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Date: February 15, 2017

To: Ms. Lisa Scoralle, P.G.

Lahontan Regional Water Quality Control Board

2501 Lake Tahoe Blvd, South Lake Tahoe, CA 96150

From: Ryan Smith P.G., C.Hg, CG Roxane

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Subject: Response to Phase 3 Report Comments

The Lahontan Regional Water Quality Control Board (Water Board) issued a letter dated December 30, 2016, "Comments Regarding Phase 3 Site Groundwater Investigation Report" for the Crystal Geyser Roxane Olancha Water Bottling Facility (site), in Olancha, California. Geosyntec Consultants

(Geosyntec) are providing the technical revisions to the Phase 3 Site Groundwater Investigation Report, which will be submitted to the Water Board on or before March 1, 2017.

The following provides a narrative of Crystal Geyser Roxane's (CGR) response to comments provided in the letter. Not all of the comments are directly addressed in this letter as some of the comments do not require a response or will be addressed by Geosyntec in the revisions to the Phase 3 Site Groundwater Investigation Report. Specifically, this letter addresses comments 2, 6, 8, 12, 15, 16, and 17, and Geosyntec will address comments 1, 3, 4, and 14, in the Revised Phase 3 Site Groundwater Investigation Report. The remaining comments 5, 7, 9, 10, 11, and 13 did not require a response. In the following letter, CGR has provided additional explanation and clarification of our conclusions based on data collected during site investigations in order to address key comments. The format of this letter provides a restatement of the comment followed by our response.

Comment #2 Page 2:

> *The Phase 3 Report (page12, middle of first paragraph) concludes that naturally occurring Arsenic concentrations in groundwater increase eastward of the Spring-line fault as a result of the increasing presence of the lacustrine sediments toward Owens Dry Lake. While concentrations of Arsenic and other metals vary considerably at the site, it is not clear that this is directly correlated with, and caused by, their respective concentrations in the fine-grained lacustrine deposits, and/or if so, to what extent. Background concentrations of COCs within the lacustrine deposits, coarser-grained alluvial sediments and/or any other soil types at the site have not been established, nor have their respective effects on water quality been determined. Background concentrations of metals and other COCs at the site are data gaps that must be filled in the Phase 4 investigation. Once established, the background concentrations will be used to better define and assess the extent of impacts at the site, as well as assessment of risks to potential receptors (risk assessment) and corrective action purposes.*

Response:

CGR agrees that background concentrations of metals or other COCs have not been defined for soil at the site. Limited soil sampling has not provided data to

establish background levels for soil, regardless of soil type. Investigation efforts so far have been focused mainly on characterization of groundwater quality in and around the Fire Pond (FP), the Former Arsenic Pond (AP) and the East Pond (EP). However, extensive groundwater quality data have been collected in areas upgradient of the AP in wells MW-3 and MW-15, and in deep groundwater grab samples collected at MW-15. Each phase of site investigation was approved by the Water Board via work plan. The groundwater quality data collected upgradient of the AP indicate that the naturally occurring concentrations of arsenic are highly variable. For example, dissolved arsenic concentrations in samples collected from similar depths (approximately 14 feet below ground surface (ft bgs)), range from 11.9 micrograms per liter (µg/L) in MW-3, to 201 µg/L in the groundwater grab sample collected from the MW-15 location. In groundwater monitoring well samples, sulfate has ranged from 3.1 milligrams per liter (mg/L) to 140 mg/L in MW-3, and was 26 mg/L in MW-15. Total Dissolved Solids (TDS) has ranged from 165 mg/L to 320 mg/L in MW-3, while TDS was 180 mg/L in MW-15. Based on the upgradient location, and based on the AP mounding analysis that will be provided by Geosyntec in the Revised Phase 3 Site Groundwater Investigation Report, groundwater data from the MW-3 and MW-15 area should be considered representative of background concentrations.

