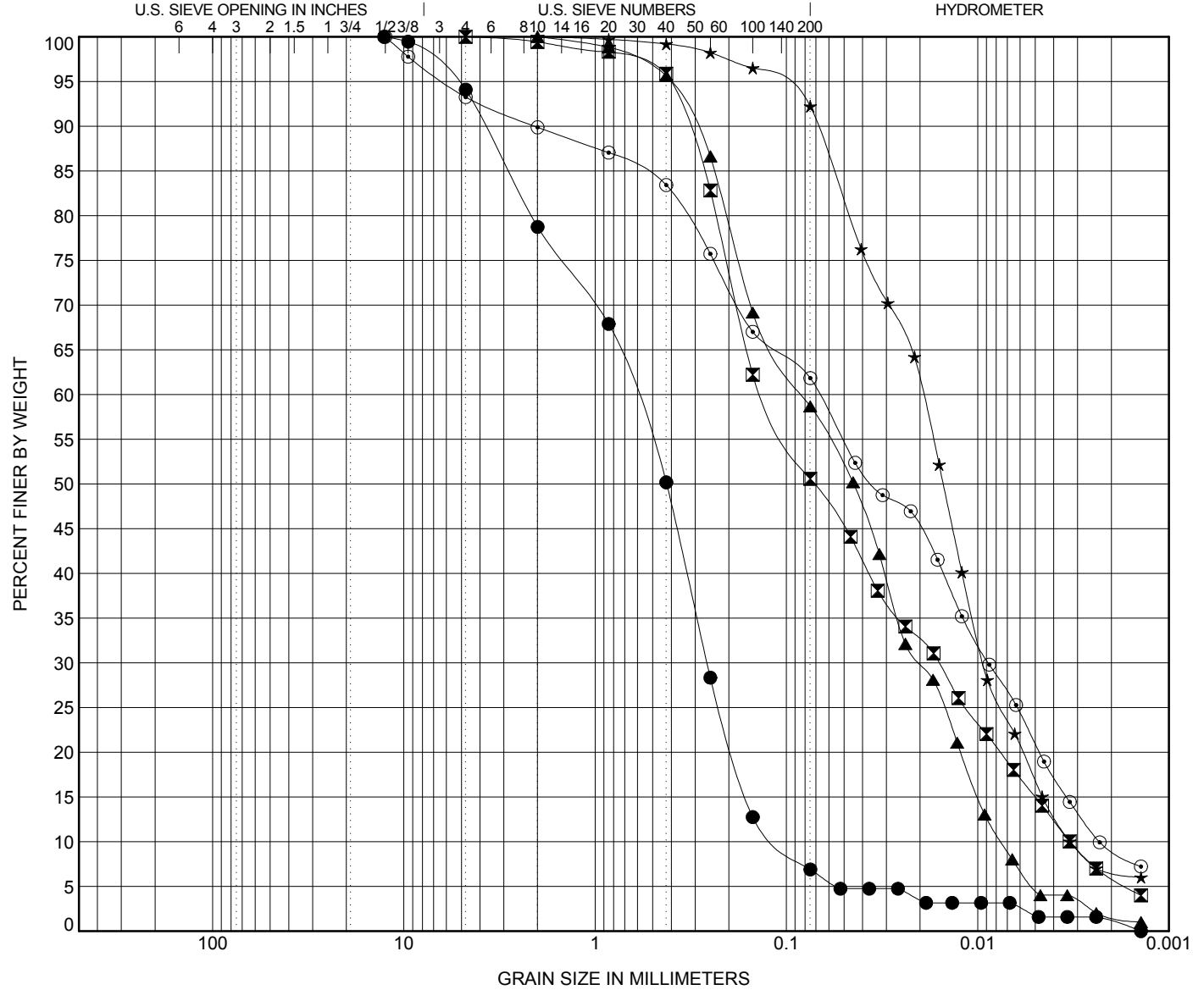
GRAIN SIZE DISTRIBUTION

CLIENT Newmont Merian

PROJECT NAME Newmont Merian Feasibility

PROJECT NUMBER 113-93245

PROJECT LOCATION Suriname



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE	DEPTH	Classification					LL	PL	PI	Cc	Cu
●	11162011SD002 0.0									1.00	5.76
☒	11202011SD006 0.0									0.59	39.92
▲	11202011SD008 0.0									0.65	10.88
★	11212011SD011 0.0									1.38	5.87
⊙	11212011SW013 0.0									0.50	29.20

BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	11162011SD002 0.0	12.7	0.624	0.26	0.108	5.9	87.2	5.1	1.8
☒	11202011SD006 0.0	4.75	0.131	0.016	0.003	0.0	49.4	35.6	15.0
▲	11202011SD008 0.0	2	0.082	0.02	0.008	0.0	41.3	53.9	4.7
★	11212011SD011 0.0	2	0.019	0.009	0.003	0.0	7.8	75.4	16.8
⊙	11212011SW013 0.0	12.5	0.068	0.009	0.002	6.7	31.4	40.9	20.9

GRAIN SIZE - GINT STD US LAB.GDT - 6/12/12 14:23 - \\SEA1-V-FS1\ENVIRONMENTAL\PROJECTS_2011\PROJECTS\113-93245\NEWMONT SURGOLD MERIAN FEASIBILITY\070 GEOTECH LABS\HOUSTON\HOUSTON RESULTS\GINT\193245GINT.GPJ



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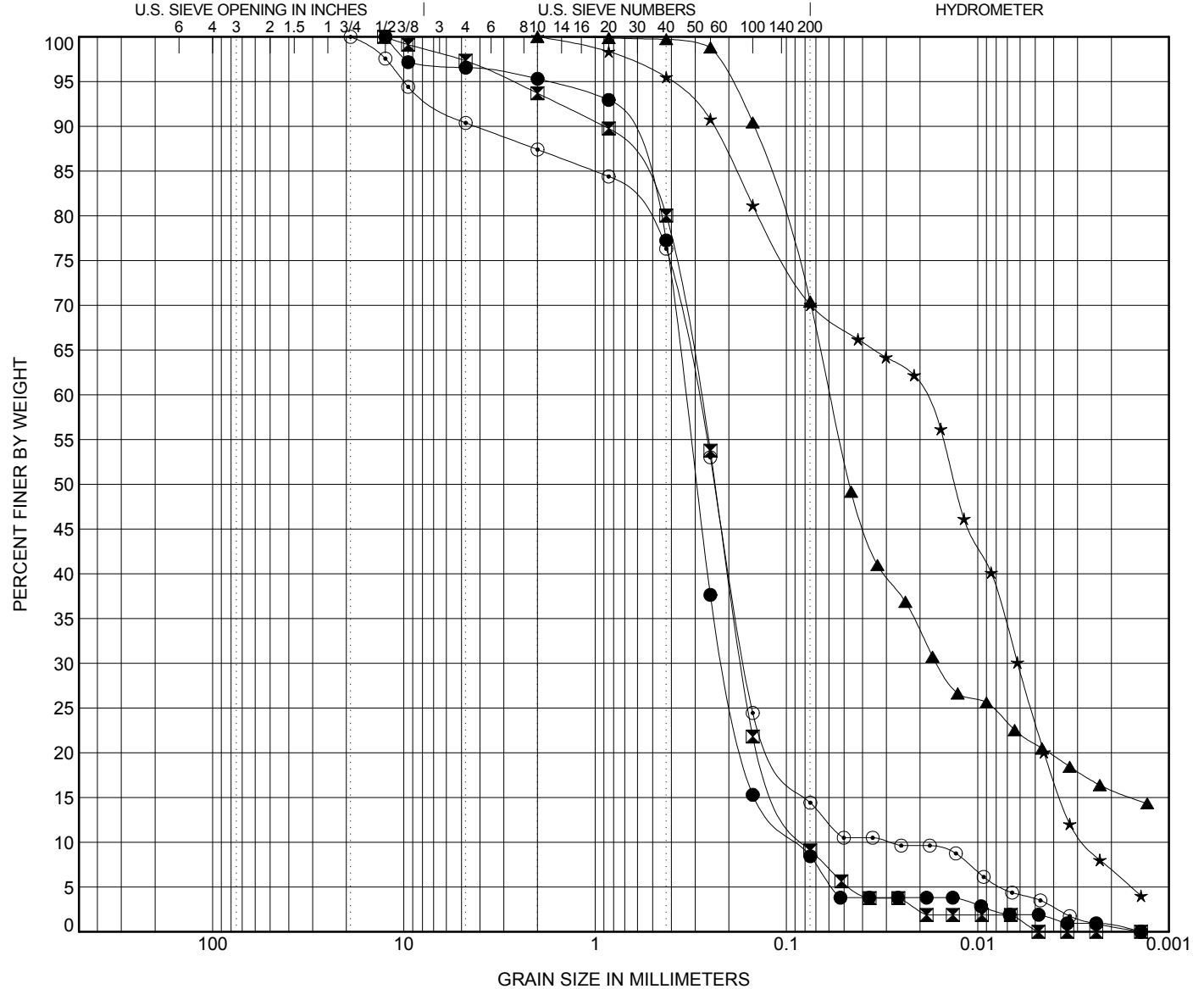
GRAIN SIZE DISTRIBUTION

