

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD**

**SAN FRANCISCO BAY REGION**

**13267 INVESTIGATIVE ORDER No R2-2013-0005-A1**

**DIRECTING LEHIGH SOUTHWEST CEMENT COMPANY**

**TO SUBMIT**

**TECHNICAL AND MONITORING REPORTS PERTAINING TO WATER QUALITY**

**24001 STEVENS CREEK BOULEVARD, CUPERTINO**

**SANTA CLARA COUNTY**

The California Regional Water Quality Control Board, San Francisco Bay Region (Water Board) finds that:

- 1) Legal and regulatory authority:** This Revised 13267 Investigative Order (Order) conforms to and implements policies and requirements of the Porter-Cologne Water Quality Control Act (Division 7, commencing with California Water Code section 13000) including: section 13267; applicable state and federal regulations; all applicable provisions of statewide Water Quality Control Plans adopted by the State Water Resources Control Board (State Water Board) and the Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan and relevant standards, criteria, and advisories adopted by other state and federal agencies).
- 2) Discharger and facility:** Lehigh Southwest Cement Company (hereafter referred to as the Discharger) owns and operates a quarry, cement plant, and other operations related to the manufacture of cement at 24001 Stevens Creek Boulevard in Cupertino, California (hereafter "Permanente Facility"). Lehigh Southwest Cement Company is a subsidiary of its parent company, Lehigh Hanson, Inc., which is part of the Heidelberg Cement Group. The Permanente Facility was formerly operated under ownership of Hanson Permanente Cement, and Kaiser Cement Corporation.
- 3) Past Enforcement for alleged discharges to surface and groundwater:** The Discharger operates the Permanente Facility to produce cement from limestone and other raw materials mined onsite to create a product called "clinker," which is then mixed with other aggregate materials to produce concrete. Other operations at the Permanente Facility include rock excavation, crushing, and transport; waste storage; raw material and water storage; and wastewater treatment. The Regional Water Board has evidence to show that there have been discharges of quarry and process wastewater to both surface and groundwater from the Permanente Facility.

a) On February 18, 2011, the Regional Water Board's Prosecution Team issued a Notice of Violation and 13267 Order requiring the Discharger to submit technical reports providing information about alleged high volume discharges of quarry bottom waters.

b) On April 29, 2011, the Regional Water Board's Prosecution Team issued Complaint No R2-2011-0023 alleging an unauthorized discharge of process water to waters of the State.

c) On June 10, 2011 the Regional Water Board's Prosecution Team issued a 13267 Order requiring the Discharger to submit technical reports related to their discharges of stormwater and industrial process water to Permanente Creek.

d) On January 17, 2013 the Regional Water Board Prosecution Team issued a Notice of Violation for a failure to comply with the requirements of Water Code Section 13260, alleging an inadequate characterization of waste that could affect the quality of waters of the state.

**4) Regional Board Permitting process:** The June 10, 2011 13267 Order required the Discharger to submit a full Notice of Intent (NOI) to enroll under the General Permit for Aggregate Mining and Sand Washing/Offloading, NPDES No, CAG982001 (Sand and Gravel Permit), and to submit a full Report of Waste Discharge for all discharges to Permanente Creek by July 10, 2012. On June 28, 2011, the Discharger requested an extension for submission of both the NOI and the ROWD. The Assistant Executive Officer of the Regional Water Board extended the deadline to submit the NOI to July 15, 2011, and the ROWD to November 30, 2011.

a) On July 15, 2011 the Discharger submitted an NOI to enroll several discrete discharge points under the Sand and Gravel Permit, including Pond 13B, the Plant Reclaimed Water System, Pond 11, Pond 9, the Dinky Shed Basin, Pond 17, the Rock Sump Overflow, the Reclaim Water System Emergency Discharge Point, and Pond 20.

b) On October 20, 2012, the Discharger submitted a second NOI to enroll Pond 4A under the Sand and Gravel Permit.

c) On November 30, 2011, the Discharger submitted a Report of Waste Discharge (ROWD) to the Regional Board for all discharges from the Permanente Facility to Permanente Creek.

**5) Findings based on information contained in Regional Water Board files:** The findings of this Order are based on information housed in the Regional Water Board's files. The Regional Water Board has regulated the Permanente Facility since 1974 and maintains information about water quality monitoring reports, permit applications, enforcement actions, and other actions in its files.

**6) Previous submittals inadequate:** Previous Discharger submittals have not been prepared to acceptable standards. Adequate regulation must be based on adequate science and adequate reporting. To that end, this Order requires reports that meet specified quality requirements. Future submittals will not be accepted—and the

Discharger will be in violation of this Order—if reports do not rise to an acceptable level of accuracy and specificity as required by this Order.

**7) Acceptability of Work Product:** All work that the Discharger submits pursuant to this Order shall be acceptable to the Water Board Assistant Executive Officer and meet the criteria for all reports required for submission under this Order as detailed below.

**8) Need to Adapt Investigative Order to New Site Developments:** On April 24, 2013, the Discharger entered in to a Consent Decree with the Sierra Club in United States District Court for the Northern District of California. As part of the Consent Decree, the Discharger has agreed to perform extensive creek restoration in Permanente Creek, and will also improve the quality of its wastewater discharge through installation of treatment facilities. The January 2013 Investigative Order (R2-2013-0005) did not contemplate these developments. The Regional Board is issuing this modified Investigative Order to update requirements in order to collect necessary technical information to aid the creek restoration and treatment facility projects.

**9) Other Orders and Requirements of the Regional Board are still in effect:** This Order does not supersede, but supplements the Discharger's obligations under prior Orders issued by the Regional Water Quality Control Board. Components of this Order may be superseded by future individual NPDES Permit requirements for the Permanente Facility. Issuance of this Revised Order does not affect the Discharger's ongoing obligation to comply with the deadlines contained in the original Investigative Order (R2-2013-0005). Except where modified the existing requirements and legal enforceability of R2-2013-0005 are not superseded or affected by issuance of this Order.

### **Section A – Deficiencies in Previous Submissions**

**10) Information Submitted Related to the Outfalls for Permanente Creek Insufficient:** Requirement D of the June 2011 13267 Order required Lehigh to “identify all pipes, outfalls, and any other type of conveyance structure that drains into Permanente Creek and its tributaries” by July 10, 2011, later extended to September 30, 2011. Lehigh submitted a list of outfalls on September 30, 2011. In addition, lists of outfalls were provided in the July 15, 2011, Monitoring Plan, and later resubmitted in the October 17 2011 Monitoring Plan. However, Regional Board Staff determined the lists of outfalls submitted were not sufficient to meet the requirements of the June 2011 13267 Order.

**a)** The information submitted on July 15, 2011, September 30, 2011, and October 17, 2011 provided aerial photographs and a list of the outfalls. The Regional Water Board has determined this information was not sufficient to meet the requirements of the 13267 Order. The discharger failed to provide a narrative description of the origin of the water, flow path, and all materials and processes with which the water contacts prior to being discharged through the identified outfalls. It also did not provide the frequency and volume of discharge from all conveyances into

Permanente Creek. In addition, the Monitoring Plan identified outfalls using a confusing and cryptic identification scheme (p. 5-6, Figures 3-1 through 3-7).

**11) Full list of Outfalls to Permanente Creek not provided:** Lehigh did not submit a complete list of all pipes, outfalls, and conveyances as required by Requirement D. On March 26, 2012, US EPA staff discovered discharge from an unknown pipe a few hundred feet downstream of the discharge from Pond 4A. This outfall was not listed on Lehigh's July 10, 2011 or September 30, 2011 submissions.

**12) Water Process Flow Diagram and EPA Form 3510-2C Insufficient:** Requirement B of the June 13267 Order required the Discharger to provide a water process flow diagram by July 10, 2011, which was later extended to September 30, 2011. On September 30 the Discharger submitted a water process flow diagram along with the Notice of Intent for coverage under the NPDES General Sand and Gravel Permit. The Water Process flow diagram was revised pursuant to further discussions and re-submitted via email on October 25, 2011. In November, 2011 the Discharger submitted EPA Form 3510-2C as part of their Report of Waste Discharge for the NPDES Permit, which requires a water balance to be submitted. Regional Water Board staff and U.S. EPA staff have reviewed the revised water balance and Form 3510-2C and determined that it is insufficient to meet the intent of the requirements of the June 2011 13267 Order.

**a)** The water usage information relied on for modeling is almost entirely estimated, rather than obtained through measurement. The stormwater modeling results are of questionable value because of unsubstantiated modeling parameters and poor quality water flow data. Modeling results are also inconsistent with site observations of stormwater process water discharges made by Water Board staff during a storm event. A detailed breakdown of the inadequacies with the Water Balance Study is included as Attachment A.

**b)** Lehigh submitted a line drawing and water balance as part of their NPDES Report of Waste Discharge. The Line Drawing and Water Balance is required as part of the NPDES permitting process. The submission should be similar to the Figure 2C-1 provided in the EPA instruction sheet. Regional Water Board staff determined that the line drawing submitted was not sufficient.

**13) Drainage and Operations Map insufficient:** The June 13267 Order required the Discharger to provide a water process flow diagram by July 10, 2011, later extended to September 30, 2011. On September 30 the Discharger submitted a Drainage and Operations Map as part of a larger report. This report included several diagrams (Figures 7-1 through 7-3) that represented drainage and operations at the Permanente Facility. Regional Water Board staff and U.S. EPA staff have reviewed the report and determined that it is insufficient to meet the intent of the requirements of the June 2011 13267 Order. The maps and diagrams in the water balance study are of poor quality, they fail to show all discharge points to the creek, contain other errors, and are inconsistent with report text. A detailed breakdown of the inadequacies with the Water Balance Study is included as Attachment A.

**14) Volume of Water Discharged on Property is unclear:** The discharger releases stormwater, industrial process water, and stored groundwater from its property to Permanente Creek at five separate locations, possibly more. A continual flow monitoring device records the amount of water discharged from Pond 4A, however no additional information about discharge volume has been collected. Detailed information about the timing and amount of water discharged is necessary to determine the quantity of effluent discharged from the Permanente Facility in order to assess impacts from the Discharger's activities on Permanente Creek.

**15) Receiving water monitoring information submitted pursuant to Sand and Gravel General Permit does not meet requirements of the MRP:** On July 18, 2011, the Discharger sought coverage under the General Permit for Aggregate Mining and Sand Washing /Offloading, NPDES No. CAG982001(Sand and Gravel Permit). The Discharger submitted supplemental applications to obtain coverage for its outfalls dated July 19, 2011, September 28 and 30, 2011, and October 11, 19 and 25, 2012. On November 21 and November 22, 2011, the Regional Board confirmed that Lehigh has coverage under the Sand and Gravel Permit for a total of 8 discharge points from the Permanente Facility. Quarterly monitoring samples have been collected and submitted to the Regional Board. Some of these samples have not met the requirements of the Monitoring and Reporting Program (MRP) of the Sand and Gravel Permit, because the discharger failed to take receiving water measurements as required by Table E-5 of the MRP. This Order clarifies requirements for monitoring and reporting and requires the Discharger to submit complete, comprehensive information about its sampling program that ensures it is meeting the requirements of the Sand and Gravel Permit.

**16) The proposed background monitoring station does not measure background water quality conditions in Permanente Creek, and is not appropriate for determining NPDES discharge limits:** In 2011 the Discharger submitted a proposed monitoring plan for the Permanente facility as part of the Report of Waste Discharge. A background monitoring station is necessary to develop limits under the individual NPDES Permit. This report proposed monitoring background levels in Permanente Creek from the "Kaiser House." This monitoring station is located downstream from the western-most reaches of the Lehigh Property. Water quality testing from this location shows that the water contains high levels of hardness. Hardness factors will impact the allowable discharge limits for metals under the individual NPDES permit. Because water at this location may be impacted by industrial activities occurring on the Discharger's Property, including runoff from the West Material Storage Area, Water Board staff have determined that this location is unacceptable for determining background concentrations. Appropriate background water quality conditions must be determined in order to establish appropriate discharge limits.

**17) Data submitted under the 2011 13267 Order Does Not Reflect Normal Rainfall Conditions:** The June 2011 13267 Order required the discharger to take samples of surface water discharges to Permanente Creek and of Permanente Creek (Requirement H). Lehigh complied with this requirement by submitting Continual Flow

monitoring data and monthly sample results for outfall structures on the Permanente property. However, during the winter of 2011/2012, the State of California experienced less rainfall than average.<sup>1</sup> The information collected by Lehigh in 2011 may not accurately reflect the volume or duration of stormwater discharges expected during a normal rainfall year.

**18) Identity and Quantity of Hazardous Materials Used at Permanente Facility is Unknown:** Regional Board staff has reviewed evidence that shows that metals and hazardous materials associated with Kaiser Aluminum's operations, the historic wet-process cement kilns, and a former magnesium plant may be buried in the East Material Storage Area, the West Material Storage Area, and other places on the Permanente Site. In order to account for the possible discharge of hazardous materials to surface waters, the June 2011 13267 Order required Lehigh to test for the full suite of constituents listed under the California Toxics Rule (CTR). This requirement was imposed, and will continue to be imposed, because it is unknown what materials were disposed of in unregulated landfills at the Permanente Facility during its 70 year history of use.