It bears particular emphasis that, in addition to samples collected at the site, groundwater monitoring well samples have been collected at the Cabin Bar Ranch property, approximately 0.75 miles to the north of the AP. The groundwater monitoring wells at Cabin Bar Ranch were installed at the location of a very similar hydrogeologic setting to that found at the site near the AP east of the Spring-line fault. Interfingered layers of alluvial and lacustrine sediment were logged in the soil core samples during drilling of the monitoring wells at Cabin Bar Ranch. Additionally, no discharges have occurred at this property to potentially influence the naturally occurring concentrations of metals or other COCs, and therefore the results from these monitoring wells are very analogous to the site and can be considered representative of background concentrations of the area. The dissolved arsenic concentrations of the monitoring wells at Cabin Bar Ranch range from 305 µg/L in WW-03 to 440 µg/L in WW-02. Additionally, sulfate has ranged from 110 mg/L in WW-01, to 190 in WW-03, and TDS has ranged from 920 mg/L in WW-03 to 1,580 mg/L in WW-02. Again, these Cabin Bar Ranch monitoring well results indicate that naturally occurring concentrations of COCs are highly variable in the site area and occur at concentrations higher than those found downgradient of the AP.

Based on the groundwater data collected upgradient at the site, and at the Cabin Bar Ranch, CGR believes that the range of background concentrations for COCs have been adequately defined. Additionally, CGR believes that the groundwater plume of COCs has now been fully delineated in the vertical and lateral direction based on the results of the Phase 3 investigation. The leak from the AP appears to be limited to the shallowest coarse-grained saturated layer and has not migrated vertically to impact coarse grained layers beneath the shallowest fine-grained layer as described in detail in Section 7.3 of the Phase 3 Groundwater Investigation Report.

CGR understands that background concentrations in soils are necessary to be established for risk assessment purposes. However, a determination of the effects that fine-grained and/or coarse-grained sediment may or may not have on groundwater concentrations, should not be pertinent to evaluating groundwater risks based on impacts from a release from the AP, as the range of COCs in groundwater in both the upgradient and downgradient directions has been fully delineated. Therefore, CGR strongly believes that background concentrations of COCs in groundwater can be determined with the data already collected, and risk assessment for groundwater can proceed at this stage of the investigation.

Comment #6, Page 2:

> *The July 13, 2016 Phase 3 Work Plan states that wells OW-8US and OW-8U would be monitored (bottom of page 12 of the July 13, 2016 Work Plan). No data was provided for OW-8U. Please add the monitoring and sampling of wells OW-8US and OW-8U to the next round of quarterly monitoring and sampling at the site. Water samples collected from these wells must be collected using low-flow purging and sampling methods (or equivalent), and the sampled tested for the same metals and other COCs as those tested for in the groundwater monitoring wells at the site.*

Response:

As stated on page 12 of the July 13, 2016 Phase 3 Work Plan, wells OW-8US and OW-8U were proposed to be used to evaluate vertical groundwater gradient. The July 13, 2016 Phase 3 Work Plan clearly states in the end of the third bullet point on page 12: "*In addition, vertical groundwater gradients will be evaluated by measuring groundwater level elevations in MW-03 and MW-15, and at MW-12, OW-8US and deep monitoring well OW-8U. Well OW-8US is screened in a*

deeper portion (from 55- 75 feet below ground surface [ft bgs]) of the shallow groundwater zone. OW-8U is located in the proposed MW-12 area and is screened in a deeper aquifer from 190 to 230 feet bgs."

Wells OW-8U and OW-8US were not proposed to be sampled for water quality in the July 13, 2016 Phase 3 Work Plan. The purpose of these wells was to evaluate the upward groundwater gradient at the site. Both wells OW-8US and OW-8U are in artesian conditions; well OW-8US has a wellhead pressure of approximately 2 pounds per square inch (psi) and OW-8U has a wellhead pressure of approximately 12 psi. These data will be provided in the Revised Phase 3 Site Groundwater Investigation Report.