CLIENT Newmont Merian

PROJECT NAME Newmont Merian Feasibility

PROJECT NUMBER 113-93245

PROJECT LOCATION Suriname



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE	DEPTH	Classification					LL	PL	PI	Cc	Cu
●	11242011SD012 0.0									1.49	3.84
☒	11242011SD016 0.0									1.31	3.60
▲	11242011SD018 0.0										
★	11242011SD019 0.0									0.73	6.96
○	11242011SD020 0.0									3.23	10.10

BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	11242011SD012 0.0	12.5	0.337	0.21	0.088	3.5	88.1	6.5	1.9
☒	11242011SD016 0.0	12.7	0.284	0.171	0.079	2.7	88.2	8.9	0.2
▲	11242011SD018 0.0	2	0.059	0.016		0.0	29.6	49.4	21.0
★	11242011SD019 0.0	2	0.019	0.006	0.003	0.0	29.9	46.7	23.4
○	11242011SD020 0.0	19	0.293	0.166	0.029	9.6	76.0	10.8	3.7

GRAIN SIZE - GINT STD US LAB.GDT - 6/12/12 14:23 - \\SEA1-V-FS1\ENVIRONMENTAL\PROJECTS_2011\PROJECTS\113-93245 NEWMONT SURGOLD MERIAN FEASIBILITY\070 GEOTECH LABS\HOUSTON\HOUSTON RESULTS\GINT\193245GINT.GPJ