**19) Data about chronic toxicity of discharges is required:** The Sand and Gravel Permit requires the Discharger to perform acute toxicity testing of its discharge twice per year. However, Water Board staff has reviewed evidence in the record, which shows that acute toxicity tests are not sufficient to detect potential impacts to beneficial uses as a result of ongoing operation of the Lehigh facility. Acute toxicity generally tests for impacts to aquatic organisms that occur over a very short time, usually four hours or less. The *2002-2007 Santa Clara Watershed Report* identified chronic toxicity problems in Permanente Creek downstream of the Permanente Facility. Chronic toxicity of water flea and green algae, and acute toxicity of fathead minnow were detected in water samples collected in Permanente Creek downstream of the Discharger's property. Additional chronic toxicity testing is needed to evaluate whether there are any impacts associated with dischargers from the facility and whether control measures may be needed.

## **Section B – Compliance Problems Related to Creek Restoration**

**20) Discharges prohibited under the Sand and Gravel Permit:** Sand and Gravel Discharge Prohibition III.1 states that, "the discharge shall not contain silt, sand, clay or other earthen materials from any activity in quantities sufficient to cause deleterious bottom deposits, turbidity, or discolorations in surface waters or to unreasonably affect or threaten to affect beneficial uses." Lehigh sought coverage under the Sand and Gravel Permit for the Permanente Facility in 2011, and is subject to this prohibition.

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<sup>1</sup> According to the National Weather Service, normal rainfall in the Los Altos Hills area is X inches in 1.00 inches in October 2011, 0.61 inches in November 2011, 0.16 inches in December 2011, 1.03 inches in January 2012, 0.76 inches in February 2012, and 1.97 inches in March, 2013, or 5.55 inches total. Los Altos Hills has already received 7.77 inches of rainfall between October 2012 and January, 1, 2013.

**21) Discharges prohibited under CAO 99-081:** Cleanup and Abatement Order Prohibition A.1. states that, “The discharge, or creation of potential for discharge, of any earthen materials, fresh concrete, cement, silt, clay, sand, organic material or any other pollutants that will significantly degrade water quality, and adversely affect beneficial uses of waters of the State is prohibited.” The Permanente Facility has been subject to the prohibitions of this Order since 1999.

**22) Historic sediment removal ponds for the Permanente Facility are located within the bed and banks of Permanente Creek, and are jurisdictional wetlands that are hydrologically connected to Permanente Creek:** In October, 2008 WRA Environmental consultants performed a wetland delineation of the Lehigh property. The study area encompassed 101 acres of land surrounding Permanente Creek and investigated both historic treatment ponds and the creek channel. The report concluded that at least 4 historic treatment ponds on the Lehigh property, including Ponds 13, 14, 21, and 22, were potentially jurisdictional wetlands. On March 2, 2009, the Army Corps of Engineers confirmed that these 4 ponds were indeed jurisdictional wetlands (USACE File No. 2008-00356S).

**a)** Pond 13 is an in-stream pond constructed between 1983 and 1989 within the bed and banks of Permanente Creek, originally as an open water sedimentation basin in response to complaints by Santa Clara Valley Water District (SCVWD) that discharges of sediment from the Permanente facility were impacting SCVWD’s infrastructure. Lehigh no longer uses this in-stream pond for this purpose, Pond 13 is treated as receiving waters. In 1994, off-stream Ponds 13A/B were constructed as sedimentation basins to reduce sediment that might enter the creek at Pond 13. The baseline volume of Pond 13 is approximately 15,950 cubic yards.

**b)** Pond 14 is an in-stream pond at the south east end of the Permanente property. Pond 14 was originally created as the last sedimentation basin before water was discharged from the property boundary. CAO 99-081 required a Pond 14 Bypass Work Plan and Implementation Schedule to restore the creek to a natural flowing condition by by-passing Pond 14, while maintaining wetland habitat in Pond 14, which was completed by Lehigh. Since that time, Pond 14 has not been used for its original purpose, and is treated as receiving waters. Further, no active management or maintenance of Pond 14 occurs due to the presence of federally-listed threatened California red-legged frog species. Currently, Pond 14 could be utilized as a diversion retention pond during a major storm event where upstream infrastructure is damaged or other emergency situations when additional storage capacity might be needed to capture excess sediment. The baseline design capacity of Pond 14 is approximately 9,150 cubic yards.

**c)** Pond 21 is a concrete structure that was originally created as an open water sediment basin to capture storm and other waters from the facility, which first pass through Ponds 19 and 20. Pond 21 has not been used for its original purpose since the jurisdictional wetlands determination, and is currently treated as receiving waters. It has a baseline design capacity of 252 cubic yards.

**d)** Pond 22 is an in-stream pond constructed as an open water basin connected to the main line of Permanente Creek through a concrete weir. It was

constructed in 1998 to increase sediment capture rate and improve sediment removal on the north east end of the property. Pond 22 has not been used to capture or handle sediment. Further, no active management or maintenance of Pond 14 occurs due to the presence of federally-listed threatened California red-legged frog species. The baseline design capacity of Pond 22 is 4,190 cubic yards.<sup>2</sup>

**23) Historic treatment Ponds 13, 14, 21, and 22 are waters of the state regulated by the Regional Board:** Ponds 13, 14, and 22 exist within Permanente Creek and now support wetlands and other aquatic resources. Pond 21 is not part of the Permanente Creek main channel, but has determined to be a Water of the United States due to the presence of wetlands. These ponds support hydric plant species indicative of wetlands and are all hydrologically connected to Permanente Creek and have the potential to impact the chemical, biological, and physical characteristics of this waterway. Unlike off-line constructed treatment wetlands, such as storage ponds at wastewater treatment plants that are clearly distinguishable from natural wetlands, historic sediment treatment ponds 13, 14, 21, and 22 at the Permanente Facility had the potential to adversely impact the continuing function of Permanente Creek. Therefore, each of these areas are subject to regulation by the Regional Board as waters of the state.

**24) Ponds 13, 14, 21, and 22 and Permanente Creek provide a number of beneficial uses under the Basin Plan:** The Basin Plan lists Permanente Creek as having Beneficial Uses of groundwater recharge, cold freshwater habitat, preservation of rare and endangered species, fish spawning, warm freshwater habitat, water contact recreation, non-contact water recreation, and wildlife habitat. The Beneficial Use of “preservation of rare and endangered species” relates to populations of California Red-Legged Frog (*Rana draytonii*; CRLF) population at the site and historic observations of anadromous trout (*Oncorhynchus mykiss*; steelhead)<sup>3</sup> at the site. The natural Permanente Creek channel and several of the ponds may be considered suitable habitat for CRLF.<sup>4</sup> Ponds 14 and 22 were determined to be occupied by CRLF in repeated protocol surveys, and provide breeding habitat for local populations. In 2000 CRLF was detected in Pond 13.<sup>5</sup>

**25) Lehigh failed to obtain the proper regulatory permits for ongoing maintenance of the historic in-stream ponds:** On September 19, 2008 Lehigh submitted an application for water quality certification to remove sediment from ponds and culverts at the Permanente facility. Water Board staff reviewed the application, but did not grant water quality certification because the application was deemed insufficient. Water Board Staff responded with an Incomplete Application Letter on October 17, 2008. Lehigh had not provided mitigation for impacts to wetlands that would be impacted in some of the ponds and proposed that the certification should be approved by the water board under a Categorical Exemption from the requirements of the

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<sup>2</sup> Huffman Broadway Group (HBG), 2008.

<sup>3</sup> Records show photographic evidence of Steelhead observed in Pond 14 as recently as September 5, 1997.

<sup>4</sup> HBG, 2008.

<sup>5</sup> *Id.*

California Environmental Quality Act (CEQA), arguing that the pond cleanout was maintenance for existing facilities, an action by a regulatory agency for the protection of natural resources, and an action by a regulatory agency for the protection of the environment. Water Board staff informed Lehigh that the categorical exemptions did not apply because the proposed sediment removal from the ponds could impact federally and state listed endangered species.<sup>6</sup> In 2009 Lehigh submitted a draft Streambed Alteration Agreement with California Department of Fish and Game (DFG), which proposed a 5-year workplan to remove sediment from Pond 13 annually between May 1 and October 15. On May 13, 2010, the draft Streambed Alteration Agreement was approved by DFG under an Operation of Law (OpLaw), which approves the draft Agreement without agency review but requires that the proposed project be implemented as described in the application materials. The Regional Board was not copied on this application, and did not find out about the OpLaw approval by DFG until work in Pond 13 was completed. In subsequent communications with the Water Board, Lehigh admitted that sediment was removed from Pond 13 in November, 2009, outside of the proposed seasonal work period in the draft Streambed Alteration Agreement. In addition, Lehigh did not notify the Water Board of the draft Streambed Alteration Agreement or the proposed work plan as required by Prohibition A. 2. of CAO 99-018, and did not obtain either 401 Certification or Waste Discharge Requirements for the work performed in November 2009 or in any subsequent year.

**26) Water quality impacts to Permanente Creek from historical operational use of Ponds 13, 14, 21 and 22 are unknown:** Throughout their operational lifespans, Ponds 13, 14, 21, and 22 have collected large amounts of sediment from Permanente Creek and/or the Permanente Facility. Between 1985 and 1997 Kaiser Cement would typically clean out sediment from Pond 13, the Permanente Creek bed, and Pond 14 in late summer.<sup>7</sup> Annual permits were acquired from SCVWD and California Department of Fish and Game to clean out sediment from Pond 14 using a Gradall hydraulic excavator, and large amounts of sediment were removed annually. However, due to a lack of targeted water quality sampling or sediment sampling, specific information about the quality of influent and effluent emanating from these ponds, as well as the impacts of ongoing maintenance activities of the ponds is unknown. It is likely that this quantity of sediment flowing in to the ponds has been reduced in recent years as a result of improved stormwater Best Management Practices (BMPs) at the site.<sup>8</sup> However, Water Board staff believe these ponds are still receiving significant amounts of sediment that could impact water quality in Permanente Creek. This could result in adverse impacts to beneficial uses, and would be a violation of the Sand and Gravel Permit if sediment entering the ponds was generated from the Facility.

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<sup>6</sup> Correspondence from SFBWQCB to Lehigh Southwest Cement dated October 17, 2008. Lehigh challenged this determination in correspondence from Diepenbrock and Harrison dated February 19, 2009.

<sup>7</sup> Correspondence to SCVWD from Kaiser Cement (Lon Rice) dated August 20, 1997.

<sup>8</sup> CAO 99-081 required a variety of BMP improvements at the Facility, and additional improvements were made by Hanson via stakeholder processes.

**27) The 2013 Consent Decree Calls for Removal of Pond 13, and modification of Pond 22:** The 2013 Consent Decree between Lehigh Southwest Cement Company and the Sierra Club requires extensive stream restoration along Permanente Creek. As part of this Consent Decree, Pond 13 will be completely removed, and Pond 22 will be altered to allow for fish passage. The Regional Water Board supports these restoration efforts, but believes that water quality sampling is necessary in order to evaluate possible water quality threats from potential historic sediment deposits in the in-stream treatment ponds, and to guide regulatory agencies in developing an agreeable plan to remove these ponds. More information is needed to determine what impacts, if any, result from the historic sediment deposits in Ponds 13, 14, 21, and 22.

### **Section C –Selenium Reporting Requirements**

**28) Regulatory Requirements for TMDL of selenium in Permanente Creek:** In 2006, Permanente Creek was added to the 303(d) list as impaired by selenium. Impaired water bodies are those for which water quality standards are not met or expected to be met after implementation of technology based requirements of the federal Clean Water Act (CWA). The CWA requires the San Francisco Bay Regional Water Board to report to the US EPA on the status of water quality in the State (Section 305(b) water quality assessment), and to provide a list of impaired water bodies (Section 303(d) list) as part of its ongoing regulatory requirements for 303(d) listed water bodies.

**29) Observed selenium concentrations are above water quality objectives (WQOs) in Permanente Creek:** Permanente Creek is listed as impaired for selenium because observed water column concentrations in the Creek were above the applicable National Toxics Rule water quality objective (WQO) for total selenium for chronic protection (5 micrograms/liter  $\mu\text{g/L}$ ) as 4-day average. The 303(d) listing was based on data collected by the Water Board's Surface Water Ambient Monitoring Program (SWAMP) in 2002/2003 at an upper reach location of the Creek (PER070, which is the East Fork of Permanente Creek at Rancho San Antonio). Reported total selenium concentrations at this location were all above the chronic WQO of 5  $\mu\text{g/L}$  at PER070 (5.8  $\mu\text{g/L}$ , 10.3  $\mu\text{g/L}$ , and 18.7  $\mu\text{g/L}$  respectively).<sup>9</sup>

**30) Selenium is toxic and bioaccumulative:** Selenium is a bio-accumulative reproductive toxicant. Excessive selenium dietary exposure has been linked to fish and bird deformities and deaths. Selenium is more toxic to vertebrates than to plants and invertebrates. Egg-laying vertebrates are most susceptible to selenium toxicity for reproduction.<sup>10</sup>

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<sup>9</sup> Surface Water Ambient Monitoring Program (SWAMP), Water Quality Monitoring and Bioassessment in Nine San Francisco Bay Region Watersheds in 2001-2003: Walker Creek, Lagunitas Creek, San Leandro Creek, Wildcat Creek/San Pablo Creek, Suisun Creek, Arroyo Las Positas, Pescadero Creek/Butano Creek, San Gregorio Creek, Stevens Creek/Permanente Creek, June 2007

<sup>10</sup> J. Skorupa, S. Morman, and J. Sefchick-Edwards, Guidelines for interpreting selenium exposures of biota associated with nonmarine aquatic habitats, March 1996.

