REPORT

HYDROGEOLOGIC EVALUATION - SANTA MARGARITA QUARRY EXTENSION

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1.0 INTRODUCTION

1.1 Objective

Golder Associates Inc. (Golder) has prepared this Hydrogeologic Evaluation Report for Lehigh Hanson in support of permitting efforts related to extension of the Santa Margarita Quarry (the quarry) in San Luis Obispo County, California (Figure 1).

The objective of this work effort was to provide a baseline characterization of the hydrologic and hydrogeologic conditions of the quarry such that (1) the current conditions are documented, and (2) potential changes to the hydrologic systems associated with future proposed mining efforts can be evaluated.

1.2 Project Background

1.2.1 Existing Operations

The Santa Margarita Quarry is located approximately four miles by road northeast of Santa Margarita in San Luis Obispo County, California. The site has been operating as an active quarry and aggregate processing facility since the 1920s.[1] Hanson mines granite and then processes it into aggregate through primary and secondary processing facilities located south of the main quarry pit. Hanson acquired the property from Kaiser Sand and Gravel circa 1994. The existing quarry within the 85-acre boundary is permitted by San Luis Obispo County to process 700,000 tons per year through the primary crusher.

1.2.2 Proposed Quarry Extension

The quarry pit is proposed to be extended to the northwest (Figures 1 and 2). The proposed scope is to add an additional 49 acres to the existing project boundary for a total proposed project area of 134 acres. The ultimate quarry pit floor will be approximately 880 feet above mean sea level (amsl). The proposed extension of the existing quarry will not change the existing boundaries or any of the current daily operations of the Santa Margarita Quarry.

1.3 Scope of Work

Golder conducted a hydrogeologic evaluation directed toward characterization of surface water and ground water conditions at the quarry. The general tasks conducted for the investigations are described below and in the following sections of this report:

- Research and compilation of published and unpublished literature pertaining to surface water and groundwater in the vicinity of the quarry
- Compilation and evaluation of site-specific geologic data from existing records

[1] Enviromine. 2012. Project Description for the Santa Margarita Quarry Extension (DRAFT). State Mine ID# 91-40-0003. January 13, 2012

- Sampling and chemical analysis of surface water samples from the quarry pit water and supply pond
- Development of a conceptual hydrogeological model using available site-specific geologic and hydrogeologic data to model existing conditions and to evaluate future mining activities
- Preparation of this report summarizing the findings, conclusions and recommendations of our investigation

1.4 Report Organization

The following sections of this report discuss the physical and geologic setting of the site, the general hydrologic and hydrogeologic conditions, and the geochemistry of the site surface water and groundwater. The body of the report is supported by appropriate figures, tables and appendices.

2.0 SITE SETTING

2.1 Topography

The quarry is located among steep hills and canyons east of the Santa Margarita Valley. Surrounding hills are up to 1480 ft high, and covered with oak woodland and chaparral. The Salinas River flows northeast, parallel to and about 130 feet east of the eastern portion of the quarry by the east haul road, then turns west and runs parallel to and north of the north boundary of the property (Figure 1). The current pit bottom is at an approximate elevation of 880 ft and is located approximately 450 feet from the Salinas River. The elevation of the Salinas River immediately east of the pit is approximately 940 feet, about 60 feet above the current and planned ultimate quarry bottom elevation.Crest elevations vary from 1318 ft on the west side of the pit, to 1010 ft on the east side of the pit between the pit floor and the Salinas River.

2.2 Geologic Setting

The quarry is located in Cretaceous granitic rocks at the southeast end of a ridge bordering the east side of the Santa Margarita Valley.[2] Across the valley to the west is the Santa Lucia Range, which consists of Tertiary sedimentary rocks. The granitic rocks of the quarry area and the sedimentary rocks in the Santa Lucia Range are separated by the Rinconada Fault, a regional northwest-southeast trending, right-lateral fault located approximately a mile west of the quarry. High angle faults that appear to be reverse faults crosscut the quarry parallel to the regional structural trend; one of these faults appears to be a splay of the Rinconada Fault (Figure 1).

2.2.1 Existing Pit Geology

Fresh rocks exposed in the quarry pit consist of medium-grained granite that is strong but moderately fractured. This strong fresh granite is capped by an approximately 50-ft thick zone of weathered granite, and 6-25 ft of decomposed granite at the surface. Numerous thin, steep faults and shears were observed in the pit walls during structural mapping.[3] The faults are generally about 2-3 inches thick and filled with clay or strongly clay-altered breccia and fault gouge. The faults generally dip southwest. A few shallow-dipping faults with similar infill characteristics were also observed. There are also several near-vertical, northeast-striking faults in the upper benches of the west wall. These larger-scale faults are generally about 2 to 3 feet wide but can be wider, and are filled with clay and strongly clay-altered fault breccia and gouge.

2.2.2 Extension Area Geology

Exploration core from the proposed extension area encountered fine- to coarse-grained porphyritic granite cut by faults. The faults range in thickness from 3-25 ft, and contain soft gouge and breccia. The

[2] Huffman. 2006. Geological Exploration of Old Anderson Tract (Santa Margarita Ranch). Internal report prepared for Hanson Aggregates. August 31, 2006.
[3] Golder Associates. 2008. Geotechnical Design Recommendations, Santa Margarita Quarry. Report prepared for Hanson Aggregates West Region. May 2008.

thickness of surficial weathered granite encountered ranged from 17-80 ft, but averaged about 50 ft. This material is generally granular with an estimated clay content of less than 6-8%. The granitic body targeted by the extension is bounded to the southwest by a large fault sub-parallel to the one that is believed to be a splay of the Rinconada fault (Figure 1).

2.2.3 Alluvium

Modern unconsolidated alluvial deposits are present along the active river channel of the Salinas River. These deposits are comprised of a poorly-sorted mixture of cobbles, gravels, sand, silt and clay and likely range from a few feet thick to tens of feet thick where the channel widens and deepens as it approaches the flatter terrain of the Paso Robles basin to the northwest.

2.3 Current Water Use

A small source water pond is located south of the main quarry pit, which is supplied by seepage of water into the pond from the Salinas River. Hanson occasionally supplements the seepage water with direct pumping from the River to the pond when necessary for adequate supply. Hanson uses approximately 300 acre feet per year (AFY) of water from this source pond for their crushing operations. According to Hanson personnel, approximately 90 percent of the 300 AFY is recycled to settling ponds while approximately 10 percent (30 AFY) is lost to use. Current water use from the source pond will not change as the quarry is extended. No process water is returned to the supply pond nor does Hanson reintroduce water from the quarry pit or process water directly into the Salinas River.

While Golder was on site in 2008 and 2011, water was also present at the bottom of the main quarry pit to an elevation of approximately 890 ft, with a total depth of approximately eight feet. According to quarry personnel, approximately 49 to 50 AFY of water is pulled from the quarry pit for dust suppression. Approximately 5 AFC may be pumped from the source water pond to supplement that available from the pit, for a total dust control usage of 50 to 55 AFY. Therefore the total amount of water extracted from the Salinas River in any given year may range up to approximately 306 AFY. For the quarry extension, it is estimated that an additional 2 to 3 AFY will be necessary for dust suppression. It is anticipated that this additional water will be obtained by pumping from the quarry pit.

3.0 HYDROGEOLOGIC DISCUSSION

3.1 Climate

The regional climate is Mediterranean characterized by two seasons consisting of dry, warm summers and mild, rainy winters. The majority of precipitation occurs between November and April. Average annual precipitation ranges from about 22 inches southeast of the site near the Salinas Dam, to 26 to 30 inches west of the site. The climate is also variable on an annual basis with dryer and wetter seasons from year to year.

3.2 Surface Water

The Salinas River flows northeast, parallel to and about 130 feet east of the east haul road, then turns west and runs parallel to and north of the north boundary of the property (Figure 1). The Salinas River generally flows year round according to quarry personnel except during the summer of notably dry years. The elevation of the Salinas River immediately east of the pit is approximately 940 feet, about 60 feet above the current and planned ultimate quarry bottom elevation. The following table summarizes stream flow data from 1975 to 1999 for the USGS Salinas River Stream Gauge Station, located downstream of Salinas Dam and Santa Margarita Lake, and approximately seven miles upstream of the Quarry:

	Salinas River (#8) Annual Flow		
	Acre-feet per year (AFY)	Cubic feet per second (cfs)	Year
Average Flow	23,126	31.9	1975-1999
Median Flow	3,380	4.7	1975-1999
Minimum Flow	729	1.0	1976
Maximum Flow	109,700	151.5	1998

Data from San Luis Obispo County Hydrologic Report, 5/16/05

3.3 Groundwater Occurrence

The quarry pit lies outside of the major groundwater basins in the area, as these groundwater basins are associated with the more permeable alluvial deposits overlying the basement rock, and not the granitic bedrock present at the quarry. The occurrence of groundwater in the granite is almost exclusively within secondary openings such as joints, fractures, shear zones and faults. Most published values for hydraulic conductivity of granite are in the range of 1×10^{-5} to 1×10^{-8} cm/sec depending on the degree of fracturing and weathering. Well yields in the granite are expected to be very low, in the range of a few gallons per minute (gpm) to tens of gpm and are restricted to domestic use.

In addition to the water ponded at the bottom of the pit to an elevation of approximately 890 ft, seeps were visible in the west wall of the quarry at elevations as high as 1100 feet, and in the east wall at approximately 1010 ft during Golder site visits. Previous reports indicate that no significant groundwater was encountered in the planned extension area during core drilling. Depth to groundwater is roughly estimated to be approximately 50 feet below ground surface within the pit although this likely varies both spatially and temporally.

3.4 Groundwater Flow Conditions

As noted previously, groundwater flow is preferentially within the alluvial units east of the quarry as compared to the bedrock granite where the quarry is located. The regional-scale direction of groundwater flow is interpreted to be from the southeast to the northwest toward the Paso Robles Groundwater Basin. Locally, groundwater flow is to the east and north toward the Salinas River with a component seeping into the quarry.

3.5 Water Balance Estimate

The primary goal of this task is to estimate a water balance for the quarry which entails and estimate of current and future groundwater seepage into the quarry, and contributions to the quarry from precipitation and surface water run-off.

3.5.1 Precipitation Data

The Santa Margarita precipitation gauge (sensor 73) maintained by the San Luis Obispo County Water Resources Division of Public Works indicates that the average rainfall is 26 inches per year. This station has been in operation since 1997, and is located approximately 2 miles west of the quarry. While this data is not from a station physically located within the quarry watershed, the data can be considered reasonably representative for the purpose of this water budget.

3.5.2 Storm Water Inflow Estimate

Surface water runoff to the quarry occurs from precipitation within the watershed of the pit and varies with storm intensity. However, an average runoff coefficient of 0.5 was estimated using the San Luis Obispo County Department of Public Works and Transportation rational method for runoff coefficients for undeveloped areas. This method factors in relief, soil infiltration, vegetative cover, and surface storage.

3.5.3 Groundwater Inflow for Current Condition

The annual groundwater inflow into the quarry pit was estimated from the following formula:

$$V_{GW} = V_{PITLAKE} + V_{PUMPED} + V_{EVAP} - V_{PRECIP} - V_{RUNOFF}$$

Where:

- V_{GW} is the total volume of groundwater entering the pit
- V_{PUMPED} is the volume of water pumped out of the pit (49 AFY)
- V_{PRECIP} is the volume of water from direct precipitation into the pit (26 inches per year)
- V_{EVAP} is the volume of water lost to evaporation based on the surface area of the pit water (79.9 inches per year from Santa Margarita Lake data, San Luis Obispo County)
- V_{RUNOFF} is the volume of water from runoff using the Quarry catchment area and a runoff coefficient of 0.5
- It was assumed the annual depth of the pit lake remained constant at 8 feet in depth

From the water balance, the average annual inflow of groundwater into the quarry pit under current conditions is approximately 15 AFY or about 9 gallons per minute.

3.5.4 Groundwater Inflow Estimate for Post-Mining Condition

A hydrogeologic evaluation was performed to estimate the potential increase in seepage associated with deepening and widening the pit as shown on Figure 2. Specifically, a steady state analytical solution (Marinelli and Niccoli, 2000) was utilized to evaluated potential seepage increases post mining (Appendix A).

The steady state analytical solution for current site conditions indicates that groundwater inflow into the pit is minimal. The current groundwater inflow was estimated to be less than 10 gpm, which is consistent with the results of the current water balance evaluation. Based on the results of the current condition, Golder then evaluated post-mining conditions. From this evaluation, we expect that deepening and widening of the pit will not result in a significant increase in groundwater inflow to the pit and that the groundwater inflow will remain less than 20 gpm. The main factors contributing to this results are that the mine will be deepened by only 40 feet (locally) and the hydraulic conductivity remains constant as the pit will still be located in granite. Therefore, the future mining of the extension area is estimated to result in an increase of groundwater seepage of approximately 10 gpm. In summary, because there is little in the way of storage of water within the granite, and because the granite exhibits little evidence of seepage along fractures, the future mining of the extension area is not anticipated to significantly increase seepage into the pit.

3.5.5 Water Balance Estimate for Post-Mining

By using the approach described in Section 3.1.3, the predicted future groundwater inflow into the pit, and the proposed final pit design, Golder estimated that a pit lake will likely not be present at the post-mining condition based on the following assumptions:

- The pit is not backfilled post-mining and the final grade is relatively level
- The final entire pit capture area is 3,237,300 square feet
- The final pit floor is approximately 1,500,000 square feet
- The runoff coefficient, annual evaporation rate, and annual precipitation value are constant relative to current conditions
- The permeability of the subsurface material between the expanded pit floor and the Salinas River is similar to current conditions and direct communication with the River does not occur

The main controlling factors limiting the formation of a pit lake are 1) the relatively minimal groundwater in-flow to the pit, 2) the large surface area of a potential pit lake compared to its depth, and 3) the evaporation rate being almost three times the precipitation rate. We anticipate that a transient pit lake will form following normal seasonal winter rainfall, however, during most normal rainfall years this temporary lake will evaporate over the course of the dry, hot summer and fall months. It is also possible that following a series of above normal rainfall years, that a small pit lake could persist through the summer. In summary, it is our opinion that the quarry will typically dry out on an annual basis, and will not fill to a height where surface discharge of pit water could occur to the Salinas River.