LOGO

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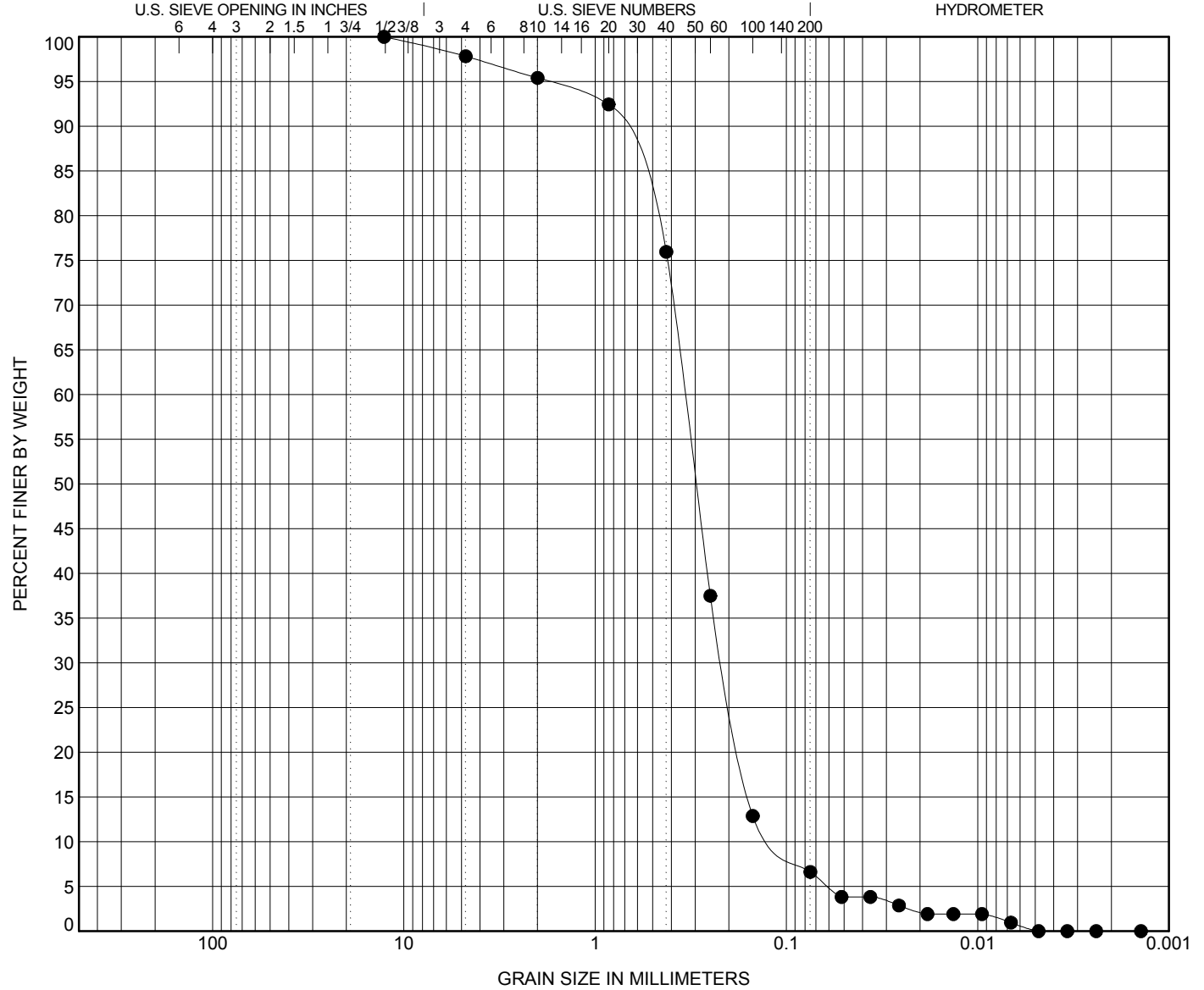
GRAIN SIZE DISTRIBUTION

CLIENT Newmont Merian

PROJECT NAME Newmont Merian Feasibility

PROJECT NUMBER 113-93245

PROJECT LOCATION Suriname



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE	DEPTH	Classification					LL	PL	PI	Cc	Cu
● 11262011SD021	0.0									1.23	3.13
BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay		
● 11262011SD021	0.0	12.7	0.341	0.214	0.109	2.2	91.2	6.5	0.1		

GRAIN SIZE - GINT STD US LAB.GDT - 6/12/12 14:23 - \\SEA1-V-FS1\ENVIRONMENTAL\PROJECTS_2011\PROJECTS\113-93245\NEWMONT SURGOLD MERIAN FEASIBILITY\070 GEOTECH LABS\HOUSTON\HOUSTON RESULTS\GINT\193245GINT.GPJ

GRAIN SIZE - GINT STD US LAB.GDT - 6/12/12 14:20 - \\SEA1-V-FS1\ENVIRONMENTAL\PROJECTS_2011\PROJECTS\113-93245 NEWMONT SURGOLD MERIAN FEASIBILITY\070 GEOTECH LABS\BURNABY\RESULTS\SEDIMENT\MERIAN PIT GEOTECH - MERIAN MINE