Selenium occurs in four major forms in a water body, but selenate and selenite are the predominant forms in water column:

- Selenate (Se VI, as  $\text{SeO}_4^{-2}$ ), an analog to sulfate,
- Selenite (Se IV, as  $\text{SeO}_3^{-2}$ ), an analog to sulfite,
- Selenide (Se II), either as organoselenium or as inorganic selenide salts (insoluble), and
- Elemental selenium (Se 0).

High loadings of selenium are normally associated with disposal of coal fly ash, wastewater discharges from agricultural irrigation, mining, and oil refinery operations.<sup>11</sup> Selenium derived from geologic and anthropogenic sources is mostly in dissolved form, occurring mainly as  $\text{SeO}_4^{-2}$ .<sup>12</sup>

After selenium enters a water body, bioaccumulation can occur through a variety of processes. Dissolved selenium may slowly uptake by aquatic plants or organisms, such as phytoplankton, zooplankton, and insects, or selenium may bind with suspended solids or sediment.<sup>13,14</sup> Any form of selenium taken up by plants and microbes is converted to organic selenium (organo-selenide (Se II). Se II transformation to selenite (Se IV) occurs after the aquatic plants or micro-organisms die or consumed by other organisms.<sup>15</sup> Low levels of selenium in water can bioaccumulate to toxic levels in fish and wildlife via dietary exposure through the food chain.<sup>16</sup> Selenium concentrations in algae, microbes, sediments, or suspended particulates can be 100 – 500 higher than dissolved concentrations in streams and rivers, and as high as 1000 – 10,000 times in more stagnant waters, such as wetlands, estuaries, oceans.<sup>17</sup> Field studies have observed toxic effects on fish and birds when selenium water column concentrations were 1.5  $\mu\text{g/L}$  to 10  $\mu\text{g/L}$ .<sup>18</sup>

**31) Selenium monitoring data suggests discharges from Lehigh Facility may be a significant source of selenium:** Current operations at the Permanente Facility are contributing to the discharge of selenium to Permanente Creek, and have historically contributed to selenium discharges. The Discharger mines and processes limestone, and disposes of low grade limestone and overburden materials on the Permanente Facility property. Water and wastewater generated and discharged into Permanente Creek from the Discharger's operations originate from quarry pit

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<sup>11</sup> *Id.*

<sup>12</sup> Samuel Louma and Theresa Presser, 2009, Emerging Opportunities in Management of Selenium Contamination, Environ. Sci. Technol. 2009, 43, 8483–8487.

<sup>13</sup> Richard G. Burau, Environmental Chemistry of Selenium, California Agriculture, July-August 1985.

<sup>14</sup> A. Dennis Lemly, Selenium Transport and Bioaccumulation in Aquatic Ecosystems: A Proposal for Water Quality Criteria Based on Hydrological Units, Ecotoxicology and Environmental Safety 42, 150-156 (1999), Environmental Research, Section B, Article ID eesa.1998.1737, January 1998, available online at <http://www.idealibrary.com>.

<sup>15</sup> Lemly, D.A., 1999, *supra* note 14.

<sup>16</sup> Skorupa et al., 1996, *supra* note 10.

<sup>17</sup> Luoma and Presser, 2009, *supra* note 12.

<sup>18</sup> Skorupa et al., 1996, *supra* note 10.

dewatering, stormwater runoff from WMSA and EMSA, and other production areas including the Rock Plant, Surge Piles, Cement Plant, as well as the discharge of process wastewater from the production of aggregates and cement. Water quality monitoring of Permanente Creek near the Permanente Facility exhibits elevated selenium concentrations.

Discharges from Pond 4A dominate flows in this stretch of Permanente Creek. According to Lehigh's 2011 ROWD, discharges from the quarry pit dewatering have a long term average flow rate of 1000 gallons per minute (gpm) or 2.2 cubic feet per second (cfs), and can be as high as 2000 gpm during the wet season. This discharge outfall has the highest flow among all discharge outfalls from the Lehigh property, and represents a significant portion of the overall surface water flows in Permanente Creek.

Studies of the Permanente Facility show elevated selenium concentrations in Permanente Creek near the Permanente Facility. The Draft Environmental Impact Report for Lehigh Permanente Quarry Reclamation Plan Amendment (2011) identified that mined limestone at the Permanente Facility may leach selenium into the water that it contacts.<sup>19</sup> In 2009 and 2010, Golder Associates conducted monitoring at two locations on Permanente Creek.<sup>20</sup> At the downstream station, SW-2, which is downstream of the Quarry pit dewatering discharge point, total selenium ranged from 13 – 85.5 µg/L, with an average of 61 µg/L. These concentrations were much higher than those observed at an upstream station, SW-1, and those in an adjacent creek, the Monte Bello Creek station, SW-3, which was used as a clean background reference site for this study. Total selenium concentrations at SW-1 ranged from 2.3 – 9.2 µg/L, and at SW-3, they were around 0.5 µg/L or non-detected at 0.5 µg/L.

Recent water quality monitoring has confirmed the Discharger's contribution to selenium discharges to Permanente Creek. The 2011 13267 Order required Lehigh to conduct water quality monitoring for selenium and other constituents. In response to this requirement, Lehigh collected samples at two locations adjacent to its operations on Permanente Creek, at an upstream station near the historic Kaiser House, and at a downstream station outside its discharge area near the entrance gate of Heaven Cemetery. Selenium monitoring data collected in 2011-2012 at the Pond 4A discharge outfall had an average total selenium concentration of 56 µg/L (34 – 75 µg/L) (Lehigh Sep. Oct. 2011, 2012). WMSA and EMSA runoff concentrations ranged from 8.3 – 38 µg/L.<sup>21</sup>

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<sup>19</sup> Draft Lehigh Permanente Quarry Reclamation Plan Amendment Environmental Impact Report (Lehigh EIR), Santa Clara County, Department of Planning & Development Planning Office, December 2011.

<sup>20</sup> Golder Associates Inc., Hydrologic Investigation, Permanente Quarry Reclamation Plan Update, Rev. 1, November 2011.

<sup>21</sup> *Id.*

**Table 1. Sampling Locations on Permanente Creek and Total Selenium Concentrations**

<b>Station</b>	<b>Description of Station</b>	<b>Average Concentration (range, # samples) (µg/L)</b>	<b>Year of Data Collected</b>	<b>Source of Data</b>
SW-3	Monte Bello Creek station, used as a reference clean background site	<b>0.32</b> (<0.5 – 0.54, four samples)	2009 – 2010	Golder Associates (2011)
Upstream near Kaiser House	Near Kaiser House, upstream of all discharge outfalls	<b>6.5</b> (4.1 – 12, nine samples, excluding one suspected outlier)	2011 – 2012	Lehigh (Oct. 2011, 2012)
SW-1	Upstream of all discharge outfalls, maybe the same as Kaiser House station	<b>7.0</b> (2.3 – 9.2, four samples)	2009 – 2010	Golder Associates (2011)
Pond 4A	Quarry pit discharge outfall	<b>56</b> (34 – 75, 12 samples, excluding one suspected outlier)	2011 – 2012	Lehigh (Sep., Oct. 2011, 2012)
SW-2	Downstream of Quarry Pit discharges	<b>61</b> (13 – 85.5, four samples)	2009 – 2010	Golder Associates (2011)
Downstream near Cemetery	Outside of Lehigh facility, near the gate of Heaven Cemetery	<b>25</b> (12 – 41, nine samples)	2011 – 2012	Lehigh (Oct. 2011, 2012)
PER 70	Permanente Creek at Rancho San Antonio Open Space Preserve	<b>11</b> (5.8 – 18.7, three samples)	2002 – 2003	SWAMP (2007)
PER 10	Permanente Creek at Charleston Rd. (lower reach)	<b>2.5</b> (1.7 – 3.9, three samples)	2002 – 2003	SWAMP (2007)

Available water quality data, collected at different time periods and for different study purposes, suggests a selenium concentration gradient along the Creek that is higher near the Permanente Facility and decreases downstream. It appears that Lehigh's discharges maybe a significant source of selenium to Permanente Creek.

**32) A Selenium Impairment Evaluation is needed:** More information about selenium concentrations in Permanente Creek is needed in order for the Water Board to fulfill its regulatory requirements. Selenium that is discharged by the Permanente Facility into Permanente Creek is likely transported downstream where, through interaction with sediment and plants, transformation, deposition, uptake, and bio-accumulation of different elemental species of selenium may all occur. This process could result in significant impacts to the beneficial uses of Permanente Creek. Therefore it is important for the Discharger to submit a Selenium Study Workplan so the potential impacts to beneficial uses are better understood. Any proposed study should include the entire Creek, including reaches of Permanente Creek adjacent to the Permanente Facility and reaches of Permanente Creek downstream of the Permanente Facility and the Discharger's quarry discharge zone.

#### **Section D - Groundwater Investigation Site History Requirements**

**33) Threats to soil and groundwater:** The current and historic waste disposal practices at the Permanente Facility contributed to the disposal of waste contaminated with industrial materials. A review of historic documents revealed that the Former Kaiser Aluminum site was used for disposal of waste generated by both the Kaiser Cement Plant and the Kaiser Aluminum Plant. Historic areas of concern include:

- Dry Canyon Storage Area - storage of mine waste and manufacturing material from the cement plant, including kiln bricks.
- Impoundment Area – disposal of cement fill and other wastes (sludge).
- Upper Level Landfill – disposal of petroleum coke, filter cake, potliner waste, general waste disposal.
- Former Research Building Complex, Aluminum Foil Plant and Miscellaneous Buildings – manufacturing and possible disposal of magnesium, alumina and refractory carbon research waste.

**34) Waste associated with heavy industrial activity is known to exist on the site:** Several types of waste were ultimately disposed of on the Permanente Facility. Types of waste generated and disposed of onsite include cement kiln bricks used to line the kiln and contaminated with chromium disposed of on the adjacent Kaiser Aluminum facility, cement kiln dust generated by kiln contaminated with mercury (and other metals), and solvents and waste oils from machinery.

**35) On-site testing indicates contamination above environmental screening levels exists on the Permanente Facility:** Water Board staff reviewed the 1992 Woodward-Clyde Data Transmittal Report, the 1993 Emcon Environmental Evaluation Report, and the 1991 Ecology and Environment, Inc. Report. At the time these reports were written, the Site was defined as the Former Kaiser Aluminum property and the cement plant. These reports concluded that soil and groundwater on the Permanente Facility were contaminated above the Regional Water Board Environmental Screening Levels (ESLs).

<b>Soil Contamination *</b>		
<i>Contaminant</i>	<i>mg/kg</i>	<i>ESL (mg/kg)**</i>
PCB	400	0.74
TPH	58,000	83
As	10	1.6
Hg	346	10
Pb	120	750
Se	17	10
Th	50	16
Cd	104	7.4

\* Highest concentrations reported

\*\* Commercial/Industrial ESLs

<b>Groundwater Contamination *</b>		
<i>Contaminant</i>	<i>ug/L</i>	<i>ESL (ug/L) **</i>
Be	47	0.53
Ba	4900	1000
Cd	80	0.25
Cr	1,000	50
Cr-VI	10	11
Co	350	3
Cu	670	3.1
Sb	300	6
Pb	100	2.5
Ni	920	8.2
Hg	1	0.025
Se	50	5
V	1,100	15
Xylenes	12,900	20
Zn	1,500	81
TPH	60,000	100

**36) Full extent of environmental impacts from historic disposal practices is unknown:** Limited soil and groundwater sampling has occurred on the Permanente Facility, with the exception of some sampling associated with underground storage tanks. The extent and magnitude of contamination on the Discharger's property is unknown. The quantity of contaminated materials disposed of on-site, and the extent of impacts resulting from historic disposal practices is also unknown. The storage of mine waste, including kiln bricks, which may contain high levels of chromium and mercury, may have resulted in the discharge of metals to groundwater and surface water. More information is needed in order to identify sources of waste and develop cleanup strategies as necessary.

### NEED FOR ISSUANCE OF 13267 ORDER

**37) Technical reports pursuant to Water Code section 13267:** This Order requires the Discharger to submit technical reports pursuant to Water Code section 13267. Water Code section 13267 provides that the Water Board may require dischargers, past dischargers, or suspected dischargers to furnish those technical or monitoring reports as the Water Board may specify, provided that the burden, including costs, of these reports, shall bear a reasonable relationship to the need for the reports and the benefits to be obtained from the reports. In requiring the reports, the Water Board shall provide a written explanation with regard to the need for the reports and identify the evidence that supports requiring the reports.

**38) Need for and benefit of technical and monitoring reports:** Technical reports and monitoring reports are needed to provide information to the Regional Water Board regarding the following:

- a) The nature and extent of discharge at and from the Permanente Facility;
  - b) The nature and extent of pollution in waters of the state and United States created by the discharges;
  - c) The threat to public health and the environment posed by the discharges;
- and
- d) Appropriate cleanup and abatement measures, if necessary.