4.0 GEOCHEMICAL EVALUATION

4.1 Data Collection

Surface water samples were collected from the current pit pond, and the source water pond on November 21, 2011. Golder collected a total of two samples and submitted the samples under chain of custody to BC Laboratories, Inc. (BC Labs) in Bakersfield, California for analysis of geochemical parameters as well as metals. Golder also collected field parameters with a multi-meter at the time of sample collection. The analytical results from this single sampling event are presented on Table 1 and the laboratory reports are included as Appendix B.

4.2 Monitoring Results

The analytical results have been used to perform a simple geochemical assessment of the water from both ponds, and to provide a comparison to applicable regulatory limitations detailed in the Central Coast Regional Water Quality Control Board's (RWQCB) Basin Plan for the Central Coast Basin (RWQCB, 2011; Basin Plan).

Water from the rock-walled pit pond (pit pond) is an enriched solution containing elevated concentrations of dissolved ionic constituents; represented in analytical results by a high total dissolved solids (TDS) concentration, and in field measurements by a high electrical conductance (EC). The water type is classified as Mg-SO_4 due to magnesium and sulfate being the dominant cationic and anionic species. However, concentrations of the other major ions — calcium, chloride, potassium and sodium — are also significantly elevated, particularly in comparison with water contained in the nearby groundwater source pond (water supply pond). These major ions may generally be considered to act conservatively in natural environments, such that while individual concentrations may vary widely, the ratios of the ionic constituents remain relatively constant.

A piper diagram presented in Figure 3 provides a "fingerprint" of the ionic character of the water from both ponds at the quarry. The difference between the positions of the sample points on the Piper plot shows that although the concentrations of all major ionic constituents are elevated in pit pond water, the ratios of the ionic constituents also differs from the supply pond water, which is filled directly from the adjacent Salinas River. The unique geochemical "fingerprint" of the pit pond water therefore represents a combination of the effects of mineral leaching from the exposed pit walls, enrichment by evaporative losses, and possibly removal of major ions by the precipitation of secondary mineral phases containing ionic constituents (e.g. calcite).

Dissolved metals concentrations in the November 21, 2011 pit pond sample were generally very low, typically less than the analytical detection limits. This is expected for aluminum and iron, which have reduced solubility in the slightly alkaline water. However, aluminum, iron and zinc were detected in the

unfiltered water sample (as total concentrations), indicating solid forms of these metals were present, most likely as very fine-grained, poorly crystalline secondary mineral precipitates. The metal oxide precipitates of aluminum and iron are particularly effective at providing the capacity to adsorb (and therefore remove) other metals and metalloids, particularly arsenic, and nutrient elements such as phosphorous from the water. The amount of these particles that are present as suspended particles is low, with total suspended solids concentrations of less than 4 milligrams per Liter (mg/L) in both ponds.

To determine the geochemical effects of mineral leaching or evaporative enrichment occurring in pit pond water, saturation indices[4] of a large selection of minerals that may be commonly encountered in natural environments, and in mining-influenced settings were calculated using the publicly-available software package PHREEQC (Version 2.18.3), which was developed and is maintained by the U.S. Geological Survey (Parkhurst and Appelo, 1999). The saturation indices of mineral phases that are close to saturation or super-saturated in pond waters are shown in **Bold** type below.

Saturation indices of common minerals in pit and source pond water

Mineral	Formula	Pit Pond	Surface Pond
Ferrihydrite	$Fe(OH)_3$	**1.61**	**5.79**
Rhodochrosite	$MnCO_3$	-2.11	**-0.08**
Manganite	MnOOH	-2.31	**-0.27**
Gypsum	$CaSO_4{:}2H_2O$	-0.53	-1.70
Jarosite-H	$(H_3O)Fe_3(SO_4)_2(OH)_6$	-9.65	**0.65**
Jarosite-K	$KFe_3(SO_4)_2(OH)_6$	-2.51	**7.26**
Jarosite-Na	$NaFe_3(SO_4)_2(OH)_6$	-5.42	**4.78**
Calcite	$CaCO_3$	**0.33**	**0.40**
Dolomite	$CaMg(CO_3)_2$	**1.05**	**0.91**
Magnesite	$MgCO_3$	**-0.44**	-0.64

[4] The saturation index (SI) of water is defined as ratio of the ion activity product over the solubility product (Ksp) of a compound. Therefore, in water that is saturated with respect to certain mineral, such as calcium carbonate ($CaCO_3$) the $CaCO_3$, which is most likely to be present as the mineral calcite, it will neither dissolve, nor precipitate (SI=1). This equilibrium condition is based upon the water remaining undisturbed and at a constant temperature for an infinite period of time. Alternatively, water may be undersaturated with respect to a mineral species (SI<1) and if is present, will most likely dissolve until saturation is reached. As the saturation level increases beyond 1, the driving force for formation of mineral precipitates or crystal growth increases.

Mineral	Formula	Pit Pond	Surface Pond
Barite	$BaSO_4$	**0.70**	**0.05**
Cerrusite	$PbCO_3$	-1.0	-1.05

Note: Saturation indices greater than -0.5 are shown in **bold** and indicate the water is near equilibrium with respect to the mineral phase, or likely to precipitate the mineral over time given suitable conditions.

Pit pond water is either near saturation or super-saturated with respect to the carbonate mineral phases calcite, dolomite and magnesite, which indicates that dissolution of readily soluble carbonate minerals may have occurred, and saturation increased with the aid of enrichment by evaporation. The pit pond water is also super-saturated with respect to ferrihydrite, however, given the near-neutral pH and the low concentration of dissolved iron in the water it is unlikely that significant ferrihydrite precipitation would occur. With a high concentration of sulfate, the pit pond water is also near saturation with respect to the minerals gypsum (slightly below saturation) and barite (at saturation).

The source pond is filled by seepage (i.e., in-flow) of water directly from the Salinas River. Occasionally, river water is pumped directly into the pond to supplement the natural seepage. Consequently, the water within the pond is expected to predominantly reflect the composition of the Salinas River water, although, the pond also receives some direct precipitation and minor stormwater runoff from adjacent catchment areas that drain into the pond. It is our understanding from site personnel that no water from the source water pond is discharged back to the River.

The TDS concentration of the sample obtained from the source pond water was significantly lower than that of the pit pond, and dominated by the major ionic constituents calcium and bicarbonate (Ca-HCO_3 water type). The concentrations of metals and metalloids boron, iron, manganese and silicon were higher in the source pond than the pit pond, however, water quality data was not available for the Salinas River to verify if these constituent concentrations were consistent with the water source. A number of mineral phases in source pond water were determined to be near, or at saturation, and were generally similar to the pit pond, with hydroxides ferrihydrite and manganite; carbonates rhodochrosite, calcite and dolomite and various forms of jarosite all near saturation.

4.3 Comparison of Water Quality to Regulatory Standards

The closest surface water is the adjacent Salinas River, located immediately east and north of the quarry boundary. The beneficial uses of the Salinas River in the corresponding reach between the San Margarita Reservoir and the Naciamento River are listed in the Basin Plan for the Central Coast Region[5] as: MUN,

[5] Regional Water Quality Control Board. 2011: Water Quality Control Plan for the Central Coastal Basin. Central Coast Region. June 2011

AGR, PRO, GWR, REC1, REC2, WILD, COLD, WARM, MIGR, SPWN, RARE and COMM. The water quality objectives for the protection of municipal water supplies, agricultural water use (irrigation) and aquatic life are listed on Table 1 for comparison purposes.

Low concentrations of metals were measured in samples from both ponds, generally below the analytical detection limits and consequently also the numerical water quality limitations assessed. The concentration of total iron in the source pond exceeded the California Secondary Maximum Contaminant Limitation (MCL) value for domestic supply; however this value is based upon aesthetic and taste criteria and does not indicate toxicity at this level. Although water quality data for the Salinas River was not available for comparison, this likely reflects total iron concentrations that occur naturally in the Salinas River associated with suspended solids (i.e., fine particulate matter). Dissolved iron was not detected in either of the two ponds.

5.0 SUMMARY

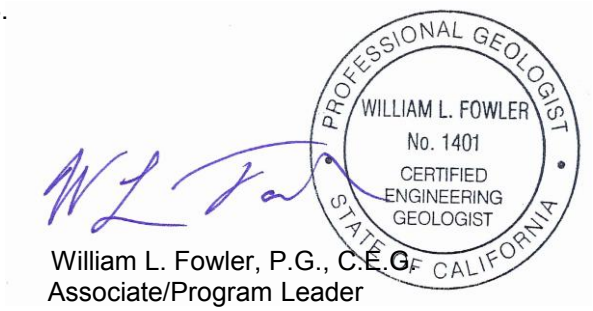
Based on this hydrogeological evaluation, Golder concludes the following:

- We do not anticipate any potential impacts to beneficial uses of groundwater associated with the quarry extension project. The quarry pit is not located within a major groundwater basin. The primary groundwater basins are associated with the more permeable alluvial deposits located east of the quarry as opposed to the granitic bedrock present at the quarry, and based on available information, there is minimal domestic use of the granitic aquifer in the vicinity of the quarry. The occurrence of groundwater in the granite is exclusively within secondary openings such as joints, fractures, shear zones and faults. Well yields in the granite are expected to be very low, in the range of a few gallons per minute (gpm) to tens of gpm and are restricted to local domestic use.
- Water balance and steady state analytical solutions for current and post-mining site conditions indicate that current and future groundwater inflow into the pit is minimal.
- Based on available data, a pit lake is not likely to be present at post-mining conditions assuming the expanded pit does not develop direct hydraulic communication with the Salinas River beyond that currently observed. However, it is anticipated that seasonal ponding will occur at the post-mining quarry floor and that, in normal rainfall years, the majority of the ponding will evaporate during over the dry summer and fall months (i.e. May through October). No surface discharge of ponded water from the quarry pit is anticipated based on the water balance estimate.
- The current pit pond water is different in geochemical character than the source pond water. The pit pond water is a mixture of groundwater seepage and storm water runoff. The source pond fills from subsurface seepage of Salinas River water into the pond and is inferred to be representative of the general geochemical character of surface water in the River. There is no surface discharge from either the pit pond or the source water pond to the River.
- The geochemistry of pit pond water is a combination of the effects of mineral leaching from the exposed pit walls, enrichment by evaporative losses and possibly removal of major ions by the precipitation of secondary mineral phases containing ionic constituents (e.g. calcite).
- Low concentrations of metals were measured in samples from both ponds, generally below the analytical detection limits, and consequently also the numerical water quality guidelines for the Central Coast Basin Plan. The only noted exceedance of water quality guidelines is the concentration of total iron in the source pond which exceeded the California Secondary MCL value for domestic supply; however, this value is based upon aesthetic and taste criteria and does not indicate toxicity at this level. This likely reflects naturally occurring water quality in the Salinas River associated with fine particulate matter (i.e., suspended solids). Dissolved iron was not detected in either of the two ponds.

6.0 CLOSING

We appreciate the opportunity to assist Lehigh Hanson with this project. If you questions, please do not hesitate to call either of the undersigned at 408-220-9223.

GOLDER ASSOCIATES INC.



George C. Wegmann
Senior Geologist

William L. Fowler, P.G., C.E.G.
Associate/Program Leader

TABLES

Table 1 - Water Quality Sampling Results
Hydrogeologic Evaluation
Santa Margarita Quarry

Sample Location:		**Pit Pond**			**Supply Pond**			Inorganic Concentrations not to be exceeded in Domestic or Municipal Supply[1]	Toxic Metal Concentration not to be exceeded in Aquatic Life Habitats[2]	Water Quality Objectives for Agricultural Water Use[3]
Sample Date:		11/21/2011			11/21/2011					
Analyte:	Unit:	Result:	Lab qualifier:	MDL	Result:	Lab qualifier:	MDL			
Alkalinity, Total	mg/L	85	D	8.2	150		4.1			
Bicarbonate	mg/L	100	D	10	190		5			
Calcium, dissolved	mg/L	200		0.018	51		0.018			
Calcium, total	mg/L	200		0.023	50		0.023			
Carbonate (CO3)	mg/L	< 5.0	D	5	< 2.5		2.5			
Chloride	mg/L	27	B	0.066	14	B	0.066			
Fluoride	mg/L	0.66	D	0.024	0.29		0.012	2,000[a]		1,000
Hardness	mg/L	1,300		0.1	250		0.1			
Magnesium, dissolved	mg/L	200		0.016	29		0.016			
Magnesium, total	mg/L	210		0.016	29		0.016			
Phosphorus	mg/L	< 0.016		0.016	0.016	J	0.016			
Potassium, dissolved	mg/L	18		0.14	3.5		0.1			
Potassium total	mg/L	17		0.1	3.3		0.14			
Sodium, total	mg/L	57	B	0.077	24	B	0.077			
Sodium, dissolved	mg/L	51		0.05	27		0.05			
Sulfate	mg/L	1,300	D	0.6	110		0.12	250,000[a]		
Sulfide	mg/L	< 0.050		0.05	< 0.050		0.05			
Total Dissolved Solids	mg/L	1,300	D	100	460	D	20			
Total Suspended Solids	mg/L	4	D	1.1	3.4	D	1.1			
Turbidity	ntu	3		0.1	3.5		0.1			
pH	pH units	7.87		0.05	8.0		0.05	<6.5; >8.3		
Electrical Conductance	µmhos/cm	2,120		1	554		1			
Aluminum, dissolved	µg/L	< 26		26	< 26		26			
Aluminum, total	µg/L	110		39	200		39	1,000		5,000
Arsenic, dissolved	µg/L	< 7.5		7.5	< 7.5		7.5			
Arsenic, total	µg/L	< 9.8		9.8	< 9.8		9.8	50		100
Barium, dissolved	µg/L	33		1.2	38		1.0			
Barium, total	µg/L	36		1.0	37		1.2	1,000		
Beryllium, dissolved	µg/L	< 1.0		1.0	< 1.0		1.0			
Beryllium, total	µg/L	< 1.0		1.0	< 1.0		1.0	4[a]		
Boron, dissolved	µg/L	17	J	10	58	J	10			
Boron, total	µg/L	22	J	10	48	J	10			750
Cadmium, dissolved	µg/L	< 1.0		1.0	< 1.0		1.0			
Cadmium, total	µg/L	< 1.0		1.0	< 1.0		1.0	10	30	100
Copper, dissolved	µg/L	< 2.3		2.3	< 2.3		2.3			
Copper, total	µg/L	< 2.3		2.3	< 2.3		2.3	1,000[a]	30	200
Hexavalent Chromium	µg/L	< 0.70		0.7	< 0.70		0.7			
Iron, dissolved	µg/L	< 5.0		5.0	31	J	6.7			
Iron, total	µg/L	210		6.7	**370**	J	5.0	300[a]		5,000
Lead, dissolved	µg/L	7.6	J	5	5.2	J	5.0			
Lead, total	µg/L	6.0	J	5.0	< 5.0		5.0	50	30	5,000
Manganese, dissolved	µg/L	8.5	J	1	190		1.0			