The vertical profile of groundwater quality results from grab samples collected at boring B-02 clearly indicate that COCs have been delineated vertically, and do not extend below the uppermost fine-grained layer at approximately 12.5 ft bgs beneath the AP. Sampling wells OW-8US and OW-8U that are down-gradient approximately 1,450 feet from the AP, and with screen at depths between 55-75 and 190-230 ft bgs respectively, does not provide useful investigative data and it is not relevant to the objectives of the investigation. Furthermore, groundwater quality data from OW-8US were collected and provided in the Phase 3 Groundwater Investigation Report. Well OW-8US is also monitored and sampled as part of the Cabin Bar Ranch Groundwater Monitoring, Mitigation, and Reporting Plan (GMMRP) program. Results from sampling of this well have been provided to the Water Board. Results from OW-8US indicate that no constituents exceed primary or secondary Maximum Contaminant Levels (MCLs), which clearly indicates that COCs have not migrated vertically to the screen depths of this well. Therefore, CGR believes that sampling of wells OW-8U and OW-8US is not reasonable or necessary for the purposes of this investigation.

Comment #8, Page 3:

> *Please add the monitoring and sampling of spring piezometer SS-1 to the next round of quarterly monitoring and sampling at the site. Water samples collected from this piezometer must be collected using low-flow purging and sampling methods (or equivalent), and the samples tested for the same metals and other COCs as those tested for in the groundwater monitoring wells at the site.*

Response:

The investigative objective of adding shallow piezometer SS-1 to the quarterly groundwater monitoring well schedule is not clear from the comment. Furthermore, this piezometer is not adjacent to any pond or other discharge location at the site and therefore, it is not understood why sampling of this piezometer is necessary. As stated previously, CGR believes sufficient data exist to characterize the background quality of groundwater in the site vicinity. Therefore, we do not believe data from SS-1 will augment any portion of the current investigations at the site. CGR respectfully requests that this requirement be eliminated.

Comment #12 Page 3 and 4:

> *Geosyntec states that soil boring B-1 is "located upgradient of any wastewater discharge outfall by more than 350 feet" and, based on its location, concludes that the elevated Arsenic and Molybdenum detected in the soil samples from B-1 are "representative of naturally occurring regional levels that are higher than the median California background levels" (page 24). Water Board staff does not concur with this conclusion. Staff has observed discharge from the Fire Pond to the ground surface immediately adjacent to the southeast corner of the Fire Pond. Additionally, the Fire Pond itself is immediately adjacent to both MW-1 and soil boring B-1. It is possible that leakage from the Fire Pond and/or the surface discharges adjacent to it could be the source of the elevated metals in soil in this area. Site-specific background concentrations are needed to evaluate the results of Arsenic, Molybdenum and other metals detected in the soil samples from this location.*

Response:

The waste water that discharges to the FP is spill water in the bottling process and a small volume of water discharged during sanitation of the bottling equipment. All the water that discharges to the FP has been previously filtered by the arsenic filters at the plant. A simple review of the waste water quality data from the FP indicates that water quality at the FP could not reasonably be expected to impact soil beneath or around the FP. Grab samples were collected from the standing water in the FP and in the wastewater stream discharging to the FP in 2014, and the results were provided in Tables 2, 3, 4, and 5 of the Phase 1 Site Groundwater Investigation Report, dated February 16, 2015. Total

and dissolved molybdenum was not detected above the laboratory minimum reporting limit (MRL) for the samples collected in the FP or in the wastewater stream. Total and dissolved arsenic was not detected above the MRL in the sample collected from the waste water stream, however, dissolved and total arsenic were detected in the standing water of the FP at concentrations of 2.6 and 1.4 micrograms per liter (µg/L). The concentrations of arsenic detected in the FP could not reasonably be expected to impact soil if there were a leak from the FP.

Additionally, the highest arsenic concentration in the soil samples collected from boring B-1 were found at a depth of 15 ft bgs at a concentration of 23.1 milligrams per kilogram (mg/kg). Samples collected at 5 and 10 ft bgs contained arsenic concentrations of 1.34 and 1.61 mg/kg, respectively. If a leak from the FP occurred and impacted soil, it would be expected that the 5 and 10 ft bgs soil samples would also be impacted at higher or equivalent concentrations as the detection at the 15-foot level. The soil samples collected in B-1 were also described as moist, but not saturated. A significant leak from the FP would likely cause soils below the FP to be wet or near saturated. This was not the case.