This Order requires technical information and monitoring data necessary to determine the nature and extent of all existing and future water quality impacts stemming from the Discharger's operations. Information required under this Order is necessary establish discharge standards under the NPDES Permit, and to determine the actions necessary to bring the Discharger into compliance with water quality standards. The reports required by this Order will enable the Regional Water Board to determine the extent of the discharges, ascertain if the condition of pollution poses a threat to human health and the environment in the vicinity of the Permanente Facility or downstream, and provide technical information to determine what cleanup and abatement measures and permits are necessary to bring the Permanente Facility into compliance with applicable water quality standards.

The monitoring activities required by this Order impose new regulatory requirements on the Discharger. More extensive water quality monitoring of the Permanente Facility and Permanente Creek are required under this Order, which will impose a significant expense on the Discharger. These reports are necessary to determine what steps may need to be taken to reduce the amount of pollution discharged from the Permanente Facility to waters of the state. No discharger has a vested right to pollute waters of the State of California. The benefits in eventual improved water quality in Permanente Creek outweigh the financial burden borne by the Discharger in performing additional monitoring and/or making improvements to its operations. Based on the nature and possible consequences of the discharges, the burden of providing the required reports

bears a reasonable relationship to the need for the reports, the costs, and the benefits to be obtained from the reports.

**IT IS HEREBY ORDERED**, pursuant to California Water Code section 13267 that the Discharger shall submit the following technical reports to the Water Board in response to the above findings as follows:

**1) Submission of Permanente Facility Key**  
**DEADLINE: April 22, 2013**

An inconsistent set of maps and nomenclature has evolved over time to describe the Facility. In order to understand historical practices and efficiently regulate the Permanente Facility, a consistent nomenclature is needed:

**a)** The Discharger shall submit a **Permanente Facility Key** that facilitates identification of site landmarks, drainage areas, creek reaches, industrial process areas, points of interest, outfalls, sampling locations, drainage pathways, and any other significant feature that have been tracked in the past. This Key should consist of a table, and shall include:

1. Points of interest, such as monitoring locations, outfalls, creek reaches, landmarks, historic and current structures, and industrial areas;
2. Historical “aliases” for each point (outfall, creek reach, physical feature, etc);
3. Date range and documents in which a nomenclature was used.
  - References to figures and tables shall be clearly defined, and the text, figures, and tables shall not contradict each other.
  - All terms (such as “substantial storm”, “emergency discharge”) shall be quantified and defined.
  - Maps shall include whole site and detail cut-outs and shall be developed in a manner such as to allow for topographic analyses. All relevant features (such as outfalls) shall be depicted and labeled.

**b)** Future submissions, including technical reports required by this Order should use the nomenclature identified in the Permanente Facility Key to reference points of interest.

## **SURFACE WATER DISCHARGE TECHNICAL REPORTS**

**2) Full list of Outfalls**  
**DEADLINE: April 22, 2012**

The Discharger shall provide a comprehensive list of all outfalls or discharge points to Permanente Creek originating on the Lehigh Permanente Property. This should include outfalls being sampled under the Sand and Gravel Permit, and any outfalls discharging or potentially discharging water to Permanente Creek. For each outfall, provide the following information:

- a) Identify and provide a detailed narrative description of each specific outfall location, as well as land use and industrial activities discharging or potentially discharging to the outfall.
- b) Submit a color photograph(s) that provide a fair and accurate representation of each specific outfall to Permanente Creek.
- c) Describe the source of water discharging to the outfall; and
- d) Provide a drainage map of each outfall in accordance with Section 4 below.

**3) Line Drawing of Flows, Sources of Pollution, and Treatment Technologies**  
**DEADLINES: March 22, 2013, April 22, 2013 and August 16, 2013**

The Discharger shall submit a Process Flow Diagram illustrating the source of, and route taken by, water throughout the Permanente facility from intake to discharge by **March 22, 2013**. The Discharger shall additionally submit a draft line drawing showing water flow through the facility, as called for by EPA Form 3510-2C, "Wastewater Discharge Information," Item II-A by **April 22, 2013**. The line drawing should illustrate the route taken by water throughout the Permanente facility from intake to discharge. The line drawing should show all operations contributing wastewater, including process and production areas, sanitary flows, cooling water, and stormwater runoff. Similar operations may be grouped together into a single unit, and labeled to correspond to the more detailed listing in item II-B. The discharger must use actual measurements whenever available. Line drawings should be similar to Figure 2C-1 which is provided in the form instructions on EPA Form 3510-2C. The final draft line drawing, with verified flow information, shall be submitted by **August 16, 2013**.

**4) Updated Drainage and Operations Map**  
**DEADLINE: April 22, 2013**

The Discharger shall submit a complete Drainage and Operations Map covering the entire Permanente Facility, which depicts where all water enters and exit each of the drainage and operational areas.

- a) The submittal shall be a comprehensive and complete depiction of all plumbing on site, and illustrate:
  - Direction of flow, with arrows indicating such;
  - Type of water (stormwater, industrial process water, comingled stormwater and industrial process water) and origin;
  - Drainage areas, Discharge locations, and manner of discharge.
- b) The submittal shall depict the mining and industrial materials, and any other potential pollutant sources and activities within the flow path of each water stream. **Maps should be of sufficient scale so topographic distinctions can be made and should be no less than 1"=100'.**
- c) The submittal shall identify any and all infrastructure used at the Facility to manage water flows. This includes routine, occasional, and emergency infrastructure and existing or potential discharge locations in relation to all various operations at the

Facility and the topography of the land. Examples of emergency discharge infrastructure include the Primary Lift Station bypass pipe (the subject of Administrative Civil Liability Complaint No. R2-2011-0023), and the sump pump area at the Rock Plant just above Permanente Creek.

**d)** The Discharger should use appropriate mapping methods to depict stormwater flow. For example, the Drainage and Operations Map should be created in ArcGIS using Arc Hydro or a similar program designed to accurately map surface water flow and should not be hand-drawn using AutoCAD.

**e)** The Discharger should submit a Digital Elevation Model (DEM) to the Regional Board in ArcGIS compatible format. If available, the DEM should consist of light detection and ranging data (LIDAR) information collected specifically for the Permanente Facility instead of publically available DEM files.

**f)** All data files used to create the Drainage and Operations Map, including the base layers, should be submitted to the Water Board in ArcGIS compatible format.

**5) Continuous Flow Monitoring Plan**  
**DEADLINE: March 13, 2013**

The Discharger shall evaluate each outfall to determine what equipment and structural modifications are needed in order to continuously monitor flow from all outfalls for volume and basic water quality constituents, such as pH, TSS, TDS, and temperature. The Discharger shall submit an implementation schedule for initiating flow monitoring at all discharge locations. Model-based estimates will not be accepted in substitution for continuous flow monitoring equipment.

**6) Submission of Background Monitoring Locations Plan and Reporting**  
**DEADLINE: Ongoing, beginning March 6, 2013**

Given the problems identified with using the Kaiser House sampling location as a background monitoring station, the Discharger shall take progressive steps to collect information about background water quality during the 2013 rainy season, and develop a workplan to identify an appropriate background monitoring station. The Discharger shall analyze background samples for the same set of constituents being analyzed for the other previously identified monitoring stations on the Permanente Facility. In addition, the Discharger shall analyze the background samples for temperature, hardness, and pH.

**a) Late Wet Season Sampling at Kaiser House:** To eliminate the influence of overland flow of stormwater from the West Material Storage Area at this location, the Discharger shall perform one **late season water quality sampling** at the Kaiser House location. The Discharger should perform this sampling between March 15, 2013 and May 1, 2013 at least forty-eight hours after the most recent storm event.

**b) Background Sampling of Wild Violet Creek:** The Discharger shall also perform one round of water quality sampling at Wild Violet Creek near its confluence with Permanente Creek. The Discharger should perform this sampling before May 1, 2013.

**c) Background Monitoring Location Identification Plan:** By **March 6, 2013**, the Discharger shall submit a Background Monitoring Location Identification Plan, acceptable to the Assistant Executive Officer. This plan should propose a total of four (4) or more alternative monitoring locations, within the Permanente Creek watershed as well as within neighboring watersheds, for consideration as background monitoring locations. For each proposed background station, the Discharger shall discuss the following:

- Ease of access;
- Land use (adjacent and upslope of sampling locations);
- Upstream disturbances or activities;
- Geologic formation over which stream flows before reaching sample location;
- Locations of perennial (annual) versus seasonal stream flow and timing of seasonal stream flow; and
- Options currently or historically used for background stations as well as new options.

**d) Background Monitoring Requirements:** The Discharger shall monitor proposed background stations as follows:

- Prior to approval of the Background Monitoring Location Identification plan, the Discharger shall sample each proposed background location and submit the sample results to the Water Board no later than **March 22, 2013**.
- In the first quarterly report following approval of the Background Monitoring Location Identification Plan, the Discharger shall begin to sample the approved background monitoring location only in accordance with the proposed plan and with the frequency specified in Section 7 of this Order.

**7) Updated Comprehensive Water Quality Monitoring Implementation and Reporting**  
**DEADLINE: Ongoing, beginning June 24, 2013**

Prior to issuance of the Facility's individual NPDES Permit, the Discharger shall monitor surface water outfalls in accordance with tables A.1. and A.2. These tables list all surface water sampling locations required for the Permanente Facility. Table A.1. summarizes ongoing sampling at the Permanente Facility, and corrects errors that have been identified in the Discharger's current monitoring program. Monitoring that overlaps with outfalls identified in the Sand and Gravel Permit may be appropriately referenced and does not need to be repeated to satisfy this Order. If an outfall is not discharging on the sampling day, the Discharger shall document that condition. To avoid confusion, many sampling locations are depicted in the maps contained in Attachment C. **The Regional Board notes that Latitude and Longitude coordinates submitted in the Discharger's NOI for the Sand and Gravel Permit were inaccurate.** Locations depicted on the Attachment C maps are approximate. Any errors should be noted by Lehigh and corrected by submission of accurate coordinate information for sample locations.

The Discharger shall submit quarterly reports with the data generated pursuant to this requirement within 60 days after the end of that calendar quarter (e.g., submittal May 30, August 30, November 30, and February 28). Once the Facility's individual NPDES Permit is adopted, monitoring required by the Sand and Gravel General Permit will cease, and the individual NPDES Permit will govern monitoring requirements.

**8) Chronic Toxicity Sampling:**  
**DEADLINE: Ongoing, beginning March 30, 2013, Sediment Toxicity Study Plan due by July 15, 2013**

The Discharger will perform chronic toxicity sampling to determine if its discharges to Permanente Creek are resulting in chronic toxicity to aquatic organisms.

**a) Location and Sampling Techniques**

- **Whole effluent and receiving water sampling at Pond 4A, Pond 9, Pond 13, and Pond 14:** The Discharger shall collect a 24-hour composite sample of discharge from Pond 4A, and representative grab samples of Pond 9 discharge and of flows from receiving water Ponds 13 and 14 for critical life stage chronic toxicity testing utilizing the fathead minnow, *Pimephales promelas* (Larval Survival and Growth Test Method 1000.0); the daphnid, *Ceriodaphnia dubia* (Survival and Reproduction Test Method 1002.0); and the green alga, *Selenastrum capricornutum* (also named *Raphidocelis subcapitata*) (Growth Test Method 1003.0). As specified in Test Methods 1000.0 and 1002.0, tests with *P. Promelas* and *C. dubia* will be conducted on a static renewal basis, with grab samples collected on day 1, 3, and 5.
- **Sediment Toxicity Study Plan.** The Discharger shall submit a sediment toxicity assessment study plan, consistent with U.S. EPA freshwater sediment toxicity testing guidance, by **July 15, 2013** for approval by the Assistant Executive Officer. Upon approval, the Discharger shall perform whole-sediment toxicity tests in accordance with the approved plan. The study plan shall identify specific sampling locations within Ponds 13, 14, and 22, a sampling schedule, testing species, test methods, and test end points (growth, survival, and/or reproduction). If possible, representative subsamples shall be collected from depositional areas in the inlet, middle, and outlet segments of each pond, and homogenized into a single sample for analysis. Both short-term and long-term end points shall be utilized for the selected test species. The plan shall also include a clear statement of the study purpose, QA/QC information, sample collection, handling, and test-preparation protocols, use of control and reference sediment samples, and information to be included in reports.

- **Special Requirements for Pond 14 and 22 Sampling.** Prior to sampling at Ponds 14 and 22 the Discharger shall confer with, and if necessary, seek approval from the California Department of Fish and Wildlife and U.S. Fish and Wildlife Service so as to avoid unnecessary disturbance of sensitive red legged frog habitat.

**b) Methodology:** Sample collection, handling, and preservation shall be in accordance with USEPA protocols. In addition, bioassays shall be conducted in compliance with the most recently promulgated test methods. Currently, methods for whole effluent and receiving water testing are contained in *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms*, currently 4th Edition (EPA-821-R-02-013). Methods for sediment toxicity testing are contained in *Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates (EPA 600/R-99/064)*. Dilution Series for whole effluent and receiving water toxicity testing. The Discharger shall conduct tests with a control and five effluent concentrations (including 100% effluent) using a dilution factor  $\geq 0.5$ .