Table 1 - Water Quality Sampling Results
Hydrogeologic Evaluation
Santa Margarita Quarry

Sample Location:		**Pit Pond**			**Supply Pond**			Inorganic Concentrations not to be exceeded in Domestic or Municipal Supply[1]	Toxic Metal Concentration not to be exceeded in Aquatic Life Habitats[2]	Water Quality Objectives for Agricultural Water Use[3]
Sample Date:		11/21/2011			11/21/2011					
Analyte:	Unit:	Result:	Lab qualifier:	MDL	Result:	Lab qualifier:	MDL			
Manganese, total	µg/L	16		1.0	190		1.0	50[a]		200
Mercury, dissolved	µg/L	< 0.030		0.030	< 0.030		0.03			
Mercury, total	µg/L	< 0.030		0.030	< 0.030		0.03	2	0	
Molybdenum, dissolved	µg/L	23	J	5	< 5.0		5.0			
Molybdenum, total	µg/L	25	J	5.0	< 5.0		5.0			10
Nickel, dissolved	µg/L	< 1.2		1.2	< 1.2		1.2			
Nickel, total	µg/L	< 1.2		1.2	1.2	J	1.2	10	400	200
Selenium, dissolved	µg/L	< 11		11	< 15		15			
Selenium, total	µg/L	< 15		15	< 11		11	10		20
Silicon	µg/L	2,200		10	5,700		10			
Silver, dissolved	µg/L	< 1.1		1.1	< 1.1		1.1			
Silver, total	µg/L	< 1.0		1	< 1.0		1.0	50		
Thallium, dissolved	µg/L	< 15		15	< 15		15			
Thallium, total	µg/L	< 17		17	< 17		17			
Zinc, dissolved	µg/L	< 5.9		5.9	< 5.9		5.9			
Zinc, total	µg/L	7.7	B,J	2.9	< 2.9	B	2.9		200	2,000

Notes:

1 = Criteria from CENTRAL COAST BASIN WATER QUALITY CONTROL PLAN (BASIN PLAN), Table 3.2; where no values supplied in basin plan, California Primary or Secondary MCL for MUN supply (a).

2 = Criteria from CENTRAL COAST BASIN WATER QUALITY CONTROL PLAN (BASIN PLAN), Table 3.5

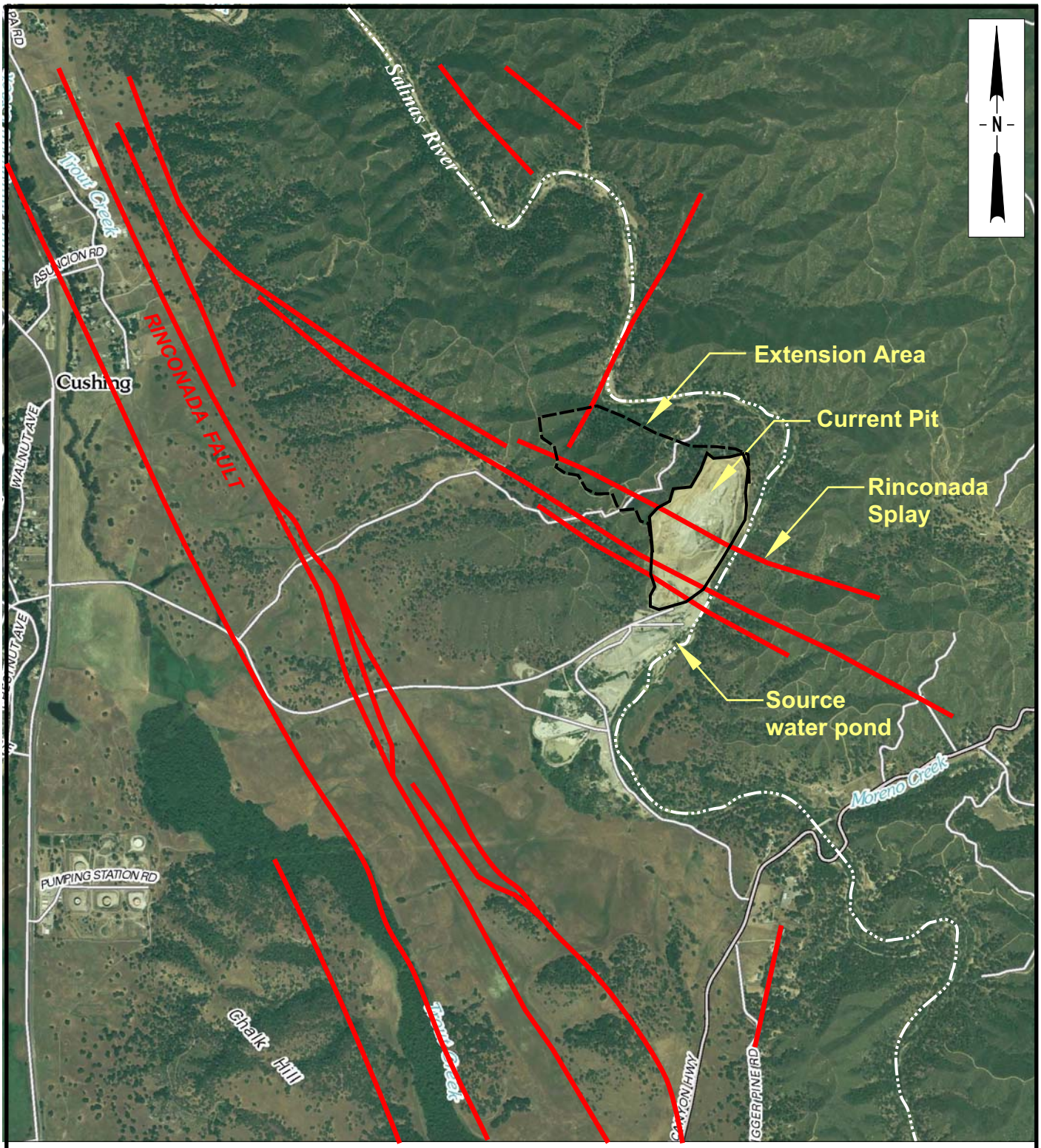
For Cd, Cu, Pb, Ni, Ag, Zn are based on hardness values, baseline criteria listed use hardness >100 mg/L CaC03.

3 = Criteria from CENTRAL COAST BASIN WATER QUALITY CONTROL PLAN (BASIN PLAN), Table 3.4

J = estimated value below laboratory reporting limit

B = detected in blank sample.

FIGURES



FAULT

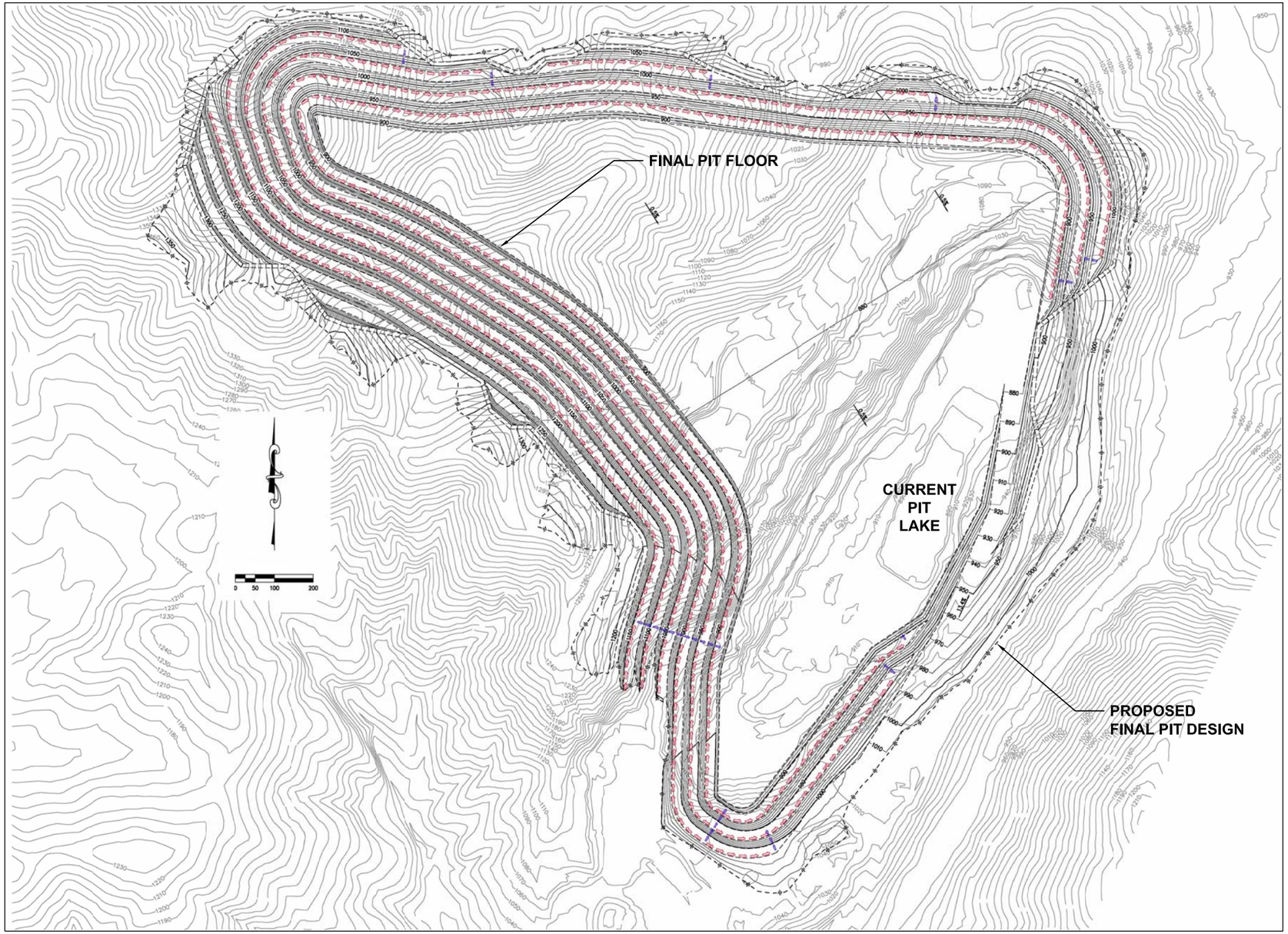
Base map from USGS 7.5' Ortho Quad. Map: Santa Margarita, Calif.; 2009.