In further analysis of this issue, groundwater concentrations of arsenic at well MW-01 indicates that these metals are not elevated above the background level observed in production wells located west of the Spring-Line fault. For example, the range of concentrations in MW-01 of total arsenic were 11.3 µg/L to 17.6 µg/L, and total molybdenum were 2.08 µg/L to 11.9 µg/L, while the range of concentrations in CGR-2 and CGR-7 production wells were 10 µg/L to 23 µg/L respectively, for total arsenic. The groundwater concentrations of arsenic and molybdenum in MW-01 are not indicative of significant impacts or a release from the FP.

Thus, arsenic and molybdenum concentrations in soils in this area are unrelated to discharges from the Fire Pond and further analysis of the issue is unwarranted.

Comment #15, Page 4 and 5:

> *Geosyntec's recommendations (page 27), were previously addressed in Water Board staff's 11/14/16 email. As accepted therein, Total and Fecal Coliform and Semi-Volatile Organic Compounds (SVOCs) can be eliminated from the quarterly groundwater monitoring analytical program. However, as also stated therein, staff does not support elimination of analyses for volatile*

organic compounds (VOCs). VOCs have been detected in wastewater samples from the Facility, and in grab groundwater samples from soil/hydropunch boring AP-2 (downgradient of the Arsenic Pond). Additionally, VOCs are consistently detected in soil gas samples from the soil vapor probe installed adjacent to the Arsenic Pond. These conditions are indicative of a release of VOCs at the site. Therefore, VOCs remain a constituent of concern and must continue to be analyzed in the groundwater and soil vapor probe monitoring program. The frequency for monitoring will remain unchanged at quarterly. Additionally, VOCs (including chlorinated hydrocarbons and trihalomethanes) will be required for analysis in the soil and groundwater samples collected beneath and near the former Arsenic Pond and appurtenances in the Phase 4 investigation.

Response:

The detections of VOCs in the groundwater grab sample from boring AP-2 included benzene, styrene, and toluene. Benzene was detected at a concentration that slightly exceeded the MCL; however at an estimated concentration. Well MW-04 was later installed at the location of AP-2 and has been sampled on a quarterly basis since the third quarter 2015. There have been no detections of benzene, styrene, or toluene or any other VOCs above the laboratory MRL in well MW-4, or any groundwater monitoring wells at the site since quarterly monitoring was initiated. Clearly, these results indicate that VOCs have not been discharged to groundwater at concentrations that impact the groundwater quality. As previously indicated, CG Roxane and Geosyntec believe the previous detections were attributable to a field or laboratory cross contamination error.

Concentrations of VOCs detected in wastewater grab samples in 2014, including 2-butanone, dichloroacetic acid, acetone, and cis-1,3-dichloropropene, were detected just slightly above the laboratory MRLs in wastewater samples, and were not found at concentrations exceeding any established MCLs. These are not compounds that are used at the site or that would be discharged to any drains in the plant. Furthermore, a total of four composite waste water samples (two from the FP and two from the EP) were also collected in February and April 2016, as required for the Report of Waste Discharge. The composite samples did not contain any detections of VOCs above the laboratory MRLs.

As discussed previously in quarterly groundwater monitoring reports and in the Phase 3 Groundwater Investigation Report, soil vapor concentrations detected in the soil vapor probe adjacent to the AP have had very low detections of various VOCs. The detections of VOCs in soil vapor have consistently not been the same compounds for each sampling. The detections of VOCs in the soil vapor samples are also typically not reproducible in duplicate samples or in separate sampling events. This indicates that the VOC data is potentially spurious and possibly due to lab cross contamination. Furthermore, the concentrations of VOCs in the soil vapor are orders of magnitude lower than any established cleanup guideline for vapor intrusion and, even if present, would not pose a risk to human health or the environment.

The lack of VOCs detections in the groundwater monitoring wells or in the process wastewater indicate that VOCs are not being discharged to the environment at the site. Detected VOCs in the soil vapor are also not impacting groundwater quality and, even if present, will not impact human health or the environment. Therefore, we respectfully request that VOCs should not be considered a contaminant of concern, and should be eliminated from the analytical testing program for groundwater and soil vapor.