**c) Frequency for whole effluent (Ponds 4A and 9) and receiving water (Ponds 13 and 14) toxicity testing:** The frequency of routine and accelerated chronic toxicity monitoring shall be performed as specified below:

- Undertake whole effluent (Ponds 4A and 9) and receiving water (Ponds 13 and 14) toxicity testing for one year, with a routine monitoring schedule of once per quarter. After one year, the discharger may request that the Assistant Executive Officer reduce or modify the quarterly sampling requirement.
- Accelerate monitoring to monthly for all sites exceeding a three-sample median of 1TUC or a single sample maximum of 2 TUC. The Assistant Executive Officer may specify a different frequency for accelerated monitoring based on the TUC results to ensure that accelerated monitoring provides useful information.
- Return to routine monitoring if accelerated monitoring after 3 samples does not exceed either trigger in bullet 2 above.
- If accelerated monitoring confirms consistent toxicity in excess of either trigger in bullet 2 above, continue accelerated monitoring and initiate toxicity reduction evaluation (TRE) procedures in accordance with section 8.g. below. Monitoring conducted pursuant to a TRE, for the species being investigated by the TRE, shall satisfy the requirements for routine and accelerated monitoring while the TRE investigation is underway. Routine monitoring shall continue for species not being evaluated under the TRE.
- Return to routine monitoring after implementing appropriate elements of the TRE, and either the toxicity drops below both triggers in bullet 2 above, or, based on the TRE results, the Assistant Executive Officer authorizes a return to routine monitoring. Monitoring conducted pursuant to a TRE effort shall satisfy the requirements.

**d) Frequency of whole-sediment toxicity testing (Ponds 13 14 and 22):**

The frequency of whole-sediment toxicity monitoring shall be performed as specified below:

- Undertake whole-sediment toxicity testing for one year, monitoring once in the dry season and once in the wet season at Pond 13. Sampling in Ponds 14 and 22 will be conducted in a manner that avoids unnecessary disturbance of sensitive red legged frog habitat. Due to the restriction on entering red-legged frog occupied habitat during the breeding season, the Discharger shall sample these ponds in the month of September 2013. A second round of representative sediment samples from these ponds should be collected on or before October 31 if the Permanente facility receives rainfall of more than 0.25 inches between the sample in September and October 31.
- No accelerated monitoring or TRE requirements for whole-sediment toxicity testing apply.

**e) Adjustments:** Exceptions may be granted to the Discharger in writing by the Assistant Executive Officer if specific identifiable substances in the discharge can be demonstrated by the Discharger as being rapidly rendered harmless upon discharge to the receiving water, compliance with the chronic toxicity limit may be determined after the test samples are adjusted to remove the influence of those substances. Written approval from the Assistant Executive Officer must be obtained to authorize such an adjustment.

**f) Chronic Toxicity Reporting Requirements Routine Reporting.** The Discharger shall submit the results of chronic toxicity sampling quarterly, within 30 days after the end of the quarter (e.g., submittal April 30, July 30, October 30, and January 30). As appropriate given the methodological differences between water column and whole-sediment toxicity testing, toxicity test results for the current reporting period shall include:

- Sample date
- Test initiation date
- Test species
- End point values for each dilution (e.g., number of young, growth rate, percent survival), as appropriate.
- No Observable Effect Level (NOEL) values in percent effluent, as appropriate. The NOEL shall equal to the IC25 or EC25. If the IC25 or EC25 cannot be statistically determined, the NOEL shall equal to the No Observable Effect Concentration (NOEC) derived using hypothesis testing. The NOEC is the maximum percent effluent concentration that causes no observable effect on test organisms based on a critical life stage toxicity test.
- IC15, IC25, IC40, and IC50 values (or EC15, EC25 ... etc.) as percent effluent, as appropriate.
- TUc values ( $TUc = 100/NOEL$ ), as appropriate.
- Mean percent mortality ( $\pm$ s.d.) after 96 hours in 100% effluent (if applicable and as appropriate)

- NOEC and LOEC values for reference toxicant tests.
- IC50 or EC50 values for reference toxicant tests
- Available water quality measurements for each test (pH, dissolved oxygen, temperature, conductivity, hardness, salinity, ammonia)

**g) Toxicity Reduction Evaluation (TRE) Requirements**

The following TRE requirements apply only to whole effluent (Ponds 4A and 9) and receiving water (Ponds 13 and 14) water column chronic toxicity testing. TRE requirements do not apply to whole-sediment toxicity testing.

- The Discharger shall prepare a general TRE work plan by **May 31, 2013** to be ready to respond to toxicity events. The Discharger shall review and update the work plan as necessary so that it remains current and applicable to the discharge and discharge facilities.
- Within thirty (30) days of exceeding either chronic toxicity trigger, the Discharger shall submit to the Regional Water Board a TRE work plan, which shall be the general work plan revised as appropriate for the toxicity event and after consideration of available discharge data.
- Within thirty (30) days of the date of completion of the accelerated monitoring tests observed to exceed either trigger, the Discharger shall initiate a TRE in accordance with a TRE work plan that incorporates any and all comments from the Assistant Executive Officer.
- The TRE shall be specific to the discharge and be in accordance with current technical guidance and reference materials, including USEPA guidance materials. The TRE shall be conducted as a tiered evaluation process, executed as appropriate given the specific nature of the observed toxicity and as detailed in the TRE work plan prepared under bullet 3 above.
- The TRE may be ended at any stage if monitoring finds there is no longer consistent toxicity to address.
- Use of Toxicity Identification Evaluation (TIE) shall be detailed in the TRE work plan and tailored to the specific toxicity event triggering the TRE. All reasonable efforts using currently available TIE methodologies shall be employed.
- As toxic substances are identified or characterized, the Discharger shall continue determining the sources and evaluating alternative strategies for reducing or eliminating the substances from the discharge. The Discharger shall take all reasonable steps to reduce toxicity to levels consistent with chronic toxicity evaluation parameters.
- The Regional Water Board recognizes that chronic toxicity may be episodic and identification of causes and reduction of sources of chronic toxicity may not be successful in all cases. Consideration of enforcement action by the Regional Water Board will be based in

part on the Discharger's actions and efforts to identify and control or reduce sources of consistent toxicity.

**9) Selenium Reporting Work Plan**  
**DEADLINE: May 17, 2013**

**Development of a Selenium Impact Assessment Work Plan:** The Discharger shall submit a Work Plan, acceptable to the Regional Water Board Assistant Executive Officer, to investigate the observed selenium gradient downstream of the facility and evaluate potential water quality impacts for its selenium discharges. The Selenium Impact Assessment Work Plan shall identify sampling locations (shown on a watershed map), parameters to be monitored, units of parameters, sampling schedules, analytical methods (minimum level, method detection limit, QA/QC procedures, etc.), and contract lab information.

**a) Selection of monitoring locations:** The study shall include sampling locations along the entire Creek down to San Francisco Bay, and focus on areas in which selenium accumulation or biological uptake is likely to take place. Permanente Creek is diverted to Stevens Creek via the Permanente Creek Diversion Channel approximately 4 miles upstream of the creek mouth at San Francisco Bay. During the wet season (October-April) all of the flow from Permanente Creek is diverted, except in rare cases of extremely high flows or potential for flooding. During the dry season, water can flow in Permanente Creek downstream of the diversion channel, but the channel is generally dry prior to the downstream confluence of Hale Creek. Therefore, sample stations should be focused on Permanente Creek upstream of the diversion channel, and on Stevens Creek downstream of the diversion channel, though some sampling on Permanente Creek downstream should be included when flows permit.

- **SWAMP Stations:** The sampling locations shall include some of the sampling stations on the Creek that were used in SWAMP monitoring on Permanente Creek in 2002-2003 (see Attachment B), upstream of the Permanente Creek Diversion Channel, and on Stevens Creek downstream of the Permanente Creek Diversion Channel, unless it can be documented that individual sites are not necessary to completely characterize Permanente Creek downstream of the discharger. Individual sites may be recommended for exclusion in the Work Plan if it can be shown that they do not add useful information to the study..
- **Potential North Side WMSA Runoff pathway leading to Permanente Creek:** The Discharger shall identify runoff pathways on the north side of WMSA and a monitoring location immediately downstream where such runoff enters Permanente Creek. If a station that is already required for monitoring satisfies this requirement, that station can be used and documented in the Work Plan.
- **Near-shore Location:** The Discharger shall propose a location at the margin of San Francisco Bay, downstream of Stevens Creek,

where the Stevens Creek enters the Bay or at a location where it receives inflow and sediment from the Creek.

- **Background Station:** The work plan shall identify four candidates for a representative background station to establish a reference site of ambient conditions for Permanente Creek. (This requirement is the same as is being required in the NPDES section of this order set forth in Directive 6.) The proposed background station candidates shall be located in an area that is dominated by open space, with minimal anthropogenic disturbance, and containing dense vegetation so that it provides shading for the Creek. For the purpose of this study, this background station should be located on Permanente Creek upstream and outside the Facility property boundary; or on an adjacent creek that has similar elevation, vegetation, shade, flow, slope, bank and sediment condition, geologic rock types, land use type (open space), etc. The Background Station for the work prescribed in this Directive will be the same as determined by Directive 6.

**b) Sampling frequency and duration:** Frequency of sampling is outlined in Table C, Monitoring Parameters and Frequency, and Table D, Monitoring Stations and Required Data, and described in Sampling Parameters, below. Sampling frequency for elemental dissolved selenium, particulate selenium, total selenium, and basic water quality chemistry should occur every month during the wet season (October – April), and quarterly during the dry season (June and September). Sediment monitoring for selenium, sulfate, grain size, and total organic carbon should be monitored quarterly. Monitoring shall be performed for two years. The Water Board will evaluate the first year's data and may adjust the sampling parameters, frequency, location, and study duration after the first year. The monthly and quarterly sampling will be used to identify seasonal variations.

**c) Sampling Parameters:** The study plan shall include the following parameters, at the location and frequency as specified in the ordered requirements, Tables C and D, below:

- **Selenium Species:** In addition to total and dissolved selenium, it is also important that the Discharger quantify, if possible, the four major forms of selenium, ie, elemental selenium (Se 0); selenide (Se II), selenite (Se IV), and selenate (Se IV), in water column (both dissolved and particulate) and in sediment. Selenium in sediment is an important pathway for microorganism's uptake of selenium. This information will be used in evaluating selenium fate and transport in the Creek and watershed. If laboratory methodologies do not exist to properly distinguish particulate selenium in the water column or in sediment, the Discharger shall propose an alternative methodology to Assistant Executive Officer in the Selenium Workplan.
- **Creek flow:** Creek flow is needed for estimating selenium mass loadings and transport.

- **Sediment grain size:** Sediment grain size (fine, sand, gravel, etc) shall be evaluated to examine the relationship between selenium concentration and sediment grain size, and sediment type at different segments of the creek.
- **Total Organic Carbon:** Total organic carbon in sediment may be an important factor for the partitioning and bioavailability of sediment-associated contaminants and therefore shall be monitored.
- **Other water quality parameters:** temperature, dissolved oxygen (DO), conductivity, oxidation reduction potential, alkalinity, total suspended solids (TSS), chlorophyll- $\alpha$ , and hardness shall be monitored. These are very basic water quality parameters to characterize water quality in the Creek. These parameters will also be needed for future selenium fate and transport modeling efforts.
- **Sulfate:** Sulfate in water and sediment shall be monitored because sulfate competes with selenate to alter its toxicity.

**10) Selenium Study Implementation and Reports**

**DEADLINE: 45 Days after Board approval of Selenium Study Work Plan**

**a) Immediate implementation:** The Discharger shall commence implementation of its proposed Selenium Study Work Plan after 45 days of submittal if the Assistant Executive Officer does not comment on it or as directed by the Assistant Executive Officer. If possible, the Discharger will conduct first sampling event in June 2013. Upon final amendment and approval by the Water Board Assistant Executive Officer, the Discharger shall continue implementation of the final approved Selenium Study Work Plan.

**b) Status Reports:** The Discharger shall submit quarterly sampling data within 30 days after the end of that calendar quarter (e.g., April 30, July 30, October 30, and January 30). The Discharger has the option to submit a first-year annual report, summarizing all the data collected for the first year, and request for changes to sampling frequency, sampling locations, or other adjustment of sampling scheme, based on first year's sampling results. The first annual report is due within 90 days after the first year's data collection.

**c) Final Study Report:** The Discharger shall submit a final study report at the conclusion of the second-year monitoring effort, within 90 days of final data collection. The report shall include, at a minimum, all data collected under this study, a summary of significant findings, any QA/QC issues, future monitoring needs, and proposed actions to address any selenium impairments associated with the discharges from the quarry areas.