SCALE: 0 2000 4000 FEET

(APPROXIMATE)

Golder Associates	HANSON SANTA MARGARITA QUARRY EXTENSION SANTA MARGARITA, CALIFORNIA	FIGURE 1
	SITE LOCATION	PROJECT NO. 073-97199

G:\073-97199\Fig 1-Site Vicinity.DSF 2/612



300 0 300
SCALE FEET

Golder Associates
Sunnyvale, California

FILE No.	073-97199		
PROJECT No.	073-97199	REV.	0

SCALE	AS SHOWN
DATE	2/6/12
DESIGN	GW
CADD	KMM
CHECK	GW
REVIEW	WLF

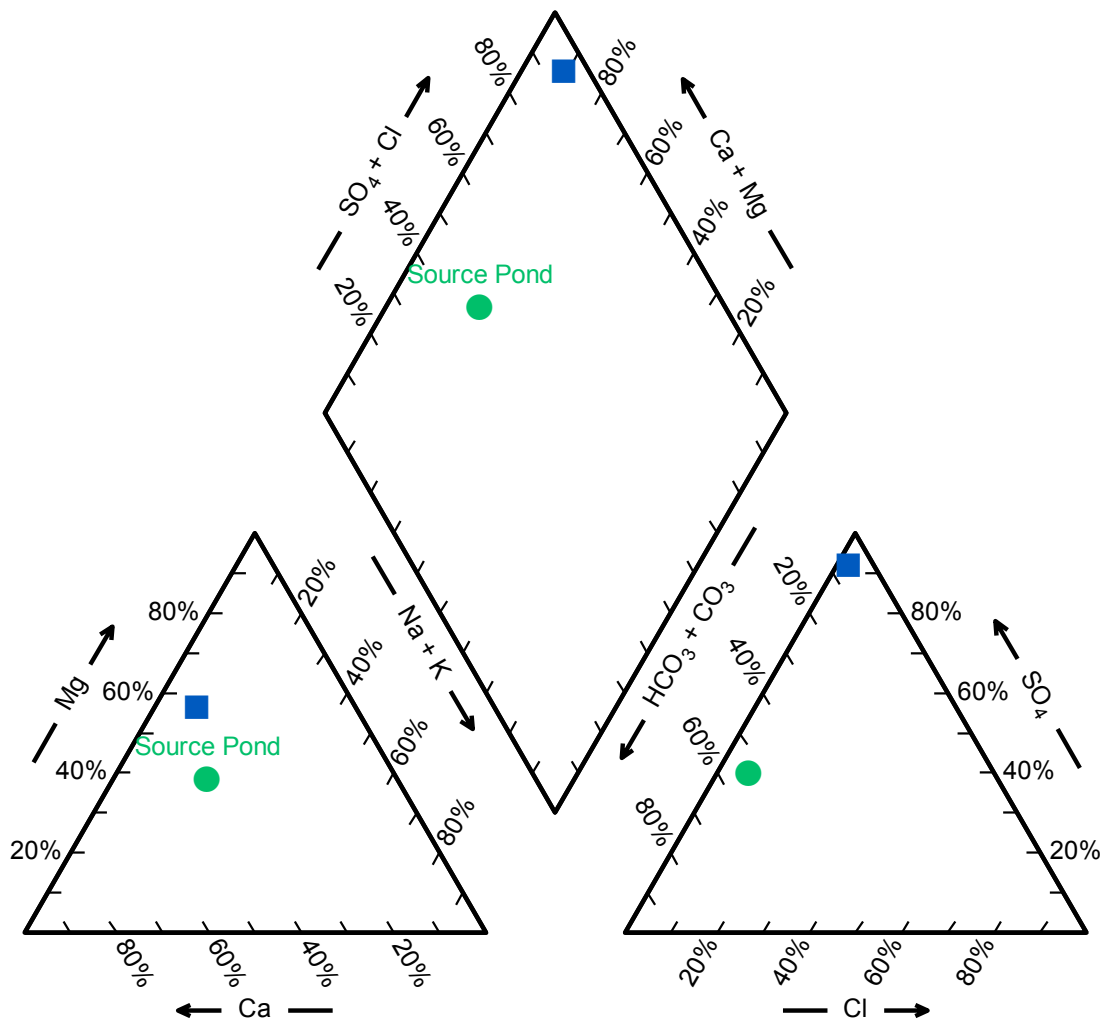
TITLE

HANSON
SANTA MARGARITA QUARRY EXTENSION
SITE PLAN

LEHIGH HANSON

FIGURE 2

Drawing file: Final Pit bottom.dwg Feb 06, 2012 – 3:28pm



Golder Associates

Santa Margarita Quarry

Piper Plot - Source Pond and Pit Pond

PROJECT NUMBER: 073-97199

DATE: January 23, 2011

FIGURE NO.: 3

APPENDIX A
Steady-State Groundwater Inflow Calculations

Inflow to the Open Pit (1) - Existing Condition
Based on Equations by Marinelli and Niccoli (2000)

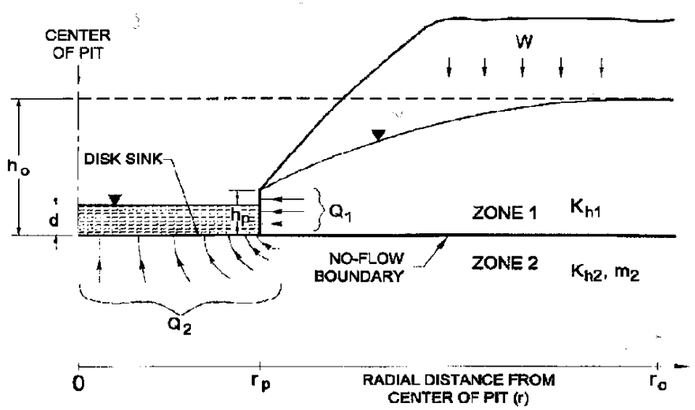


Figure 2. Pit inflow analytical model.

Marinelli, F., and W. L. Niccoli. 2000. Simple analytical equations for estimating ground water inflow to a mine pit. Ground Water 38, no. 2: 311-314.

(A) $$h_o = \sqrt{h_p^{\,2} + \frac{W}{K_{h1}}\left[r_o^2 \ln\left(\frac{r_o}{r_p}\right) - \frac{\left(r_o^2 - r_p^2\right)}{2}\right]},$$

(B) $$Q_1 = W\pi\left(r_o^2 - r_p^2\right),$$

(C) $$Q_2 = 4r_p\left(\frac{K_{h2}}{m_2}\right)\left(h_0 - d\right),$$

(D) $$m_2 = \sqrt{\frac{K_{h2}}{K_{v2}}}$$

Input Parameters

W (m/s)	2.41468E-09	recharge flux
Kh1 (m/s)	0.00000001	horizontal hydraulic conductivity in Zone 1
Kh2 (m/s)	0.00000001	horizontal hydraulic conductivity in Zone 2
Kv2 (m/s)	0.000000005	vertical hydraulic conductivity in Zone 2
ho (m)	106.6803217	initial saturated thickness above the base of Zone 1
hp (m)	3.048009193	saturated thickness at the pit wall
rp (m)	45.72013789	effective pit radius
d (m)	2.438407354	depth of the pit lake

Inflow to the Open Pit (2)
Based on Equations by Marinelli and Niccoli (2000)

Inflow from Zone 1

ro (m)	211.4	radius of influence calculated by iterating equation A

(known ho)		(ho calculated using eq. A)
106.7	=	106.7

Q1 (m3/s)	3.2E-04	pit inflow from Zone 1 calculated using equation B
Q1 (m3/day)	27.9	
Q1 (USgpm)	5.1	

Inflow from Zone 2

m2	1.414213562	anisotropy parameter calculated using equation D
Q2 (m3/s)	1.3E-04	pit inflow from Zone 2 calculated using equation C
Q2 (m3/day)	11.6	
Q2 (USgpm)	2.1	

Total Pit Inflow

Q (m3/s)	4.6E-04
Q (m3/day)	39.6
Q (USgpm)	7.3

Inflow to the Open Pit (1) - Post-Mining Condition
Based on Equations by Marinelli and Niccoli (2000)

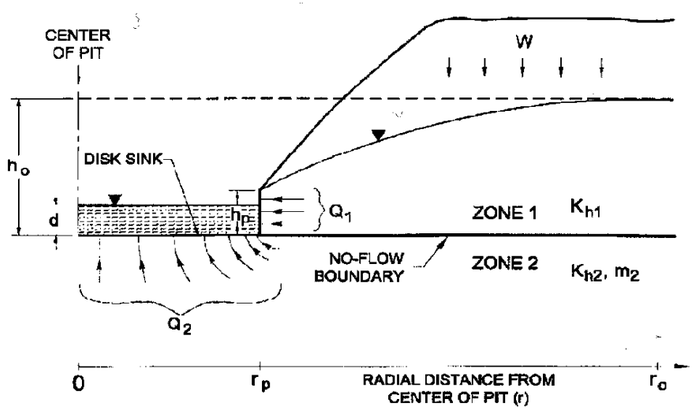


Figure 2. Pit inflow analytical model.

Marinelli, F., and W. L. Niccoli. 2000. Simple analytical equations for estimating ground water inflow to a mine pit. Ground Water 38, no. 2: 311-314.

(A) $$h_o = \sqrt{h_p^{\,2} + \frac{W}{K_{h1}}\left[r_o^2 \ln\left(\frac{r_o}{r_p}\right) - \frac{\left(r_o^2 - r_p^2\right)}{2}\right]},$$

(B) $$Q_1 = W\pi\left(r_o^2 - r_p^2\right),$$

(C) $$Q_2 = 4r_p\left(\frac{K_{h2}}{m_2}\right)\left(h_0 - d\right),$$

(D) $$m_2 = \sqrt{\frac{K_{h2}}{K_{v2}}}$$

Input Parameters

W (m/s)	2.41468E-09	recharge flux
Kh1 (m/s)	0.00000001	horizontal hydraulic conductivity in Zone 1
Kh2 (m/s)	0.00000001	horizontal hydraulic conductivity in Zone 2
Kv2 (m/s)	0.000000005	vertical hydraulic conductivity in Zone 2
ho (m)	115.8243493	initial saturated thickness above the base of Zone 1
hp (m)	7.620022982	saturated thickness at the pit wall
rp (m)	121.9203677	effective pit radius
d (m)	0.609601839	depth of the pit lake

Inflow to the Open Pit (2)
Based on Equations by Marinelli and Niccoli (2000)

Inflow from Zone 1

ro (m)	320.5	radius of influence calculated by iterating equation A

(known ho)		(ho calculated using eq. A)
115.8	=	115.9

Q1 (m3/s)	6.7E-04	pit inflow from Zone 1 calculated using equation B
Q1 (m3/day)	57.6	
Q1 (USgpm)	10.6	

Inflow from Zone 2

m2	1.414213562	anisotropy parameter calculated using equation D
Q2 (m3/s)	4.0E-04	pit inflow from Zone 2 calculated using equation C
Q2 (m3/day)	34.3	
Q2 (USgpm)	6.3	

Total Pit Inflow

Q (m3/s)	1.1E-03
Q (m3/day)	91.9
Q (USgpm)	16.9

APPENDIX B
Laboratory Reports

Date of Report: 12/12/2011

Bill Fowler

Golder Associates
425 Lakeside Drive
Sunnyvale, CA 94085

Project: Santa Margarita
BC Work Order: 1119270
Invoice ID: B112928

Enclosed are the results of analyses for samples received by the laboratory on 11/21/2011. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Linda Phoudamneun

Contact Person: Linda Phoudamneun
Client Service Rep

Authorized Signature

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Golder Associates
CHAIN OF CUSTODY

Golder Associates 11-19270

Page 1 of 1

Quotation No.

PROJECT NO.: # 0739 7199

SITE NAME: Santa Mary Quarry

SAMPLER(S): Denise Masm (printed) (signature)

CONTRACT LABORATORY: BC LAB

TURN-AROUND TIME: Normal

ANALYSES: See attached sheet

EDD required? ☑ Yes ☐ No

EDF required? ☐ Yes ☐ No

Sample I.D.	Lab I.D.	Collection Date	Collection Time	Matrix	Depth	Container Info: Type/Vol.	Filter	Preserv.	Cont. Qty.	Remarks
(1) SUPPLY POND	-1	11/21/11	12:45	H_2O	—	Pt: 3; Pt: 1; Pt: 1; Pt: 1; Pt Amb.: 1	Ø; Ø; Y; Ø; Ø	Ø; ZnAc; HNO_3; HNO_3; Ø	(7)	* Add presume for phosphorous Total (See attached Sheet)
(2) PIT POND	-2	11/21/11	12:15	H_2O	—	2; 1; 1; 1; 1			(6)	

SHORT HOLDING TIME: Cr^{+6} NO_2 NO_3 OP SS DO Cl_2 BOD MBAS COT

CHK BY: HR

DISTRIBUTION: WM WM

SUB-OUT ☐

Relinquished by: (signature)	Received by: (signature)	Date/Time:
		11-21-11 1350
Relinquished by: (signature) 11-21-11 2204	Received by: (signature)	Date/Time: 11-21-11 2205
Relinquished by: (signature)	Received by: (signature)	Date/Time:

SEND RESULTS TO:
Attn: BILL FOWLER
Golder Associates Inc.
425 Lakeside Drive
Sunnyvale, CA 94085
Phone (408) 220-9223
Fax (408) 220-9224

white: lab copy yellow: project file

Chain of Custody and Cooler Receipt Form for 1119270 Page 1 of 2

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.
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4100 Atlas Court Bakersfield, CA 93308 (661) 327-4911 FAX (661) 327-1918 www.bclabs.com

Chain of Custody and Cooler Receipt Form for 1119270 Page 2 of 2

BC LABORATORIES INC. SAMPLE RECEIPT FORM Rev. No. 12 06/24/08 Page 1 Of 1

Submission #: 11-19270

SHIPPING INFORMATION
Federal Express ☐ UPS ☐ Hand Delivery ☐
BC Lab Field Service ☒ Other ☐ (Specify)_____

SHIPPING CONTAINER
Ice Chest ☒ None ☐
Box ☐ Other ☐ (Specify)_____

Refrigerant: Ice ☒ Blue Ice ☐ None ☐ Other ☐ Comments:

Custody Seals Ice Chest ☐ Intact? Yes ☐ No ☐ Containers ☐ Intact? Yes ☐ No ☐ None ☒ Comments:

All samples received? Yes ☒ No ☐ All samples containers intact? Yes ☒ No ☐ Description(s) match COC? ~~Yes ☐~~ No ☐

COC Received ☒ YES ☐ NO

Emissivity: .98 Container: Pile Thermometer ID: 177
Temperature: A 1.0 °C / C 1.3 °C

Date/Time 11-21-11 2205
Analyst Init BLT

SAMPLE CONTAINERS	SAMPLE NUMBERS 1	2	3	4	5	6	7	8	9	10
QT GENERAL MINERAL/ GENERAL PHYSICAL										
PT PE UNPRESERVED	A,B,C	A B								
QT INORGANIC CHEMICAL METALS										
PT INORGANIC CHEMICAL METALS	D E	C								
PT CYANIDE										
PT NITROGEN FORMS										
PT TOTAL SULFIDE	F	D								
2oz. NITRATE / NITRITE										
PT TOTAL ORGANIC CARBON										
PT TOX										
PT CHEMICAL OXYGEN DEMAND										
PtA PHENOLICS										
40ml VOA VIAL TRAVEL BLANK										
40ml VOA VIAL	( )	( )	( )	( )	( )	( )	( )	( )	( )	( )
QT EPA 413.1, 413.2, 418.1										
PT ODOR										
RADIOLOGICAL										
BACTERIOLOGICAL										
40 ml VOA VIAL- 504										
QT EPA 508/608/8080										
QT EPA 515.1/8150										
QT EPA 525										
QT EPA 525 TRAVEL BLANK										
100ml EPA 547										
100ml EPA 531.1										
QT EPA 548										
QT EPA 549										
QT EPA 632										
QT EPA 8015M										
~~QT AMBER~~ PtAmber	G	E								
8 OZ. JAR										
32 OZ. JAR										
SOIL SLEEVE										
PCB VIAL										
PLASTIC BAG										
FERROUS IRON										
ENCORE										