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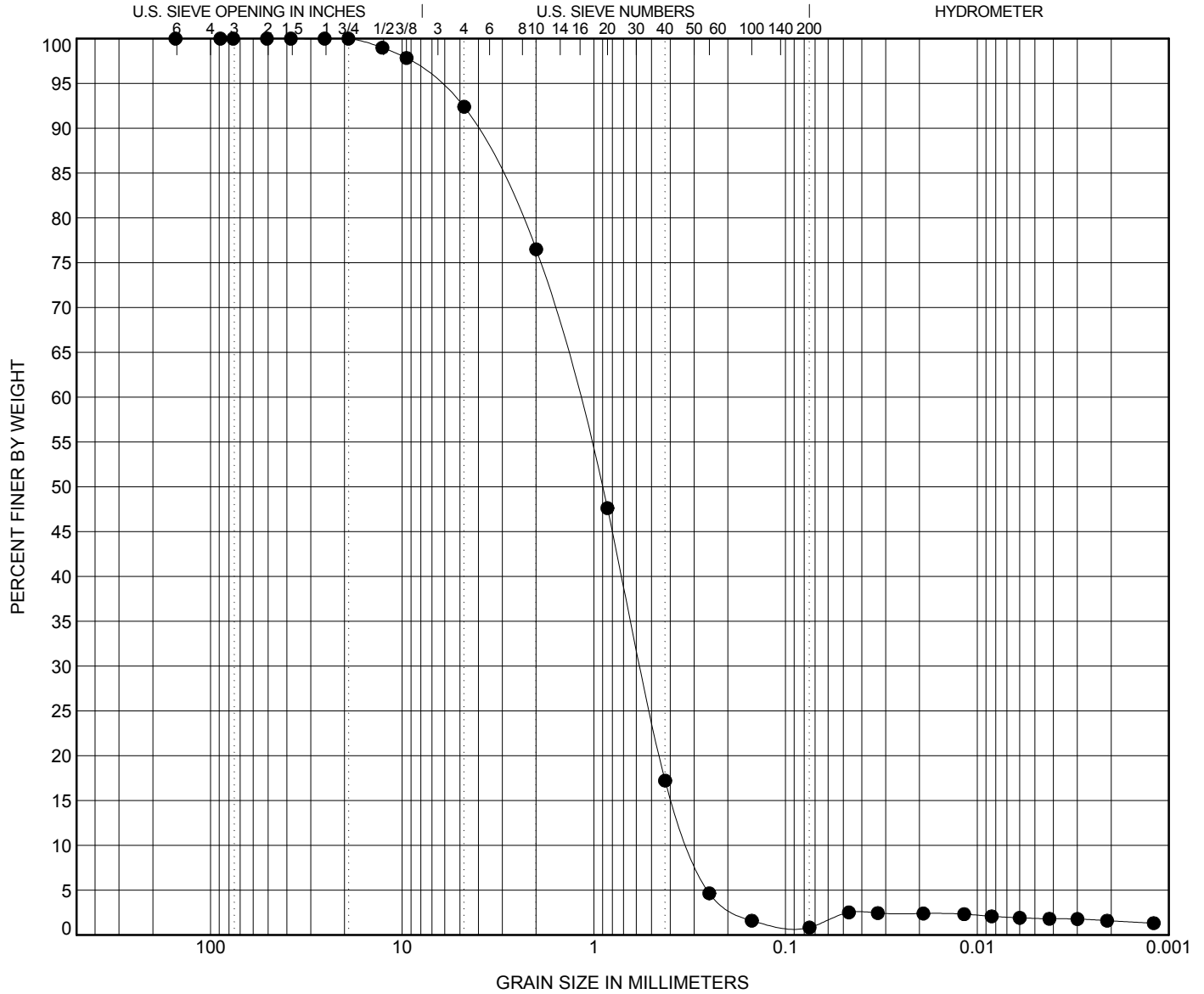
GRAIN SIZE DISTRIBUTION

CLIENT Newmont USA Ltd.

PROJECT NAME _____

PROJECT NUMBER _____

PROJECT LOCATION _____



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
● 12162011SW025	0.0	POORLY GRADED SAND(SP)				0.84	3.91

BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● 12162011SW025	0.0	152.4	1.227	0.569	0.313	7.6	91.6	-1.0	1.9

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