## HISTORICAL TREATMENT POND WATER QUALITY ASSESSMENT

**11) Water Quality Impact Assessment Study for Historical treatment ponds (Ponds 13, 14, 21, and 22)**  
**DEADLINE: Beginning May 31, 2013**

The Discharger shall perform water quality sampling to investigate possible water quality impacts, if any, from the historical use of the in-stream treatment ponds (Ponds 13, 14, and 22) and Pond 21 until they are modified or removed in accordance with the Sierra Club Consent Decree. The sampling plan should be conducted to gather information necessary to assist both Lehigh and the Water Board in developing a pond removal and abandonment plan. Water Quality sampling shall be conducted semi-annually for two years as summarized below and Described on Table A.2:

- a) Location 27:** Inflow water quality samples collected upstream of Pond 13, near Creek Data Point 37 on the 2008 Wetland Delineation Map submitted by WRA Environmental Consultants.
- b) Location 25:** a grab sample should be taken in Pond 13 to test for the four major forms of selenium in the water column.
- c) Location 24:** Pond 13 outflow data collected downstream of the concrete weir. This is also a required sampling point for receiving water under the Sand and Gravel Permit. Sampling conducted in accordance with that permit does not need to be repeated, but should be reported in the quarterly reports required herein.
- d) Location 10:** a grab sample should be taken in Pond 21 to test for the four major forms of selenium in the water column.
- e) Location 9:** Outflow water samples from the Pond 21 complex.
- f) Location 8:** Inflow water quality samples collected immediately downstream of the culvert connecting Pond 21 and Pond 22. A separate sampling point is required here because it appears that there may be water quality impacts to Permanente Creek from bridge to the Permanente Facility.
- g) Location 7:** a grab sample should be taken in Pond 22 to test for the four major forms of selenium in the water column.
- h) Location 5:** Outflow samples for Pond 22 where creek is diverted from Pond 22 around Pond 14.
- i) Location 3:** grab sample should be taken in Pond 14 to test for the four major forms of selenium in the water column

The Discharger shall submit semi-annual sampling data within 30 days after the end of that period (e.g., July 30 and January 30). The Discharger shall submit an annual report, summarizing all the data collected for the first year. The annual report is due within 90 days after completion of the first year's data collection

## GROUNDWATER INVESTIGATION

### 12) Site History Description **DEADLINE: April 22, 2013.**

Submit a site history report that contains the following information. Provide separate site history discussions for mining-specific operations (sub-items i) and for general industrial and historic operations (sub items ii):

**a)** Chronology of waste disposal activities and other events that may have caused, or had the potential to cause, soil and groundwater contamination at the site. This chronology should be supported by all documents that provide information about past (and present) waste disposal or material storage activities that have been conducted at the site; and list of environmental investigations and reports conducted at the site; Responses to this directive should be organized as follows:

- i. Chronicle all waste disposal activities related to mining waste disposal, including but not limited to disposal of mining waste in the East Material Storage Area and West Material Storage Area
- ii. Chronicle all historic industrial waste disposal activities onsite, including
  - a. A description of all past and current activities having the potential to contaminate soil and groundwater at the site. This shall include a description of the operation, chemicals used, and wastes generated, recycled, stored, and disposed of on and off site. The description shall disclose any hazardous chemicals and wastes and indicate the maximum quantity of each chemical or waste material used, stored, or disposed of on and off site each year of operation. The description shall specifically consider and describe operations at the following locations, and any other locations where potentially contaminating materials may have been used, stored, or disposed:
    - Former asphalt plant;
    - Research building complex;
    - Former aluminum foil plant;
    - Former electrical substation;
    - Cement wet kiln processing areas;
    - Cement plant;
    - Dry canyon storage area;
    - Upper level landfill;
    - Former impoundment;
    - Brine Pond;
    - West Materials Storage Area;
    - East Materials Storage Area;
    - "Pearl Harbor"
    - Vehicle maintenance areas; and
    - Dry well.

**b)** Submit a map illustrating locations where contaminants may have been used, stored, or discharged where they may have caused, or had the potential to cause, soil and groundwater contamination at the site. Include on the map the locations of preferential pathways for groundwater, including but not limited to subsurface utilities lines on the property (e.g., sanitary sewer, storm drains,), or other pipelines, to the extent that this information is known or reasonably available; responses to this directive should be organized as follows:

- i. Areas where mining or cement manufacturing waste have been used, stored or discharged, including areas where mining waste may have been re-used to create berms, roads, or other infrastructure
- ii. Areas where any chemicals were used, and wastes were generated, recycled, stored, and disposed of on site, including any hazardous chemicals and wastes.

**c)** Information about any past chemical or waste spills or releases at the property, including type of spill or release, release location, and any remedial action taken. Copies of any supporting documents, such as letters, memos, etc.;

**d)** Copies of facility operational permits issued by any federal, state, or local regulatory agencies with respect to soil, groundwater and surface water quality;

**e)** A description of the sources consulted to respond to the above items (e.g., written records, former employees, local agency files); and

**f)** A statement that the information provided in response to the above items is full, true, and correct, under penalty of perjury.

**13) Source investigation work plan**  
**COMPLIANCE DATE: May 22, 2013**

Submit a work plan acceptable to the Assistant Executive Officer to inventory chemicals used on the site (by name and volume) and to identify all potential pollution sources, including chemical storage areas, sumps, underground tanks, utility lines, and related facilities. The work plan should specify investigation methods and propose a time schedule to characterize sources of pollution and investigate pollution in soil and groundwater. This investigation should specifically focus on

- a)** Sources of mining waste that have impacted groundwater, or have the potential to impact groundwater, including but not limited to the East Material Storage Area and the West Material Storage Area.
- b)** Onsite operations where industrial waste was stored, or may have been stored, including:
  - Former asphalt plant;
  - Research building complex;
  - Former aluminum foil plant;
  - Former electrical substation;
  - Cement wet kiln processing areas;
  - Cement plant;
  - Dry canyon storage area;
  - Upper level landfill;

- Former impoundment;
- Brine Pond;
- West Materials Storage Area;
- East Materials Storage Area;
- “Pearl Harbor”
- Vehicle maintenance areas; and
- Dry wells

**14) Source investigation report**  
**COMPLIANCE DATE: October 22, 2013**

Submit a technical report acceptable to the Assistant Executive Officer documenting completion of necessary tasks, including the results of soil and groundwater sampling, described in the work plan to identify sources. The technical report should identify confirmed and possible sources of pollution and, if needed, propose additional investigation to define the vertical and lateral extent of soil and groundwater pollution.

**GENERAL REPORTING REQUIREMENTS**

**Certifications for All Plans and Reports:** All technical and monitoring plans and reports required in conjunction with this Order are required pursuant to Water Code section 13267 and shall include a statement by the Discharger, or an authorized representative of the Discharger, certifying (under penalty of perjury in conformance with the laws of the State of California) that the work plan and/or report is true, complete, and accurate. Hydrogeologic reports and plans shall be prepared or directly supervised by, and signed and stamped by a Professional Geologist or Professional Civil Engineer registered in California.

**No Limitation of Water Board Authority:** This Order in no way limits the authority of this Water Board to institute additional enforcement actions or to require additional investigation and cleanup of the site consistent with the Water Code. This Order may be revised by the Assistant Executive Officer as additional information becomes available.

**Enforcement Options for Noncompliance with the Order:** Failure to comply with the terms or conditions of this Cleanup and Abatement Order will result in additional enforcement action, which may include the imposition of administrative civil liability pursuant to Water Code sections 13350 and 13268 or referral to the Attorney General of the State of California for such legal action as he or she may deem appropriate.

**California Environmental Quality Act compliance:** The issuance of this Order is an enforcement action taken by a regulatory agency and is categorically exempt from the provisions of the California Environmental Quality Act (CEQA) pursuant to section 15321(a) (2), Chapter 3, Title 14 of the California Code of Regulations.

**Right to Petition:** Any person aggrieved by this action of the San Francisco Bay Water Board may petition the State Water Board to review the action in accordance with Water Code section 13320 and California Code of Regulations, title 23, sections 2050 and

following. The State Water Board must receive the petition by 5:00 p.m., 30 calendar days after the date of this Order, except that if the thirtieth day following the date of this Order falls on a Saturday, Sunday, or state holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at: [http://www.waterboards.ca.gov/public\\_notices/petitions/water\\_quality](http://www.waterboards.ca.gov/public_notices/petitions/water_quality) or will be provided upon request.

It is hereby ordered.

for: Dyan C. Whyte  
Assistant Executive Officer  
Prosecution Team Lead

June 27, 2013

### **TABLES AND ATTACHMENTS**

Table A: Surface Water Monitoring Locations

Table B: Reporting Limits for Analytical Methods Selection and QA/QC Reporting Requirements (Surface Water Monitoring Constituents)

Table C: Suggested Selenium Study Work Plan Monitoring Parameters and Frequency

Table D: Monitoring Stations and Required Data

Attachment A: December 2, 2011 Memorandum from EPA

Attachment B: SWAMP Monitoring Locations

Attachment C: Lehigh Sample Locations Map

**Tables**

**Table A.1. –Existing Surface Water Monitoring Locations and Chronic Toxicity Monitoring Locations**

Location number <sup>22</sup>	Alias or Regulatory Compliance Requirement	Zone/Area of influence	Sample Point description	Outfall (O) or In-stream (S)	Method of Sampling	Purpose of water quality measurement	Frequency	Constituents Analyzed	New or existing regulatory requirement ?
1	Downstream sample location	Entire Site	50 feet downstream from the outfall for Pond 30 (current monitoring location in Gates of Heaven cemetery)	S	Grab Sample	Downstream sample required under Sand and Gravel Permit	Per Sand and Gravel Permit  Quarterly for Priority Pollutant metals	Sand and Gravel Conventional Pollutants plus CTR Priority Pollutant metals (Total) 1-13	<b>Existing;</b> required under Sand and Gravel Permit (current sampling location not appropriate)  <b>New:</b> CTR Priority Pollutant metals required by 13267 Order Section 7
3 also Table A.2	Pond 14  Receiving water chronic toxicity sample  Sediment sample	Pond 14/ Permanente Creek	Pond 14	S	Grab Sample  Sediment sample	Chronic Toxicity Sampling	Receiving water = Once per quarter, unless accelerated monitoring applies  Sediment= once per year	Toxicity sampling per Section 8	<b>New:</b> Required by 13267 Order Section 8

<sup>22</sup> Location numbers 2, 4, 16, and 30 in Table A of 13267 Investigative Order No. R2-2013-0005, dated January 22, 2013, were removed.

Location number <sup>22</sup>	Alias or Regulatory Compliance Requirement	Zone/Area of influence	Sample Point description	Outfall (O) or In-stream (S)	Method of Sampling	Purpose of water quality measurement	Frequency	Constituents Analyzed	New or existing regulatory requirement ?
5	See Table A.2								
6	SL-30-PD  Pond 30 outfall – SW4 (in NPDES ROWD)	Waste impoundment	East Materials Storage Area outfall	O	Grab Sample (when flowing)	Stormwater quality from EMSA	Per Industrial Stormwater Permit	Industrial Stormwater Permit plus CTR Priority Pollutant metals (Total) 1-13.	<b>Existing;</b> required by Industrial Stormwater permit  <b>New:</b> CTR Priority Pollutant metals required by 13267 Order Section 7
7 also Table A.2	Pond 22  Sediment toxicity sample	Entire Site	Pond 22	S	Sediment Sample	Chronic Toxicity Sampling	Sediment= once per year	Toxicity Sampling	<b>New:</b> Required by 13267 Order Section 8
8	See Table A.2								
9	See Table A.2								

Location number <sup>22</sup>	Alias or Regulatory Compliance Requirement	Zone/Area of influence	Sample Point description	Outfall (O) or In-stream (S)	Method of Sampling	Purpose of water quality measurement	Frequency	Constituents Analyzed	New or existing regulatory requirement ?
10 also Table A.2	Pond 21	Stormwater and historically Truck Wash	50 ft. downstream of Pond 20	S	Grab Sample (if discharging from Pond 20)	Receiving water quality downstream of Pond 20	Per Sand and Gravel Permit  Quarterly for Priority Pollutant metals	Sand and Gravel Conventional Pollutants plus CTR Priority Pollutant metals (Total) 1-13.	<b>Existing;</b> required under Sand and Gravel Permit  <b>New:</b> CTR Priority Pollutant metals required by 13267 Order Section 7
11	Pond 20 discharge point  S&G NOI  Outfall 005 (in NPDES ROWD)	Stormwater and historically Truck Wash	Outfall from Pond 20/Inflow for Pond 21	S	Grab Sample (when flowing)	Inflow sample for Pond 21	Per Sand and Gravel Permit  Quarterly for Priority Pollutant metals	Sand and Gravel Conventional Pollutants plus CTR Priority Pollutant metals (Total) 1-13.	<b>Existing:</b> required under Sand and Gravel Permit  <b>New:</b> CTR Priority Pollutant metals required by 13267 Order Section 7

Location number <sup>22</sup>	Alias or Regulatory Compliance Requirement	Zone/Area of influence	Sample Point description	Outfall (O) or In-stream (S)	Method of Sampling	Purpose of water quality measurement	Frequency	Constituents Analyzed	New or existing regulatory requirement ?
12	RWQCB I3 (Per June 2011 13267 Order)	Laboratory parking lot	Corrugated pipe from Laboratory building parking lot (S bank)	O	Grab Sample	Stormwater quality from laboratory parking lot	Per Industrial Stormwater Permit (though may not directly apply)	Industrial Stormwater Permit	<b>New:</b> Required by 13267 Order Section 7
13	Downstream receiving water Emergency Bypass	Cement Plant	50 ft. downstream of Emergency Bypass discharge	S	Grab Sample (if discharging from Emergency Bypass)	Receiving water quality downstream of emergency bypass	Per Sand and Gravel Permit  Quarterly for Priority Pollutant metals	Sand and Gravel Conventional Pollutants plus CTR Priority Pollutant metals (Total) 1-13.	<b>Existing;</b> required under Sand and Gravel Permit  <b>New:</b> CTR Priority Pollutant metals required by 13267 Order Section 7
14	Emergency Bypass  RWQCB H (per June 2011 13267 Order)  S&G NOI  Discharge	Reclaimed water system, cement plant, raw materials storage area (Truck Wash, Cement Plant)	Reclaim water system bypass outfall pipe	O	Grab Sample (when flowing)	Discharge water quality from Pond 11 bypass stormwater and process water	Per Sand and Gravel Permit  Quarterly for Priority Pollutant metals	Sand and Gravel Conventional Pollutants plus CTR Priority Pollutant metals (Total) 1-13.	<b>Existing;</b> required under Sand and Gravel Permit  <b>New:</b> CTR Priority Pollutant metals required by