Comments:
Sample Numbering Completed By: [illegible] Date/Time: 11/22/11 0859
A = Actual / C = Corrected
[H:\DOCS\WP80\LAB_DOCS\FORMS\SAMREC2.WPD]

Golder Associates 425 Lakeside Drive Sunnyvale, CA 94085	**Reported:** 12/12/2011 15:18 Project: Santa Margarita Project Number: 07397199 Project Manager: Bill Fowler

Laboratory / Client Sample Cross Reference

Laboratory	Client Sample Information			
1119270-01	**COC Number:**	---	**Receive Date:**	11/21/2011 22:05
	Project Number:	---	**Sampling Date:**	11/21/2011 12:45
	Sampling Location:	Santa Margarita	**Sample Depth:**	---
	Sampling Point:	Supply Pond	**Lab Matrix:**	Water
	Sampled By:	Denise Mason	**Sample Type:**	Water
			Metal Analysis:	1-Field Filtered and Acidified
1119270-02	**COC Number:**	---	**Receive Date:**	11/21/2011 22:05
	Project Number:	---	**Sampling Date:**	11/21/2011 12:15
	Sampling Location:	Santa Margarita	**Sample Depth:**	---
	Sampling Point:	Pit Pond	**Lab Matrix:**	Water
	Sampled By:	Denise Mason	**Sample Type:**	Water
			Metal Analysis:	1-Field Filtered and Acidified

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Golder Associates
425 Lakeside Drive
Sunnyvale, CA 94085

Reported: 12/12/2011 15:18
Project: Santa Margarita
Project Number: 07397199
Project Manager: Bill Fowler

Water Analysis (General Chemistry)

BCL Sample ID: 1119270-01 | **Client Sample Name:** Santa Margarita, Supply Pond, 11/21/2011 12:45:00PM, Denise Mason

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Dissolved Calcium	**51**	**mg/L**	**0.10**	**0.018**	**EPA-6010B**	ND		1
Total Calcium	**50**	**mg/L**	**0.10**	**0.023**	**EPA-6010B**	ND		2
Dissolved Magnesium	**29**	**mg/L**	**0.050**	**0.016**	**EPA-6010B**	ND		1
Total Magnesium	**29**	**mg/L**	**0.050**	**0.016**	**EPA-6010B**	ND		2
Dissolved Sodium	**27**	**mg/L**	**0.50**	**0.050**	**EPA-6010B**	0.20		1
Total Sodium	**24**	**mg/L**	**0.50**	**0.077**	**EPA-6010B**	ND		2
Dissolved Potassium	**3.5**	**mg/L**	**1.0**	**0.10**	**EPA-6010B**	ND		1
Total Potassium	**3.3**	**mg/L**	**1.0**	**0.14**	**EPA-6010B**	ND		2
Bicarbonate	**190**	**mg/L**	**5.0**	**5.0**	**EPA-310.1**	ND		3
Carbonate	ND	mg/L	2.5	2.5	EPA-310.1	ND		3
Total Alkalinity as CaCO3	**150**	**mg/L**	**4.1**	**4.1**	**EPA-310.1**	ND		3
Chloride	**14**	**mg/L**	**0.50**	**0.066**	**EPA-300.0**	0.19		4
Fluoride	**0.29**	**mg/L**	**0.050**	**0.012**	**EPA-300.0**	ND		4
Sulfate	**110**	**mg/L**	**1.0**	**0.12**	**EPA-300.0**	ND		4
Dissolved Hardness as CaCO3	**250**	**mg/L**	**0.50**	**0.10**	**Calc**	ND		5
Hardness as CaCO3	**240**	**mg/L**	**0.50**	**0.10**	**Calc**	ND		5
pH	**8.00**	**pH Units**	**0.05**	**0.05**	**EPA-150.1**		**S05**	6
Electrical Conductivity @ 25 C	**554**	**umhos/cm**	**1.00**	**1.00**	**EPA-120.1**			7
Total Dissolved Solids @ 180 C	**460**	**mg/L**	**20**	**20**	**EPA-160.1**	ND		8
Total Suspended Solids (Glass Fiber)	**3.4**	**mg/L**	**1.1**	**1.1**	**EPA-160.2**	ND		9
Turbidity	**3.5**	**NT Units**	**0.10**	**0.10**	**EPA-180.1**			10
Total Phosphorus	**0.016**	**mg/L**	**0.050**	**0.016**	**EPA-365.4**	ND	**J**	11
Total Sulfide	ND	mg/L	0.10	0.050	EPA-376.2	ND		12

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Golder Associates
425 Lakeside Drive
Sunnyvale, CA 94085

Reported: 12/12/2011 15:18
Project: Santa Margarita
Project Number: 07397199
Project Manager: Bill Fowler

Water Analysis (General Chemistry)

BCL Sample ID: 1119270-01 | **Client Sample Name:** Santa Margarita, Supply Pond, 11/21/2011 12:45:00PM, Denise Mason

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-6010B	11/21/11	11/23/11 08:48	ARD	PE-OP1	1	BUK1653
2	EPA-6010B	12/01/11	12/02/11 09:53	ARD	PE-OP1	1	BUL0056
3	EPA-310.1	12/05/11	12/05/11 16:02	RML	MET-1	1	BUL0223
4	EPA-300.0	11/23/11	11/23/11 15:21	AKB	IC2	1	BUK1723
5	Calc	11/23/11	12/07/11 17:07	TMS	Calc	1	BUK1752
6	EPA-150.1	12/05/11	12/05/11 16:02	RML	MET-1	1	BUL0223
7	EPA-120.1	12/05/11	12/05/11 16:02	RML	MET-1	1	BUL0223
8	EPA-160.1	11/23/11	11/23/11 10:00	JES	MANUAL	2	BUK1779
9	EPA-160.2	11/23/11	11/23/11 12:45	CAD	MANUAL	2.273	BUK2004
10	EPA-180.1	11/23/11	11/23/11 12:00	CAM	MANUAL	1	BUL0397
11	EPA-365.4	12/01/11	12/05/11 16:14	SDU	SC-1	1	BUL0041
12	EPA-376.2	11/23/11	11/23/11 13:30	DIW	SPEC05	1	BUK2112

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Golder Associates
425 Lakeside Drive
Sunnyvale, CA 94085

Reported: 12/12/2011 15:18
Project: Santa Margarita
Project Number: 07397199
Project Manager: Bill Fowler

Water Analysis (Metals)

BCL Sample ID: 1119270-01 | **Client Sample Name:** Santa Margarita, Supply Pond, 11/21/2011 12:45:00PM, Denise Mason

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Dissolved Aluminum	ND	ug/L	50	26	EPA-6010B	ND		1
Dissolved Antimony	ND	ug/L	100	10	EPA-6010B	ND		1
Dissolved Arsenic	ND	ug/L	50	7.5	EPA-6010B	ND		1
Hexavalent Chromium	ND	ug/L	2.0	0.70	EPA-7196	ND	Z1	2
Dissolved Barium	**37**	**ug/L**	**10**	**1.2**	**EPA-6010B**	ND		1
Dissolved Beryllium	ND	ug/L	10	1.0	EPA-6010B	ND		1
Dissolved Boron	**48**	**ug/L**	**100**	**10**	**EPA-6010B**	ND	**J**	1
Dissolved Cadmium	ND	ug/L	10	1.0	EPA-6010B	ND		1
Dissolved Chromium	ND	ug/L	10	1.0	EPA-6010B	ND		1
Dissolved Copper	ND	ug/L	10	2.3	EPA-6010B	ND		1
Dissolved Iron	**31**	**ug/L**	**50**	**5.0**	**EPA-6010B**	ND	**J**	1
Dissolved Lead	**5.2**	**ug/L**	**50**	**5.0**	**EPA-6010B**	ND	**J**	1
Dissolved Manganese	**190**	**ug/L**	**10**	**1.0**	**EPA-6010B**	ND		1
Dissolved Mercury	ND	ug/L	0.20	0.030	EPA-7470A	ND		3
Dissolved Molybdenum	ND	ug/L	50	5.0	EPA-6010B	ND		1
Dissolved Nickel	ND	ug/L	10	1.2	EPA-6010B	ND		1
Dissolved Selenium	ND	ug/L	100	11	EPA-6010B	ND		1
Dissolved Silicon as Si	**5700**	**ug/L**	**100**	**10**	**EPA-6010B**	ND		1
Dissolved Silver	ND	ug/L	10	1.1	EPA-6010B	ND		1
Dissolved Thallium	ND	ug/L	100	15	EPA-6010B	ND		1
Dissolved Zinc	ND	ug/L	10	5.9	EPA-6010B	ND		1
Total Aluminum	**200**	**ug/L**	**50**	**39**	**EPA-6010B**	ND		4
Total Antimony	ND	ug/L	100	13	EPA-6010B	ND		4
Total Arsenic	ND	ug/L	50	9.8	EPA-6010B	ND		4
Total Barium	**38**	**ug/L**	**10**	**1.0**	**EPA-6010B**	ND		4
Total Beryllium	ND	ug/L	10	1.0	EPA-6010B	ND		4
Total Boron	**58**	**ug/L**	**100**	**10**	**EPA-6010B**	ND	**J**	4
Total Cadmium	ND	ug/L	10	1.0	EPA-6010B	ND		4
Total Chromium	ND	ug/L	10	1.0	EPA-6010B	ND		4
Total Copper	ND	ug/L	10	2.3	EPA-6010B	ND		4
Total Iron	**370**	**ug/L**	**50**	**6.7**	**EPA-6010B**	ND		4
Total Lead	ND	ug/L	50	5.0	EPA-6010B	ND		4
Total Manganese	**190**	**ug/L**	**10**	**1.0**	**EPA-6010B**	ND		4

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Golder Associates
425 Lakeside Drive
Sunnyvale, CA 94085

Reported: 12/12/2011 15:18
Project: Santa Margarita
Project Number: 07397199
Project Manager: Bill Fowler

Water Analysis (Metals)

BCL Sample ID: 1119270-01 | **Client Sample Name:** Santa Margarita, Supply Pond, 11/21/2011 12:45:00PM, Denise Mason

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Total Mercury	ND	ug/L	0.20	0.030	EPA-7470A	ND		5
Total Molybdenum	ND	ug/L	50	5.0	EPA-6010B	ND		4
Total Nickel	**1.2**	**ug/L**	**10**	**1.2**	**EPA-6010B**	ND	**J**	4
Total Selenium	ND	ug/L	100	15	EPA-6010B	ND		4
Total Silver	ND	ug/L	10	1.0	EPA-6010B	ND		4
Total Thallium	ND	ug/L	100	17	EPA-6010B	ND		4
Total Zinc	ND	mg/L	0.050	0.0029	EPA-6010B	0.0042		4

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-6010B	11/21/11	11/23/11 08:48	ARD	PE-OP1	1	BUK1653
2	EPA-7196	11/22/11	11/22/11 09:01	TDC	KONE-1	1	BUK1669
3	EPA-7470A	12/01/11	12/02/11 10:03	MEV	CETAC1	1	BUL0050
4	EPA-6010B	12/01/11	12/02/11 09:53	ARD	PE-OP1	1	BUL0056
5	EPA-7470A	12/02/11	12/06/11 11:38	MEV	CETAC1	1	BUL0131

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425 Lakeside Drive
Sunnyvale, CA 94085

Reported: 12/12/2011 15:18
Project: Santa Margarita
Project Number: 07397199
Project Manager: Bill Fowler

Water Analysis (General Chemistry)

BCL Sample ID: 1119270-02 | **Client Sample Name:** Santa Margarita, Pit Pond, 11/21/2011 12:15:00PM, Denise Mason

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Dissolved Calcium	**200**	**mg/L**	**0.10**	**0.018**	**EPA-6010B**	ND		1
Total Calcium	**200**	**mg/L**	**0.10**	**0.023**	**EPA-6010B**	ND		2
Dissolved Magnesium	**200**	**mg/L**	**0.050**	**0.016**	**EPA-6010B**	ND		1
Total Magnesium	**210**	**mg/L**	**0.050**	**0.016**	**EPA-6010B**	ND		2
Dissolved Sodium	**51**	**mg/L**	**0.50**	**0.050**	**EPA-6010B**	0.20		1
Total Sodium	**57**	**mg/L**	**0.50**	**0.077**	**EPA-6010B**	ND		2
Dissolved Potassium	**17**	**mg/L**	**1.0**	**0.10**	**EPA-6010B**	ND		1
Total Potassium	**18**	**mg/L**	**1.0**	**0.14**	**EPA-6010B**	ND		2
Bicarbonate	**100**	**mg/L**	**10**	**10**	**EPA-310.1**	ND		3
Carbonate	ND	mg/L	5.0	5.0	EPA-310.1	ND		3
Total Alkalinity as CaCO3	**85**	**mg/L**	**8.2**	**8.2**	**EPA-310.1**	ND		3
Chloride	**27**	**mg/L**	**0.50**	**0.066**	**EPA-300.0**	0.19		4
Fluoride	**0.66**	**mg/L**	**0.10**	**0.024**	**EPA-300.0**	ND	**A01**	5
Sulfate	**1300**	**mg/L**	**5.0**	**0.60**	**EPA-300.0**	ND	**A01**	6
Dissolved Hardness as CaCO3	**1300**	**mg/L**	**0.50**	**0.10**	**Calc**	ND		7
Hardness as CaCO3	**1300**	**mg/L**	**0.50**	**0.10**	**Calc**	ND		7
pH	**7.87**	**pH Units**	**0.05**	**0.05**	**EPA-150.1**		**S05**	8
Electrical Conductivity @ 25 C	**2120**	**umhos/cm**	**1.00**	**1.00**	**EPA-120.1**			9
Total Dissolved Solids @ 180 C	**1300**	**mg/L**	**100**	**100**	**EPA-160.1**	ND		10
Total Suspended Solids (Glass Fiber)	**4.0**	**mg/L**	**1.1**	**1.1**	**EPA-160.2**	ND		11
Turbidity	**3.0**	**NT Units**	**0.10**	**0.10**	**EPA-180.1**			12
Total Phosphorus	ND	mg/L	0.050	0.016	EPA-365.4	ND		13
Total Sulfide	ND	mg/L	0.10	0.050	EPA-376.2	ND		14