Comment #16, Page 5:

> *Please submit complete copies of all monitoring and sampling reports prepared in accordance with the GMMRP for the Cabin Bar Facility. Please be sure to submit both existing GMMRP reports and all future reports moving forward.*

Response:

CGR will submit all GMMRP reports electronically to the Water Board including past and all future reports going forward.

Comment #17, Page 5:

> *The information provided in the Technical Memorandum is helpful in evaluating the site in context with the overall picture in the site vicinity. Water Board staff acknowledges that substantially higher Arsenic concentrations, as well as other metals and salts, are present in and toward Owens Lake northeast of the site. When evaluating onsite concentrations at the Facility, however, vastly*

> *lower concentrations of Arsenic and other COCs are present, including concentrations of Arsenic well below the MCL of 10 µg/L, and in some locations, below the detection limit. As previously stated, the absence of site-specific data/concentrations of COCs prior to any waste discharges at this site is problematic. This, in tandem with the broad range of concentrations in the area, necessitates a statistically significant background concentration study be performed at the site to establish background concentrations, and/or a range of background concentrations at the site. Establishing background concentrations is also necessary for risk assessment and corrective action purposes, which will be included in the amended investigative order for the site, to be issued within the next couple of weeks.*

Response:

The objective of the October 2016 Technical Memorandum (Memo) was to evaluate the impacts of potential arsenic releases from the AP relative to natural background arsenic concentrations that occur in and around the site. Geosyntec performed considerable analysis of this issue, including the updating of the groundwater model. Additionally, the Memo provided an analysis of groundwater quality at the site to evaluate if impacts from the AP would contaminate any water supply wells or create any material harm to the environment or reasonably foreseeable beneficial uses of the waters of the State now or in the future. The Memo concluded that shallow impacted groundwater that can be attributed to leaks from the AP will not migrate to any existing water supply wells. This conclusion is based on fate and transport modeling that concludes that groundwater in the area of the AP migrates to the northeast towards Owens Dry Lake, where extremely elevated naturally occurring concentrations of metals and salts exist. Therefore, impacted groundwater will not only be migrating to a location where there are no drinking water wells nor will be any in the foreseeable future, but will also migrate to an area where groundwater is of exceptionally poor quality and will not impact waters of the State.

CGR understands and agrees that establishing background concentrations is a critical component in evaluating potential impacts to water quality, and is a primary objective in determining risks and potential corrective actions. For this reason, CGR has spent considerable time and resources analyzing the groundwater quality at the site as well as the groundwater system. The

groundwater sampling that has been completed at the site has established a range of concentrations of COCs in both the upgradient and downgradient directions of the AP. The locations that are particularly relevant for establishing background concentrations in the area of the AP are from wells MW-3 and MW-15, and in grab samples at the MW-15 boring location. Additionally, CGR believes that it is indisputable that groundwater samples collected at the Cabin Bar Ranch provide a reasonable environmental analog to the area around the AP, and were found to be elevated at higher concentrations than are currently found downgradient of the AP. The geological makeup, hydrogeology and groundwater system at the Cabin Bar Ranch is near identical to that of the site. As previously stated, there have been no discharges at the Cabin Bar Ranch to impact water quality, and therefore CGR believes that these results are very relevant and analogous to evaluating background concentrations east of the Spring-line fault. As stated in the Memo, impacts from any potential releases of arsenic from the AP are not significant given the naturally high background arsenic concentrations in the general site area, including extremely elevated natural arsenic concentrations known to occur hydraulically downgradient of the AP area. While the Water Board's letter does not clearly define what "statistically significant" background concentrations are, the data collected from upgradient of the AP and at the Cabin Bar Ranch in areas east of the Spring-line fault is applicable and should be considered as representative of the background groundwater quality conditions for investigative and risk assessment purposes. Therefore, CGR believes that additional groundwater sampling is not necessary to establish background concentrations.

Finally, based on the general tone of the Water Board's comment letter, CGR is *highly* concerned that the Water Board will unreasonably expand its required analysis of background levels for groundwater in an effort to rebut CGR and Geosyntec's position that concentrations of COC's are within background, rather than for the purpose of assessing whether the release poses a material risk to any water supply wells in the area, the environment, or reasonable beneficial uses of the State. Therefore, we respectfully request that no further characterization of background groundwater quality be required.