Location number <sup>22</sup>	Alias or Regulatory Compliance Requirement	Zone/Area of influence	Sample Point description	Outfall (O) or In-stream (S)	Method of Sampling	Purpose of water quality measurement	Frequency	Constituents Analyzed	New or existing regulatory requirement ?
14 cont'd	Point 008(in NPDES ROWD)	Process and Cooling Water) <sup>23</sup>							13267 Order Section 7
15	Downstream Receiving Water Pond 17	Rock Plant	50 ft. downstream of Pond 17 discharge	S	Grab Sample (if discharging from Pond 17)	Receiving water quality downstream of Pond 17	Per Sand and Gravel Permit  Quarterly for Priority Pollutant metals	Sand and Gravel Conventional Pollutants plus CTR Priority Pollutant metals (Total) 1-13.	<b>Existing;</b> required under Sand and Gravel Permit  <b>New:</b> CTR Priority Pollutant metals required by 13267 Order Section 7
17	Pond 17 Outfall  S&G NOI  Outfall 004 (in NPDES ROWD)	Rock Plant, Haul roads	Outfall from Pond 17	O	Grab Sample (when flowing)	Pond 17 discharges	Per Sand and Gravel Permit  Quarterly for Priority Pollutant metals	Sand and Gravel Conventional Pollutants plus CTR Priority Pollutant metals (Total) 1-13.	<b>Existing;</b> required under Sand and Gravel Permit  <b>New:</b> CTR Priority Pollutant metals required by 13267 Order Section 7

<sup>23</sup> May also include reclaimed water from Rock Plant if Rock Plant is operating

Location number <sup>22</sup>	Alias or Regulatory Compliance Requirement	Zone/Area of influence	Sample Point description	Outfall (O) or In-stream (S)	Method of Sampling	Purpose of water quality measurement	Frequency	Constituents Analyzed	New or existing regulatory requirement ?
18	Downstream Receiving Water Dinky Shed Overflow	Rock Plant Haul roads	50 ft. downstream of Dinky Shed Basin overflow (when discharging)	S	Grab Sample  (if discharging from Dinky Shed Overflow)	Receiving water quality downstream of Dinky Shed	Per Sand and Gravel Permit  Quarterly for Priority Pollutant metals	Sand and Gravel Conventional Pollutants plus CTR Priority Pollutant metals (Total) 1-13.	<b>Existing;</b> required under Sand and Gravel Permit  <b>New:</b> CTR Priority Pollutant metals required by 13267 Order Section 7
19	Dinky Shed Basin Overflow  S&G NOI  Outfall 006 (in NPDES ROWD)	Rock Plant, Haul roads	Dinky Shed Basin low point overflow (if discharging)	O	Grab Sample (when flowing)  Discharge water quality if Dinky Shed sump not functioning	Dinky shed basin	Per Sand and Gravel Permit  Quarterly for Priority Pollutant metals	Sand and Gravel Conventional Pollutants plus CTR Priority Pollutant metals (Total) 1-13.	<b>Existing;</b> required under Sand and Gravel Permit  <b>New:</b> CTR Priority Pollutant metals required by 13267 Order Section 7

Location number <sup>22</sup>	Alias or Regulatory Compliance Requirement	Zone/Area of influence	Sample Point description	Outfall (O) or In-stream (S)	Method of Sampling	Purpose of water quality measurement	Frequency	Constituents Analyzed	New or existing regulatory requirement ?
20	Downstream Receiving Water Pond 9	Rock Plant Haul roads	50 ft. downstream of Pond 9	S	Grab Sample (if discharging from Pond 9)	Receiving water quality downstream of Pond 9	Per Sand and Gravel Permit  Quarterly for Priority Pollutant metals	Sand and Gravel Conventional Pollutants plus CTR Priority Pollutant metals (Total) 1-13.	<b>Existing;</b> required under Sand and Gravel Permit  <b>New:</b> CTR Priority Pollutant metals required by 13267 Order Section 7
21	Downstream Receiving Water Rock Sump Overflow	Rock Plant	50 ft. downstream of Rock Sump overflow (when discharging	S	Grab Sample (if discharging from Rock Sump Overflow)	Receiving water quality downstream of Rock Sump	Per Sand and Gravel Permit  Quarterly for Priority Pollutant metals	Sand and Gravel Conventional Pollutants plus CTR Priority Pollutant metals (Total) 1-13.	<b>Existing;</b> required under Sand and Gravel Permit  <b>New:</b> CTR Priority Pollutant metals required by 13267 Order Section 7

Location number <sup>22</sup>	Alias or Regulatory Compliance Requirement	Zone/Area of influence	Sample Point description	Outfall (O) or In-stream (S)	Method of Sampling	Purpose of water quality measurement	Frequency	Constituents Analyzed	New or existing regulatory requirement ?
22	Rock Sump Overflow S&G NOI	Rock Plant	Sample from Rock Sump area if sump not working	O	Grab Sample (if flowing)	Water quality from rock sump	Per Sand and Gravel Permit  Quarterly for Priority Pollutant metals	Sand and Gravel Conventional Pollutants plus CTR Priority Pollutant metals (Total) 1-13.	<b>Existing;</b> required under Sand and Gravel Permit  <b>New:</b> CTR Priority Pollutant metals required by 13267 Order Section 7
23	Pond 9 Outfall S&G NOI	Rock Plant, Haul roads; Cement Plant if Pond 11 discharging to Pond 9	Outfall from Pond 9	O	Grab Sample for S&G  Grab Sample for Chronic Toxicity Sample	Discharge water quality from Pond	Per Sand and Gravel Permit  Quarterly for Priority Pollutant metals  Whole-effluent= Once per quarter, unless accelerated monitoring applies	Sand and Gravel Conventional Pollutants plus CTR Priority Pollutant metals (Total) 1-13.  Toxicity per section 8 of Order	<b>Existing;</b> required under Sand and Gravel Permit,  <b>New:</b> CTR Priority Pollutant metals required by 13267 Order Section 7  <b>New:</b> chronic toxicity sampling required by 13267 Order Section 8

Location number <sup>22</sup>	Alias or Regulatory Compliance Requirement	Zone/Area of influence	Sample Point description	Outfall (O) or In-stream (S)	Method of Sampling	Purpose of water quality measurement	Frequency	Constituents Analyzed	New or existing regulatory requirement ?
24	Pond 13 downstream Receiving Water	Crusher	Permanente Creek 50 ft. downstream of Pond 13	S	Grab sample (if Pond 13 discharging)	Receiving water quality from Pond 13 discharges	Per Sand and Gravel Permit  Quarterly for Priority Pollutant metals	Sand and Gravel Conventional Pollutants plus CTR Priority Pollutant metals (Total) 1-13.	<b>Existing;</b> required under Sand and Gravel Permit  <b>New:</b> CTR Priority Pollutant metals required by 13267 Order Section 7
25	See Table A.2								
26 also Table A.2	Pond 13	WMSA; Quarry; Upper Permanente Facility	Sample Pond 13	S	Grab Sample  Sediment sample	Chronic Toxicity Sampling	Whole-effluent= Once per quarter, unless accelerated monitoring applies  Sediment= once per year	Toxicity Sampling	<b>New;</b> Required by 13267 Order Section 8

Location number <sup>22</sup>	Alias or Regulatory Compliance Requirement	Zone/Area of influence	Sample Point description	Outfall (O) or In-stream (S)	Method of Sampling	Purpose of water quality measurement	Frequency	Constituents Analyzed	New or existing regulatory requirement ?
27	Ponds 13A/B	Ponds 13A/B Stormwater Drainage Area	Sample outfall from Pond 13A to 13B (until or unless Ponds 13A and B are lined, at which point sample from 13B to Permanente Creek)	O	Grab Sample (when flowing)	Inflow water quality for Pond 13 and receiving water quality for Pond 13 discharges for Sand and Gravel Permit	Per Sand and Gravel Permit  Quarterly for Priority Pollutant metals	Sand and Gravel Conventional Pollutants plus CTR Priority Pollutant metals (Total) 1-13.	<b>Existing;</b> required under Sand and Gravel Permit (if coverage terminated, then proceed under Industrial Stormwater Permit)  <b>New:</b> CTR Priority Pollutant metals required by 13267 Order Section 7
28 also Table A.2	Creek Inflow to Pond 13	Inflow to Pond 13	Sample inflow to Pond 13	S	Grab Sample	Pond 4A downstream sample point; Background water quality of Permanente Creek before entering Pond 13	Per Sand and Gravel Permit  Quarterly for Priority Pollutant metals	Sand and Gravel Conventional Pollutants plus CTR Priority Pollutant metals (Total) 1-13.	<b>Existing;</b> required under Sand and Gravel Permit  <b>New:</b> CTR Priority Pollutant metals required by 13267 Order Section 7

Location number <sup>22</sup>	Alias or Regulatory Compliance Requirement	Zone/Area of influence	Sample Point description	Outfall (O) or In-stream (S)	Method of Sampling	Purpose of water quality measurement	Frequency	Constituents Analyzed	New or existing regulatory requirement ?
29	Historic buried pipe (south of Pond 4A)	"Mystery Pipe" discovered by EPA downstream of Pond 4A discharge	Previously un-discovered pipe in the vicinity of Pond 4 discharge	O	Grab Sample (when flowing)	Water quality of unknown discharge	Monthly when flowing	Sand and Gravel Conventional Pollutants plus CTR Priority Pollutant metals (Total) 1-13.	<b>New:</b> Required by 13267 Order Section 7
31	Pond 4A S&G NOI Outfall 001 (in NPDES ROWD)	Quarry Bottom and stormwater from WMSA	Pond 4A discharge	O	Grab Sample  Chronic Toxicity Sample	Water quality of quarry discharge	Per Sand and Gravel Permit  Quarterly for Priority Pollutant metals Chronic toxicity (see Section 8 or Order)	Sand and Gravel Conventional Pollutants plus CTR Priority Pollutant metals (Total) 1-13.  Chronic toxicity (see Section 8 or Order)	<b>New and Existing;</b> required under Sand and Gravel Permit, chronic toxicity sampling required by Order section 8, CTR Priority Pollutant metals required by 13267 Order Section 7

Location number <sup>22</sup>	Alias or Regulatory Compliance Requirement	Zone/Area of influence	Sample Point description	Outfall (O) or In-stream (S)	Method of Sampling	Purpose of water quality measurement	Frequency	Constituents Analyzed	New or existing regulatory requirement ?
32,33, and 34	Background Sampling Location	None	Wild Violet Creek (or Alternative Background Sample approved by Asst Exec Officer)	S	Grab Sample (when flowing)	Background Sample	Quarterly	Sand and Gravel Conventional Pollutants plus CTR Priority Pollutant metals (Total) 1-13.	<b>New:</b> CTR Priority Pollutant metals required by 13267 Order Section 7

**Table A.2: In Stream Pond Monitoring – Section 11 of 13267 Order**

Location number	Alias or Regulatory Compliance Requirement	Zone/Area of influence	Sample Point description	Outfall (O) or In-stream (S)	Method of Sampling	Purpose of water quality measurement	Frequency	Constituents Analyzed	New or existing regulatory requirement?
3	Pond 14	Entire site	Water from Pond 14 itself	S	See Order Sections 8/9/10	Water quality of Pond 14,	Semi-annual	Four major forms of selenium	<b>New;</b> Required by 13267 Order Section 11
5	SL-26/Pond 22 outfall	Entire site	Bottom of stairs where creek is diverted from Pond 22 around Pond 14	S	Grab sample (when flowing)	Discharge Water Quality from Pond 22	Semi-annual	Sand and Gravel Conventional Pollutants plus CTR Priority Pollutant metals (Total) 1-13.	<b>New;</b> Required by 13267 Order Section 11
7	Pond 22	Entire site	Sample from within Pond 22	S	Grab Sample	Determine water quality impacts of historical in-stream ponds	Semi-annual.	Four major forms of selenium	<b>New;</b> Required by 13267 Order Section 11

Location number	Alias or Regulatory Compliance Requirement	Zone/Area of influence	Sample Point description	Outfall (O) or In-stream (S)	Method of Sampling	Purpose of water quality measurement	Frequency	Constituents Analyzed	New or existing regulatory requirement?
8	Pond 22 Inflow	Reflects flow from all parts of facility upstream of influence of Ponds 19, 20, 21 and East Materials Storage Area <sup>24</sup>	Permanente Creek after RR culvert (under road bridge)	S	Grab Sample	Water quality of water flowing to Pond 22	Semi-annual.	Sand and Gravel Conventional Pollutants plus CTR Priority Pollutant metals (Total) 1-13.	<b>New;</b> Required by 13267 Order Section 11
9	Pond 21 outfall	Stormwater and historically Truck Wash	Discharge from Ponds 19, 20, and 21 Complex to Permanente Creek	S	Grab Sample (when flowing)	Discharge Water Quality of Pond 21	Semi-annual.	Sand and Gravel Conventional Pollutants plus CTR Priority Pollutant metals (Total) 1-13.	<b>New;</b> Required by 13267 Order Section 11

<sup>24</sup> EPA staff observed different color in water before culvert and after culvert; therefore, it is possible a hidden pipe joins creek as it flows through culvert

Location number	Alias or Regulatory Compliance Requirement	Zone/Area of influence	Sample Point description	Outfall (O) or In-stream (S)	Method of Sampling	Purpose of water quality measurement	Frequency	Constituents Analyzed	New or existing regulatory requirement?
10	Pond 21	Stormwater and historically Truck Wash	Pond 21	S	Grab Sample (if flow exists/discharging from Pond 20)	Discharge quality of Pond 21	Semi-annual	Four major forms of selenium	<b>New;</b> Required by 13267 Order Section 11
25	Pond 13 outflow	WMSA; Quarry; Upper Permanent Facility	Downstream of Concrete weir of Pond	S	Grab Sample	Water quality sample of Pond 13 discharges	Semi-annual	Sand and Gravel Conventional Pollutants plus CTR Priority Pollutant metals (Total) 1-13.	<b>New;</b> Required by 13267 Order Section 11
26	Pond 13	WMSA; Quarry; Upper Permanent Facility	Sample from Pond 13 directly	O	Grab Sample	Determine water quality impacts of in-stream ponds	Semi-annual	Four major forms of selenium	<b>New;</b> Required by 13267 Order Section 11
28	Creek Inflow to Pond 13	Inflow to Pond 13	Sample inflow to Pond 13	S	Grab Sample	Water quality of water flowing into Pond 13	Semi-annual	Sand and Gravel Conventional Pollutants plus CTR Priority Pollutant metals (Total) 1-13.	<b>New;</b> Required by 13267 Order Section 11

### Reporting Limits for Analytical Methods Selection and QAQC Reporting Requirements (Surface Water Monitoring Constituents)

When reporting the monitoring results, analytical methods, method detection limits (MDL), and reporting limits (RL) shall also be included in the reports.