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Golder Associates
425 Lakeside Drive
Sunnyvale, CA 94085

Reported: 12/12/2011 15:18
Project: Santa Margarita
Project Number: 07397199
Project Manager: Bill Fowler

Water Analysis (General Chemistry)

BCL Sample ID: 1119270-02 | **Client Sample Name:** Santa Margarita, Pit Pond, 11/21/2011 12:15:00PM, Denise Mason

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-6010B	11/21/11	11/23/11 08:50	ARD	PE-OP1	1	BUK1653
2	EPA-6010B	12/01/11	12/02/11 08:35	ARD	PE-OP1	1	BUL0056
3	EPA-310.1	12/05/11	12/05/11 16:08	RML	MET-1	2	BUL0223
4	EPA-300.0	11/23/11	11/23/11 22:37	AKB	IC2	1	BUK1723
5	EPA-300.0	11/23/11	11/23/11 15:35	AKB	IC2	2	BUK1723
6	EPA-300.0	11/23/11	11/23/11 23:45	AKB	IC2	5	BUK1723
7	Calc	11/23/11	12/07/11 17:07	TMS	Calc	1	BUK1752
8	EPA-150.1	12/05/11	12/05/11 16:08	RML	MET-1	1	BUL0223
9	EPA-120.1	12/05/11	12/05/11 16:08	RML	MET-1	1	BUL0223
10	EPA-160.1	11/23/11	11/23/11 10:00	JES	MANUAL	10	BUK1779
11	EPA-160.2	11/23/11	11/23/11 12:45	CAD	MANUAL	2.247	BUK2004
12	EPA-180.1	11/23/11	11/23/11 12:00	CAM	MANUAL	1	BUL0397
13	EPA-365.4	12/01/11	12/05/11 16:15	SDU	SC-1	1	BUL0041
14	EPA-376.2	11/23/11	11/23/11 13:30	DIW	SPEC05	1	BUK2112

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Golder Associates
425 Lakeside Drive
Sunnyvale, CA 94085

Reported: 12/12/2011 15:18
Project: Santa Margarita
Project Number: 07397199
Project Manager: Bill Fowler

Water Analysis (Metals)

BCL Sample ID: 1119270-02 | **Client Sample Name:** Santa Margarita, Pit Pond, 11/21/2011 12:15:00PM, Denise Mason

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Dissolved Aluminum	ND	ug/L	50	26	EPA-6010B	ND		1
Dissolved Antimony	ND	ug/L	100	10	EPA-6010B	ND		1
Dissolved Arsenic	ND	ug/L	50	7.5	EPA-6010B	ND		1
Hexavalent Chromium	ND	ug/L	2.0	0.70	EPA-7196	ND	Z1	2
Dissolved Barium	**33**	**ug/L**	**10**	**1.2**	**EPA-6010B**	ND		1
Dissolved Beryllium	ND	ug/L	10	1.0	EPA-6010B	ND		1
Dissolved Boron	**17**	**ug/L**	**100**	**10**	**EPA-6010B**	ND	**J**	1
Dissolved Cadmium	ND	ug/L	10	1.0	EPA-6010B	ND		1
Dissolved Chromium	**1.0**	**ug/L**	**10**	**1.0**	**EPA-6010B**	ND	**J**	1
Dissolved Copper	ND	ug/L	10	2.3	EPA-6010B	ND		1
Dissolved Iron	ND	ug/L	50	5.0	EPA-6010B	ND		1
Dissolved Lead	**7.6**	**ug/L**	**50**	**5.0**	**EPA-6010B**	ND	**J**	1
Dissolved Manganese	**8.5**	**ug/L**	**10**	**1.0**	**EPA-6010B**	ND	**J**	1
Dissolved Mercury	ND	ug/L	0.20	0.030	EPA-7470A	ND		3
Dissolved Molybdenum	**23**	**ug/L**	**50**	**5.0**	**EPA-6010B**	ND	**J**	1
Dissolved Nickel	ND	ug/L	10	1.2	EPA-6010B	ND		1
Dissolved Selenium	ND	ug/L	100	11	EPA-6010B	ND		1
Dissolved Silicon as Si	**2200**	**ug/L**	**100**	**10**	**EPA-6010B**	ND		1
Dissolved Silver	ND	ug/L	10	1.1	EPA-6010B	ND		1
Dissolved Thallium	ND	ug/L	100	15	EPA-6010B	ND		1
Dissolved Zinc	ND	ug/L	10	5.9	EPA-6010B	ND		1
Total Aluminum	**110**	**ug/L**	**50**	**39**	**EPA-6010B**	ND		4
Total Antimony	ND	ug/L	100	13	EPA-6010B	ND		4
Total Arsenic	ND	ug/L	50	9.8	EPA-6010B	ND		4
Total Barium	**36**	**ug/L**	**10**	**1.0**	**EPA-6010B**	ND		4
Total Beryllium	ND	ug/L	10	1.0	EPA-6010B	ND		4
Total Boron	**22**	**ug/L**	**100**	**10**	**EPA-6010B**	ND	**J**	4
Total Cadmium	ND	ug/L	10	1.0	EPA-6010B	ND		4
Total Chromium	ND	ug/L	10	1.0	EPA-6010B	ND		4
Total Copper	ND	ug/L	10	2.3	EPA-6010B	ND		4
Total Iron	**210**	**ug/L**	**50**	**6.7**	**EPA-6010B**	ND		4
Total Lead	**6.0**	**ug/L**	**50**	**5.0**	**EPA-6010B**	ND	**J**	4
Total Manganese	**16**	**ug/L**	**10**	**1.0**	**EPA-6010B**	ND		4

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Golder Associates
425 Lakeside Drive
Sunnyvale, CA 94085

Reported: 12/12/2011 15:18
Project: Santa Margarita
Project Number: 07397199
Project Manager: Bill Fowler

Water Analysis (Metals)

BCL Sample ID: 1119270-02 | **Client Sample Name:** Santa Margarita, Pit Pond, 11/21/2011 12:15:00PM, Denise Mason

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Total Mercury	ND	ug/L	0.20	0.030	EPA-7470A	ND		5
Total Molybdenum	**25**	**ug/L**	**50**	**5.0**	**EPA-6010B**	ND	**J**	4
Total Nickel	ND	ug/L	10	1.2	EPA-6010B	ND		4
Total Selenium	ND	ug/L	100	15	EPA-6010B	ND		4
Total Silver	ND	ug/L	10	1.0	EPA-6010B	ND		4
Total Thallium	ND	ug/L	100	17	EPA-6010B	ND		4
Total Zinc	**0.0077**	**mg/L**	**0.050**	**0.0029**	**EPA-6010B**	0.0042	**J**	4

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-6010B	11/21/11	11/23/11 08:50	ARD	PE-OP1	1	BUK1653
2	EPA-7196	11/22/11	11/22/11 09:01	TDC	KONE-1	1	BUK1669
3	EPA-7470A	12/01/11	12/02/11 10:05	MEV	CETAC1	1	BUL0050
4	EPA-6010B	12/01/11	12/02/11 08:35	ARD	PE-OP1	1	BUL0056
5	EPA-7470A	12/02/11	12/06/11 11:40	MEV	CETAC1	1	BUL0131

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Golder Associates
425 Lakeside Drive
Sunnyvale, CA 94085

Reported: 12/12/2011 15:18
Project: Santa Margarita
Project Number: 07397199
Project Manager: Bill Fowler

Water Analysis (General Chemistry)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: BUK1653						
Dissolved Calcium	BUK1653-BLK1	ND	mg/L	0.10	0.018	
Dissolved Magnesium	BUK1653-BLK1	ND	mg/L	0.050	0.016	
Dissolved Sodium	BUK1653-BLK1	0.20128	mg/L	0.50	0.050	J
Dissolved Potassium	BUK1653-BLK1	ND	mg/L	1.0	0.10	
QC Batch ID: BUK1723						
Chloride	BUK1723-BLK1	0.18600	mg/L	0.50	0.066	J
Fluoride	BUK1723-BLK1	ND	mg/L	0.050	0.012	
Sulfate	BUK1723-BLK1	ND	mg/L	1.0	0.12	
QC Batch ID: BUK1752						
Dissolved Hardness as CaCO3	BUK1752-BLK1	ND	mg/L	0.50	0.10	
QC Batch ID: BUK1779						
Total Dissolved Solids @ 180 C	BUK1779-BLK1	ND	mg/L	6.7	6.7	
QC Batch ID: BUK2004						
Total Suspended Solids (Glass Fiber)	BUK2004-BLK1	ND	mg/L	0.50	0.50	
QC Batch ID: BUK2112						
Total Sulfide	BUK2112-BLK1	ND	mg/L	0.10	0.050	
QC Batch ID: BUL0041						
Total Phosphorus	BUL0041-BLK1	ND	mg/L	0.050	0.016	
QC Batch ID: BUL0056						
Total Calcium	BUL0056-BLK1	ND	mg/L	0.10	0.023	
Total Magnesium	BUL0056-BLK1	ND	mg/L	0.050	0.016	
Total Sodium	BUL0056-BLK1	ND	mg/L	0.50	0.077	
Total Potassium	BUL0056-BLK1	ND	mg/L	1.0	0.14	
QC Batch ID: BUL0223						
Bicarbonate	BUL0223-BLK1	ND	mg/L	5.0	5.0	
Carbonate	BUL0223-BLK1	ND	mg/L	2.5	2.5	
Total Alkalinity as CaCO3	BUL0223-BLK1	ND	mg/L	4.1	4.1	

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Golder Associates
425 Lakeside Drive
Sunnyvale, CA 94085

Reported: 12/12/2011 15:18
Project: Santa Margarita
Project Number: 07397199
Project Manager: Bill Fowler

Water Analysis (General Chemistry)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits Percent Recovery	Control Limits RPD	Lab Quals
QC Batch ID: BUK1653										
Dissolved Calcium	BUK1653-BS1	LCS	10.095	10.000	mg/L	101		85 - 115		
Dissolved Magnesium	BUK1653-BS1	LCS	10.051	10.000	mg/L	101		85 - 115		
Dissolved Sodium	BUK1653-BS1	LCS	10.494	10.000	mg/L	105		85 - 115		
Dissolved Potassium	BUK1653-BS1	LCS	9.7715	10.000	mg/L	97.7		85 - 115		
QC Batch ID: BUK1723										
Chloride	BUK1723-BS1	LCS	48.918	50.000	mg/L	97.8		90 - 110		
Fluoride	BUK1723-BS1	LCS	0.97100	1.0000	mg/L	97.1		90 - 110		
Sulfate	BUK1723-BS1	LCS	98.626	100.00	mg/L	98.6		90 - 110		
QC Batch ID: BUK1779										
Total Dissolved Solids @ 180 C	BUK1779-BS1	LCS	605.00	586.00	mg/L	103		90 - 110		
QC Batch ID: BUK2112										
Total Sulfide	BUK2112-BS1	LCS	0.48179	0.50000	mg/L	96.4		90 - 110		
QC Batch ID: BUL0041										
Total Phosphorus	BUL0041-BS1	LCS	1.0541	1.0000	mg/L	105		85 - 115		
QC Batch ID: BUL0056										
Total Calcium	BUL0056-BS1	LCS	10.365	10.000	mg/L	104		85 - 115		
Total Magnesium	BUL0056-BS1	LCS	10.707	10.000	mg/L	107		85 - 115		
Total Sodium	BUL0056-BS1	LCS	9.8410	10.000	mg/L	98.4		85 - 115		
Total Potassium	BUL0056-BS1	LCS	9.5966	10.000	mg/L	96.0		85 - 115		
QC Batch ID: BUL0223										
Total Alkalinity as CaCO3	BUL0223-BS3	LCS	100.26	100.00	mg/L	100		90 - 110		
pH	BUL0223-BS2	LCS	7.0100	7.0000	pH Units	100		95 - 105		
Electrical Conductivity @ 25 C	BUL0223-BS1	LCS	308.40	303.00	umhos/cm	102		90 - 110		

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425 Lakeside Drive
Sunnyvale, CA 94085

Reported: 12/12/2011 15:18
Project: Santa Margarita
Project Number: 07397199
Project Manager: Bill Fowler

Water Analysis (General Chemistry)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: BUK1653	Used client sample: N										
Dissolved Calcium	DUP	1119265-01	81.435	81.548		mg/L	0.1		20		
	MS	1119265-01	81.435	92.296	10.204	mg/L		106		75 - 125	
	MSD	1119265-01	81.435	92.012	10.204	mg/L	0.3	104	20	75 - 125	
Dissolved Magnesium	DUP	1119265-01	21.031	21.107		mg/L	0.4		20		
	MS	1119265-01	21.031	31.654	10.204	mg/L		104		75 - 125	
	MSD	1119265-01	21.031	31.903	10.204	mg/L	0.8	107	20	75 - 125	
Dissolved Sodium	DUP	1119265-01	98.338	98.478		mg/L	0.1		20		
	MS	1119265-01	98.338	108.24	10.204	mg/L		97.1		75 - 125	
	MSD	1119265-01	98.338	107.80	10.204	mg/L	0.4	92.8	20	75 - 125	
Dissolved Potassium	DUP	1119265-01	3.1648	3.1757		mg/L	0.3		20		
	MS	1119265-01	3.1648	13.600	10.204	mg/L		102		75 - 125	
	MSD	1119265-01	3.1648	13.539	10.204	mg/L	0.5	102	20	75 - 125	
QC Batch ID: BUK1723	Used client sample: N										
Chloride	DUP	1119227-12	143.07	143.30		mg/L	0.2		10		
	MS	1119227-12	143.07	190.52	50.505	mg/L		94.0		80 - 120	
	MSD	1119227-12	143.07	190.48	50.505	mg/L	0.0	93.9	10	80 - 120	
Fluoride	DUP	1119227-12	0.26700	0.27900		mg/L	4.4		10		
	MS	1119227-12	0.26700	1.3374	1.0101	mg/L		106		80 - 120	
	MSD	1119227-12	0.26700	1.3020	1.0101	mg/L	2.7	102	10	80 - 120	
Sulfate	DUP	1119227-12	10.054	10.106		mg/L	0.5		10		
	MS	1119227-12	10.054	114.94	101.01	mg/L		104		80 - 120	
	MSD	1119227-12	10.054	114.95	101.01	mg/L	0.0	104	10	80 - 120	
QC Batch ID: BUK1779	Used client sample: N										
Total Dissolved Solids @ 180 C	DUP	1119189-06	6000.0	5960.0		mg/L	0.7		10		
QC Batch ID: BUK2004	Used client sample: N										
Total Suspended Solids (Glass Fiber)	DUP	1119354-02	65.000	48.000		mg/L	30.1		10		Q01
QC Batch ID: BUK2112	Used client sample: Y - Description: Supply Pond, 11/21/2011 12:45										
Total Sulfide	DUP	1119270-01	ND	ND		mg/L			10		
	MS	1119270-01	ND	0.49064	0.50000	mg/L		98.1		80 - 120	
	MSD	1119270-01	ND	0.49655	0.50000	mg/L	1.2	99.3	10	80 - 120	
QC Batch ID: BUL0041	Used client sample: N										
Total Phosphorus	DUP	1119278-01	ND	ND		mg/L			20		
	MS	1119278-01	ND	1.0654	1.0000	mg/L		107		80 - 120	
	MSD	1119278-01	ND	1.0688	1.0000	mg/L	0.3	107	20	80 - 120	
QC Batch ID: BUL0056	Used client sample: Y - Description: Supply Pond, 11/21/2011 12:45										

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Golder Associates
425 Lakeside Drive
Sunnyvale, CA 94085

Reported: 12/12/2011 15:18
Project: Santa Margarita
Project Number: 07397199
Project Manager: Bill Fowler

Water Analysis (General Chemistry)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: BUL0056	Used client sample: Y - Description: Supply Pond, 11/21/2011 12:45										
Total Calcium	DUP	1119270-01	50.232	49.824		mg/L	0.8		20		
	MS	1119270-01	50.232	58.981	10.000	mg/L		87.5		75 - 125	
	MSD	1119270-01	50.232	58.766	10.000	mg/L	0.4	85.3	20	75 - 125	
Total Magnesium	DUP	1119270-01	28.563	28.269		mg/L	1.0		20		
	MS	1119270-01	28.563	37.817	10.000	mg/L		92.5		75 - 125	
	MSD	1119270-01	28.563	38.050	10.000	mg/L	0.6	94.9	20	75 - 125	
Total Sodium	DUP	1119270-01	24.156	24.273		mg/L	0.5		20		
	MS	1119270-01	24.156	32.941	10.000	mg/L		87.9		75 - 125	
	MSD	1119270-01	24.156	32.186	10.000	mg/L	2.3	80.3	20	75 - 125	
Total Potassium	DUP	1119270-01	3.3469	3.2625		mg/L	2.6		20		
	MS	1119270-01	3.3469	12.997	10.000	mg/L		96.5		75 - 125	
	MSD	1119270-01	3.3469	12.735	10.000	mg/L	2.0	93.9	20	75 - 125	
QC Batch ID: BUL0223	Used client sample: N										
Bicarbonate	DUP	1119267-10	193.66	193.66		mg/L	0		10		
Carbonate	DUP	1119267-10	ND	ND		mg/L			10		
Total Alkalinity as CaCO3	DUP	1119267-10	158.83	158.83		mg/L	0		10		
pH	DUP	1119267-10	7.3400	7.3400		pH Units	0		20		
Electrical Conductivity @ 25 C	DUP	1119267-10	446.50	446.80		umhos/cm	0.1		10		
QC Batch ID: BUL0397	Used client sample: Y - Description: Supply Pond, 11/21/2011 12:45										
Turbidity	DUP	1119270-01	3.5200	3.5300		NT Units	0.3		10		

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Golder Associates
425 Lakeside Drive
Sunnyvale, CA 94085

Reported: 12/12/2011 15:18
Project: Santa Margarita
Project Number: 07397199
Project Manager: Bill Fowler

Water Analysis (Metals)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: BUK1653						
Dissolved Aluminum	BUK1653-BLK1	ND	ug/L	50	26	
Dissolved Antimony	BUK1653-BLK1	ND	ug/L	100	10	
Dissolved Arsenic	BUK1653-BLK1	ND	ug/L	50	7.5	
Dissolved Barium	BUK1653-BLK1	ND	ug/L	10	1.2	
Dissolved Beryllium	BUK1653-BLK1	ND	ug/L	10	1.0	
Dissolved Boron	BUK1653-BLK1	ND	ug/L	100	10	
Dissolved Cadmium	BUK1653-BLK1	ND	ug/L	10	1.0	
Dissolved Chromium	BUK1653-BLK1	ND	ug/L	10	1.0	
Dissolved Copper	BUK1653-BLK1	ND	ug/L	10	2.3	
Dissolved Iron	BUK1653-BLK1	ND	ug/L	50	5.0	
Dissolved Lead	BUK1653-BLK1	ND	ug/L	50	5.0	
Dissolved Manganese	BUK1653-BLK1	ND	ug/L	10	1.0	
Dissolved Molybdenum	BUK1653-BLK1	ND	ug/L	50	5.0	
Dissolved Nickel	BUK1653-BLK1	ND	ug/L	10	1.2	
Dissolved Selenium	BUK1653-BLK1	ND	ug/L	100	11	
Dissolved Silicon as Si	BUK1653-BLK1	ND	ug/L	100	10	
Dissolved Silver	BUK1653-BLK1	ND	ug/L	10	1.1	
Dissolved Thallium	BUK1653-BLK1	ND	ug/L	100	15	
Dissolved Zinc	BUK1653-BLK1	ND	ug/L	10	5.9	
QC Batch ID: BUK1669						
Hexavalent Chromium	BUK1669-BLK1	ND	ug/L	2.0	0.70	
QC Batch ID: BUL0050						
Dissolved Mercury	BUL0050-BLK1	ND	ug/L	0.20	0.030	
QC Batch ID: BUL0056						
Total Aluminum	BUL0056-BLK1	ND	ug/L	50	39	
Total Antimony	BUL0056-BLK1	ND	ug/L	100	13	
Total Arsenic	BUL0056-BLK1	ND	ug/L	50	9.8	
Total Barium	BUL0056-BLK1	ND	ug/L	10	1.0	
Total Beryllium	BUL0056-BLK1	ND	ug/L	10	1.0	
Total Boron	BUL0056-BLK1	ND	ug/L	100	10	
Total Cadmium	BUL0056-BLK1	ND	ug/L	10	1.0	
Total Chromium	BUL0056-BLK1	ND	ug/L	10	1.0	
Total Copper	BUL0056-BLK1	ND	ug/L	10	2.3	

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Golder Associates
425 Lakeside Drive
Sunnyvale, CA 94085

Reported: 12/12/2011 15:18
Project: Santa Margarita
Project Number: 07397199
Project Manager: Bill Fowler

Water Analysis (Metals)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: BUL0056						
Total Iron	BUL0056-BLK1	ND	ug/L	50	6.7	
Total Lead	BUL0056-BLK1	ND	ug/L	50	5.0	
Total Manganese	BUL0056-BLK1	ND	ug/L	10	1.0	
Total Molybdenum	BUL0056-BLK1	ND	ug/L	50	5.0	
Total Nickel	BUL0056-BLK1	ND	ug/L	10	1.2	
Total Selenium	BUL0056-BLK1	ND	ug/L	100	15	
Total Silver	BUL0056-BLK1	ND	ug/L	10	1.0	
Total Thallium	BUL0056-BLK1	ND	ug/L	100	17	
Total Zinc	BUL0056-BLK1	0.0041752	mg/L	0.050	0.0029	J
QC Batch ID: BUL0131						
Total Mercury	BUL0131-BLK1	ND	ug/L	0.20	0.030	

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Sunnyvale, CA 94085

Reported: 12/12/2011 15:18
Project: Santa Margarita
Project Number: 07397199
Project Manager: Bill Fowler

Water Analysis (Metals)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits Percent Recovery	Control Limits RPD	Lab Quals
QC Batch ID: BUK1653										
Dissolved Aluminum	BUK1653-BS1	LCS	1007.2	1000.0	ug/L	101		85 - 115		
Dissolved Antimony	BUK1653-BS1	LCS	381.96	400.00	ug/L	95.5		85 - 115		
Dissolved Arsenic	BUK1653-BS1	LCS	186.14	200.00	ug/L	93.1		85 - 115		
Dissolved Barium	BUK1653-BS1	LCS	397.15	400.00	ug/L	99.3		85 - 115		
Dissolved Beryllium	BUK1653-BS1	LCS	194.61	200.00	ug/L	97.3		85 - 115		
Dissolved Boron	BUK1653-BS1	LCS	955.34	1000.0	ug/L	95.5		85 - 115		
Dissolved Cadmium	BUK1653-BS1	LCS	194.52	200.00	ug/L	97.3		85 - 115		
Dissolved Chromium	BUK1653-BS1	LCS	199.79	200.00	ug/L	99.9		85 - 115		
Dissolved Copper	BUK1653-BS1	LCS	385.09	400.00	ug/L	96.3		85 - 115		
Dissolved Iron	BUK1653-BS1	LCS	1010.3	1000.0	ug/L	101		85 - 115		
Dissolved Lead	BUK1653-BS1	LCS	408.62	400.00	ug/L	102		85 - 115		
Dissolved Manganese	BUK1653-BS1	LCS	478.28	500.00	ug/L	95.7		85 - 115		
Dissolved Molybdenum	BUK1653-BS1	LCS	198.02	200.00	ug/L	99.0		85 - 115		
Dissolved Nickel	BUK1653-BS1	LCS	410.13	400.00	ug/L	103		85 - 115		
Dissolved Selenium	BUK1653-BS1	LCS	207.22	200.00	ug/L	104		85 - 115		
Dissolved Silicon as Si	BUK1653-BS1	LCS	9215.1	10000	ug/L	92.2		85 - 115		
Dissolved Silver	BUK1653-BS1	LCS	94.865	100.00	ug/L	94.9		85 - 115		
Dissolved Thallium	BUK1653-BS1	LCS	422.69	400.00	ug/L	106		85 - 115		
Dissolved Zinc	BUK1653-BS1	LCS	509.56	500.00	ug/L	102		85 - 115		
QC Batch ID: BUK1669										
Hexavalent Chromium	BUK1669-BS1	LCS	ND	50.000	ug/L	-1.6		85 - 115		L01
QC Batch ID: BUL0050										
Dissolved Mercury	BUL0050-BS1	LCS	1.0225	1.0000	ug/L	102		85 - 115		
QC Batch ID: BUL0056										
Total Aluminum	BUL0056-BS1	LCS	1073.5	1000.0	ug/L	107		85 - 115		
Total Antimony	BUL0056-BS1	LCS	388.68	400.00	ug/L	97.2		85 - 115		
Total Arsenic	BUL0056-BS1	LCS	189.99	200.00	ug/L	95.0		85 - 115		
Total Barium	BUL0056-BS1	LCS	418.06	400.00	ug/L	105		85 - 115		
Total Beryllium	BUL0056-BS1	LCS	198.42	200.00	ug/L	99.2		85 - 115		
Total Boron	BUL0056-BS1	LCS	969.63	1000.0	ug/L	97.0		85 - 115		
Total Cadmium	BUL0056-BS1	LCS	199.29	200.00	ug/L	99.6		85 - 115		
Total Chromium	BUL0056-BS1	LCS	203.25	200.00	ug/L	102		85 - 115		
Total Copper	BUL0056-BS1	LCS	391.51	400.00	ug/L	97.9		85 - 115		

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Golder Associates
425 Lakeside Drive
Sunnyvale, CA 94085

Reported: 12/12/2011 15:18
Project: Santa Margarita
Project Number: 07397199
Project Manager: Bill Fowler

Water Analysis (Metals)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits Percent Recovery	Control Limits RPD	Lab Quals
QC Batch ID: BUL0056										
Total Iron	BUL0056-BS1	LCS	1045.3	1000.0	ug/L	105		85 - 115		
Total Lead	BUL0056-BS1	LCS	412.86	400.00	ug/L	103		85 - 115		
Total Manganese	BUL0056-BS1	LCS	478.70	500.00	ug/L	95.7		85 - 115		
Total Molybdenum	BUL0056-BS1	LCS	204.17	200.00	ug/L	102		85 - 115		
Total Nickel	BUL0056-BS1	LCS	417.78	400.00	ug/L	104		85 - 115		
Total Selenium	BUL0056-BS1	LCS	213.56	200.00	ug/L	107		85 - 115		
Total Silver	BUL0056-BS1	LCS	93.318	100.00	ug/L	93.3		85 - 115		
Total Thallium	BUL0056-BS1	LCS	434.99	400.00	ug/L	109		85 - 115		
Total Zinc	BUL0056-BS1	LCS	0.53219	0.50000	mg/L	106		85 - 115		
QC Batch ID: BUL0131										
Total Mercury	BUL0131-BS1	LCS	1.0200	1.0000	ug/L	102		85 - 115		

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425 Lakeside Drive
Sunnyvale, CA 94085

Reported: 12/12/2011 15:18
Project: Santa Margarita
Project Number: 07397199
Project Manager: Bill Fowler

Water Analysis (Metals)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: BUK1653	Used client sample: N										
Dissolved Aluminum	DUP	1119265-01	ND	ND		ug/L			20		
	MS	1119265-01	ND	1031.3	1020.4	ug/L		101		75 - 125	
	MSD	1119265-01	ND	1064.2	1020.4	ug/L	3.1	104	20	75 - 125	
Dissolved Antimony	DUP	1119265-01	ND	ND		ug/L			20		
	MS	1119265-01	ND	411.15	408.16	ug/L		101		75 - 125	
	MSD	1119265-01	ND	411.53	408.16	ug/L	0.1	101	20	75 - 125	
Dissolved Arsenic	DUP	1119265-01	ND	ND		ug/L			20		
	MS	1119265-01	ND	208.99	204.08	ug/L		102		75 - 125	
	MSD	1119265-01	ND	204.21	204.08	ug/L	2.3	100	20	75 - 125	
Dissolved Barium	DUP	1119265-01	101.23	102.25		ug/L	1.0		20		
	MS	1119265-01	101.23	515.07	408.16	ug/L		101		75 - 125	
	MSD	1119265-01	101.23	514.71	408.16	ug/L	0.1	101	20	75 - 125	
Dissolved Beryllium	DUP	1119265-01	ND	ND		ug/L			20		
	MS	1119265-01	ND	211.34	204.08	ug/L		104		75 - 125	
	MSD	1119265-01	ND	211.43	204.08	ug/L	0.0	104	20	75 - 125	
Dissolved Boron	DUP	1119265-01	264.70	257.20		ug/L	2.9		20		
	MS	1119265-01	264.70	1326.4	1020.4	ug/L		104		75 - 125	
	MSD	1119265-01	264.70	1321.4	1020.4	ug/L	0.4	104	20	75 - 125	
Dissolved Cadmium	DUP	1119265-01	ND	ND		ug/L			20		
	MS	1119265-01	ND	208.62	204.08	ug/L		102		75 - 125	
	MSD	1119265-01	ND	207.00	204.08	ug/L	0.8	101	20	75 - 125	
Dissolved Chromium	DUP	1119265-01	3.6460	3.9116		ug/L	7.0		20		J
	MS	1119265-01	3.6460	210.56	204.08	ug/L		101		75 - 125	
	MSD	1119265-01	3.6460	210.86	204.08	ug/L	0.1	102	20	75 - 125	
Dissolved Copper	DUP	1119265-01	ND	ND		ug/L			20		
	MS	1119265-01	ND	410.19	408.16	ug/L		100		75 - 125	
	MSD	1119265-01	ND	412.83	408.16	ug/L	0.6	101	20	75 - 125	
Dissolved Iron	DUP	1119265-01	ND	ND		ug/L			20		
	MS	1119265-01	ND	1069.1	1020.4	ug/L		105		75 - 125	
	MSD	1119265-01	ND	1073.6	1020.4	ug/L	0.4	105	20	75 - 125	
Dissolved Lead	DUP	1119265-01	ND	5.7718		ug/L			20		J
	MS	1119265-01	ND	424.19	408.16	ug/L		104		75 - 125	
	MSD	1119265-01	ND	420.78	408.16	ug/L	0.8	103	20	75 - 125	
Dissolved Manganese	DUP	1119265-01	1.1724	ND		ug/L			20		
	MS	1119265-01	1.1724	512.32	510.20	ug/L		100		75 - 125	
	MSD	1119265-01	1.1724	505.89	510.20	ug/L	1.3	98.9	20	75 - 125	
Dissolved Molybdenum	DUP	1119265-01	ND	ND		ug/L			20		
	MS	1119265-01	ND	211.05	204.08	ug/L		103		75 - 125	
	MSD	1119265-01	ND	210.45	204.08	ug/L	0.3	103	20	75 - 125	

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Golder Associates
425 Lakeside Drive
Sunnyvale, CA 94085

Reported: 12/12/2011 15:18
Project: Santa Margarita
Project Number: 07397199
Project Manager: Bill Fowler

Water Analysis (Metals)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: BUK1653	Used client sample: N										
Dissolved Nickel	DUP	1119265-01	1.4964	ND		ug/L			20		
	MS	1119265-01	1.4964	418.63	408.16	ug/L		102		75 - 125	
	MSD	1119265-01	1.4964	415.31	408.16	ug/L	0.8	101	20	75 - 125	
Dissolved Selenium	DUP	1119265-01	14.313	ND		ug/L			20		
	MS	1119265-01	14.313	270.12	204.08	ug/L		125		75 - 125	
	MSD	1119265-01	14.313	263.61	204.08	ug/L	2.4	122	20	75 - 125	
Dissolved Silicon as Si	DUP	1119265-01	25310	25277		ug/L	0.1		20		
	MS	1119265-01	25310	35003	10204	ug/L		95.0		75 - 125	
	MSD	1119265-01	25310	35064	10204	ug/L	0.2	95.6	20	75 - 125	
Dissolved Silver	DUP	1119265-01	ND	ND		ug/L			20		
	MS	1119265-01	ND	101.16	102.04	ug/L		99.1		75 - 125	
	MSD	1119265-01	ND	99.255	102.04	ug/L	1.9	97.3	20	75 - 125	
Dissolved Thallium	DUP	1119265-01	ND	ND		ug/L			20		
	MS	1119265-01	ND	428.15	408.16	ug/L		105		75 - 125	
	MSD	1119265-01	ND	425.52	408.16	ug/L	0.6	104	20	75 - 125	
Dissolved Zinc	DUP	1119265-01	ND	ND		ug/L			20		
	MS	1119265-01	ND	547.44	510.20	ug/L		107		75 - 125	
	MSD	1119265-01	ND	546.92	510.20	ug/L	0.1	107	20	75 - 125	
QC Batch ID: BUK1669	Used client sample: N										
Hexavalent Chromium	DUP	1119266-01	ND	ND		ug/L			10		
	MS	1119266-01	ND	53.036	52.632	ug/L		101		85 - 115	
	MSD	1119266-01	ND	52.657	52.632	ug/L	0.7	100	10	85 - 115	
QC Batch ID: BUL0050	Used client sample: N										
Dissolved Mercury	DUP	1118181-01	0.045000	ND		ug/L			20		
	MS	1118181-01	0.045000	1.0225	1.0000	ug/L		97.8		70 - 130	
	MSD	1118181-01	0.045000	1.0375	1.0000	ug/L	1.5	99.2	20	70 - 130	
QC Batch ID: BUL0056	Used client sample: Y - Description: Supply Pond, 11/21/2011 12:45										
Total Aluminum	DUP	1119270-01	204.16	185.94		ug/L	9.3		20		
	MS	1119270-01	204.16	1239.0	1000.0	ug/L		103		75 - 125	
	MSD	1119270-01	204.16	1251.8	1000.0	ug/L	1.0	105	20	75 - 125	
Total Antimony	DUP	1119270-01	ND	ND		ug/L			20		
	MS	1119270-01	ND	396.16	400.00	ug/L		99.0		75 - 125	
	MSD	1119270-01	ND	392.09	400.00	ug/L	1.0	98.0	20	75 - 125	
Total Arsenic	DUP	1119270-01	ND	ND		ug/L			20		
	MS	1119270-01	ND	194.98	200.00	ug/L		97.5		75 - 125	
	MSD	1119270-01	ND	187.74	200.00	ug/L	3.8	93.9	20	75 - 125	

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Golder Associates
425 Lakeside Drive
Sunnyvale, CA 94085

Reported: 12/12/2011 15:18
Project: Santa Margarita
Project Number: 07397199
Project Manager: Bill Fowler

Water Analysis (Metals)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: BUL0056	Used client sample: Y - Description: Supply Pond, 11/21/2011 12:45										
Total Barium	DUP	1119270-01	38.433	38.976		ug/L	1.4		20		
	MS	1119270-01	38.433	439.36	400.00	ug/L		100		75 - 125	
	MSD	1119270-01	38.433	438.56	400.00	ug/L	0.2	100	20	75 - 125	
Total Beryllium	DUP	1119270-01	ND	ND		ug/L			20		
	MS	1119270-01	ND	200.00	200.00	ug/L		100		75 - 125	
	MSD	1119270-01	ND	196.63	200.00	ug/L	1.7	98.3	20	75 - 125	
Total Boron	DUP	1119270-01	58.261	57.083		ug/L	2.0		20		J
	MS	1119270-01	58.261	1018.7	1000.0	ug/L		96.0		75 - 125	
	MSD	1119270-01	58.261	994.57	1000.0	ug/L	2.4	93.6	20	75 - 125	
Total Cadmium	DUP	1119270-01	ND	ND		ug/L			20		
	MS	1119270-01	ND	196.06	200.00	ug/L		98.0		75 - 125	
	MSD	1119270-01	ND	193.28	200.00	ug/L	1.4	96.6	20	75 - 125	
Total Chromium	DUP	1119270-01	ND	ND		ug/L			20		
	MS	1119270-01	ND	200.01	200.00	ug/L		100		75 - 125	
	MSD	1119270-01	ND	195.40	200.00	ug/L	2.3	97.7	20	75 - 125	
Total Copper	DUP	1119270-01	ND	ND		ug/L			20		
	MS	1119270-01	ND	393.81	400.00	ug/L		98.5		75 - 125	
	MSD	1119270-01	ND	387.47	400.00	ug/L	1.6	96.9	20	75 - 125	
Total Iron	DUP	1119270-01	372.19	376.62		ug/L	1.2		20		
	MS	1119270-01	372.19	1406.9	1000.0	ug/L		103		75 - 125	
	MSD	1119270-01	372.19	1393.7	1000.0	ug/L	0.9	102	20	75 - 125	
Total Lead	DUP	1119270-01	ND	ND		ug/L			20		
	MS	1119270-01	ND	402.08	400.00	ug/L		101		75 - 125	
	MSD	1119270-01	ND	397.22	400.00	ug/L	1.2	99.3	20	75 - 125	
Total Manganese	DUP	1119270-01	193.18	190.87		ug/L	1.2		20		
	MS	1119270-01	193.18	675.14	500.00	ug/L		96.4		75 - 125	
	MSD	1119270-01	193.18	661.57	500.00	ug/L	2.0	93.7	20	75 - 125	
Total Molybdenum	DUP	1119270-01	ND	ND		ug/L			20		
	MS	1119270-01	ND	203.54	200.00	ug/L		102		75 - 125	
	MSD	1119270-01	ND	199.35	200.00	ug/L	2.1	99.7	20	75 - 125	
Total Nickel	DUP	1119270-01	ND	1.3522		ug/L			20		J
	MS	1119270-01	ND	402.63	400.00	ug/L		101		75 - 125	
	MSD	1119270-01	ND	394.14	400.00	ug/L	2.1	98.5	20	75 - 125	
Total Selenium	DUP	1119270-01	ND	ND		ug/L			20		
	MS	1119270-01	ND	211.27	200.00	ug/L		106		75 - 125	
	MSD	1119270-01	ND	211.53	200.00	ug/L	0.1	106	20	75 - 125	
Total Silver	DUP	1119270-01	ND	ND		ug/L			20		
	MS	1119270-01	ND	96.357	100.00	ug/L		96.4		75 - 125	
	MSD	1119270-01	ND	93.723	100.00	ug/L	2.8	93.7	20	75 - 125	

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Golder Associates
425 Lakeside Drive
Sunnyvale, CA 94085

Reported: 12/12/2011 15:18
Project: Santa Margarita
Project Number: 07397199
Project Manager: Bill Fowler

Water Analysis (Metals)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: BUL0056	Used client sample: Y - Description: Supply Pond, 11/21/2011 12:45										
Total Thallium	DUP	1119270-01	ND	ND		ug/L			20		
	MS	1119270-01	ND	419.06	400.00	ug/L		105		75 - 125	
	MSD	1119270-01	ND	410.82	400.00	ug/L	2.0	103	20	75 - 125	
Total Zinc	DUP	1119270-01	ND	ND		mg/L			20		
	MS	1119270-01	ND	0.50640	0.50000	mg/L		101		75 - 125	
	MSD	1119270-01	ND	0.50324	0.50000	mg/L	0.6	101	20	75 - 125	
QC Batch ID: BUL0131	Used client sample: N										
Total Mercury	DUP	1119347-01	ND	ND		ug/L			20		
	MS	1119347-01	ND	1.0625	1.0000	ug/L		106		70 - 130	
	MSD	1119347-01	ND	1.0325	1.0000	ug/L	2.9	103	20	70 - 130	

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Golder Associates 425 Lakeside Drive Sunnyvale, CA 94085	**Reported:** 12/12/2011 15:18 Project: Santa Margarita Project Number: 07397199 Project Manager: Bill Fowler

Notes And Definitions

J	Estimated Value (CLP Flag)
MDL	Method Detection Limit
ND	Analyte Not Detected at or above the reporting limit
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
A01	PQL's and MDL's are raised due to sample dilution.
L01	The Laboratory Control Sample Water (LCSW) recovery is not within laboratory established control limits.
Q01	Sample precision is not within the control limits.
S05	The sample holding time was exceeded.
Z1	This sample was re-analyzed past holding time with a valid BS for confirmation.

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