Lehigh shall employ EPA approved analytical methods capable of achieving the Surface Water Ambient Monitoring Program (SWAMP) reporting limits of the constituents to be monitored. The SWAMP reporting limits are provided in *The State of California, Surface Ambient Monitoring Program, Quality Assurance Program Plan, Version 1.0, September 1, 2008*. Tables B1 through B5 below correspond to Tables C1 through C5 in the above mentioned SWAMP report (pages 62-64). These tables are included below as a reference, but not all of the included constituents are required to be tested as part of this Order. Furthermore, the SWAMP detection limits are included only as a reference. Many of these detection limits may not be achievable even under ideal conditions. Lehigh can collect and analyze samples in accordance with modified 1638/1640 methods for trace, ultra-low levels by a qualified laboratory familiar with SWAMP.

This document is also available online at

[http://www.waterboards.ca.gov/water\\_issues/programs/swamp/docs/qapp/qaprp082209.pdf](http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/qapp/qaprp082209.pdf)

**Table B.1: SWAMP Reporting Limits - Conventionals in Water**

Analyte	Water (mg/L)*
Ammonia (as N)	0.1
Biochemical Oxygen Demand	2
Boron	0.010
Chloride	0.25
Chlorophyll a Pheophytin a	0.002
Chemical Oxygen Demand (titrametric)	5
Cyanide	not listed
Dissolved Phosphorus (as P)	not listed
Fluoride	0.123
Iron	0.02
Nitrate (as N)	0.01
Nitrate + Nitrite (as N)	0.1
Nitrite (as N)	0.01
Oil and Grease (HEM)	1.4
Organic Carbon (Dissolved)	0.6
Organic Carbon (Total)	0.6
Orthophosphate (as P)	0.01
Phenols	not listed
Silica	0.1
Sulfate	1.0
Specific Conductivity	2.5 $\mu$ S/cm
Total Alkalinity (as CaCO <sub>3</sub> )	1

Analyte	Water (mg/L)*
Total Calcium	0.05
Total Hardness (as CaCO <sub>3</sub> )	1
Total Kjeldahl Nitrogen	0.5
Total Magnesium	0.02
Total Phosphorus (as P)	not listed
Total Potassium	0.1
Total Sodium	0.1
Turbidity	0.5 ntu

**Table B.2: SWAMP Reporting Limits - Conventionals - Aqueous Solids**

Analyte	Solids (mg/L)
Fixed & Volatile Dissolved Solids (500 C) 550 C	5.0
Suspended Sediment Concentration	0.5
Total Dissolved Solids	10
Total Suspended Solids (103-105 °C)	0.5
Volatile Suspended Solids	1.0

**Table B.3: SWAMP Reporting Limits – Conventionals - Pathogens**

Analyte	MPN/100 mL*
Pathogens – E. Coli	2
Pathogens – Enterococcus	1 colonies/100 mL
Pathogens –Fecal Coliform	2
Pathogens – Total Coliform	2
Pathogens - Streptococcus	not listed

\*Unless otherwise noted

**Table B.4: SWAMP Reporting Limits – Conventionals - Solids**

Analyte	Solids
Sediment Grain Size Analysis	1%
Sediment Total Organic Carbon	0.01% OC
%Moisture	n/a
%Lipids	n/a

**Table B.5: SWAMP Reporting Limits – Inorganic Analytes**

Analyte	Water	Sediment
	(µg/L)	(mg/kg)
Aluminum	0.3	0.3
Arsenic	0.3	0.3
Cadmium	0.01	0.01
Chromium	0.1	0.1
Copper	0.01	0.01
Lead	0.01	0.01
Manganese	0.01	0.01
Mercury	0.0002	0.03
Methylmercury	0.00005	0.00002
Nickel	0.02	0.02
Selenium	0.30	0.10
Silver	0.02	0.02
Zinc	0.10	0.10

For the heavy metals in water column as listed in Table B5 above (except aluminum, Manganese, mercury, and methylmercury), the recommended methods are either modified EPA Method 1638, 1640, or equivalent most updated methods that can achieve the above reporting limits; and for mercury, the suggested method is EPA 1631e.

For parameters that the SWAMP does not list reporting limits, or parameters that are not listed in the above tables, the methods selected shall be either the best available methods appropriate for clean surface water monitoring or able to detect the concentrations normally seen in clean ambient surface waters.

**Table C – SUGGESTED Selenium Study Work Plan Monitoring Parameters and Frequency**

Matrix	Constituents group	Parameters	Units	Minimum Sampling Frequency <sup>(1)(2)</sup>
Water column	Basic water quality/chemistry constituents	Total organic carbon	mg/L	Monthly wet season (Nov. – April)  Quarterly dry season (June and September)  30-day continuous monitoring once every quarter for temperature, pH, and DO at selected stations
		Temperature	Degree C	
		pH	Standard Unit	
		DO and DO saturation	mg/L, %	
		hardness	mg/L as CaCO <sub>3</sub>	
		TSS	mg/L	
		Chlorophyll- $\alpha$	mg/L	
		Sulfate	mg/L	
		Oxidation reduction potential	millivolts (mV)	
		Alkalinity	milliequivalent per liter (mEq/L)	
Water column	Dissolved selenium	Se VI	$\mu\text{g/L}$	Monthly wet season (Nov. – April)  Quarterly dry season (June and September)
		Se IV		
		Se II		
		Total dissolved Se		
	Particulate selenium (suggested)	Se VI	$\mu\text{g/L}$	Monthly wet season (Nov. – April)  Quarterly dry season (June and September)
		Se IV		
		Se II		
		Elemental Se		
		Total particulate Se		
	Total Selenium	Total organic Se	$\mu\text{g/L}$	Monthly wet season (Nov. – April)  Quarterly dry season (June and September)
		Total inorganic Se		
		Total Se		

Matrix	Constituents group	Parameters	Units	Minimum Sampling Frequency <sup>(1)(2)</sup>
Water	Flow	River flow	Cubic feet per second (cfs)	Monthly wet season (Nov. – April)  Quarterly dry season (June and September)
Sediment	Selenium	(Suggested) Total Se Se VI	µg/g dry weight (dw) and µg/g wet weight (ww)	Quarterly
	Sulfate	Se IV Se II Elemental Se Total organic Se Total inorganic Se Sulfate		
		Grain size		
	Total organic carbon	Total organic carbon	% carbon	Quarterly

**Table C notes:**

- (1) Sampling for all parameters shall occur on the same dates at all locations if possible.
- (2) One of the sampling events shall occur during the wettest month of the year, after a major rain event One of the dry season sampling shall occur during the driest month of the year.

**Table D – Monitoring Stations and Required Data**

Station	Description	Location	Lat/ Long	Water	Sedi- ment	Flow	Continuous Water Column
STE010 b	Near shore Station on Stevens Creek	37.42822	-122.06881	Yes	Yes	--	--
PER010 *	Permanente Cr at Charleston Rd	37.42118	-122.08673	Yes	Yes	--	--
HAL010	Hale Cr at Mountain View Avenue	37.38292	-122.09074	Yes	--	Yes	--
PER035	Permanente Creek at Covington Rd., 1000' downstream of diversion channel/PER0 40	37.36488	-122.08431	Yes	Yes	Yes	--
STE020*	Stevens Cr at La Avenida	37.41357	-122.0686	Yes	Yes	Yes	--
STE040*	Stevens Cr Below Diversion Channel	37.36475	-122.0622	Yes	--	Yes	--
PER045	Heritage Oaks Park	37.33634	-122.08717	Yes	Yes	Yes c	--
PER060	Permanente Creek at Rancho San Antonio Lower Bridge (Deer Meadow Trailhead)	37.33634	-122.09104	Yes	Yes	Yes	--
PER070*	Permanente Creek at Rancho San Antonio Upper Bridge (South Meadow Trailhead)	37.32941	-122.08586	Yes	--	--	--

Station	Description	Location	Lat/Long	Water	Sedi-ment	Flow	Continuous Water Column
PER080 d	West Permanente Cr	37.33335	-122.09381	Yes	--	Yes	--
WLD010e	Wildcat Creek, upstream of confluence with West Branch Permanente Creek	37.33335	-122.09381	--e	--	--e	--
Pond 14	Pond 14 (Permanente Creek on Quarry property)	37.32323	-122.08358	Yes	Yes, Sept 1-Oct. 31 only	Yes	--
Pond 13	Pond 13 (Permanente Creek on Quarry property)	37.31661	-122.01068	Yes	Yes	Yes	Yes--
WVC g	Wild Violet Creek, Background Station	37.32026	-122.13183	Yes	Yes	--	--

**Table D notes:**

<sup>a</sup> Several sites require access to be granted by Santa Clara Valley Water District or the Midpeninsula Regional Open Space District. Due to the tight timeframe for work plan preparation, as of the submission of this work plan, access has not been able to be guaranteed for every site. Therefore, locations are subject to change following coordination with these entities and the RWQCB.

<sup>b</sup> This station satisfies the requirement in the 13267 Order under the section titled "Near-Shore Location".

<sup>c</sup> Under high flow conditions, flow data may be obtained from the existing Santa Clara Valley Water District flow measurement station in the diversion channel, 900 feet downstream of PER045.

<sup>d</sup> This station satisfies the requirement in the 13267 Order under the section titled "Potential North Side WMSA Runoff pathway leading to Permanente Creek", since runoff pathways on the north side of WMSA drain via Wildcat Creek to the West Branch of Permanente Creek. Monitoring at this station will be able to quantify additional selenium loadings from storm water runoff from upstream areas. Loading at this station may originate from Wildcat Creek, which may contain storm water runoff from the north side of the WMSA, or from upstream areas on the West Branch Permanente Creek.

<sup>e</sup> Monitoring is not required at this station unless and until directed by Water Board staff. Water Board staff will evaluate the need to sample at this location based on data collected at PER080, site accessibility, and need to quantify loadings from storm water runoff from the north side of the WMSA into Wildcat Creek.

<sup>f</sup> The United States Fish and Wildlife Service has indicated that sediment sampling in Pond 14 will only be allowed between September 1 and October 31, to protect the endangered population of red-legged frogs in the pond.

<sup>g</sup> This station is the proposed background station, based on the requirement in the 13267 Order under the section titled "Background Station".

\* Denotes SWAMP monitoring location (SFBRWQCB 2007).

**Attachment A: December 2, 2011 Memorandum from EPA**



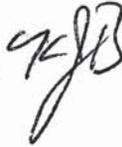
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 9

75 Hawthorne Street  
San Francisco, CA 94105-3901

2 December 2011

**Memorandum**

**To:** Greg Gholson, Environmental Scientist  
CWA Compliance Office

**From:** Katherine Baylor, Hydrogeologist  
RCRA Corrective Action Office 

**Subject:** Lehigh Cement Water Balance Study Review

At your request, I have reviewed the water balance study for Lehigh Cement. The study, titled, "Water Balance and Process Diagram Report, Lehigh Southwest Cement Company, Permanente Plant Site Cupertino, California," was dated 30 September 2011 and was written by Geosyntec Consultants for Lehigh Southwest Cement Company. Listed below are my comments. If you need more information, please contact me at 415-972-3351.

**General Comments**

1. General: The water balance report is insufficient as written. It contains inconsistencies, is difficult to follow, and has too few graphics and tables to support the text.
2. General: The water use information included in the report is almost entirely estimated. The only definitive water use data is derived from the municipal water supply billing records from San Jose Water Company. Water use within the site is not metered or quantified on a regular basis. On-site water distribution includes both above-ground and subsurface pipelines; few of the pipelines are metered. Efforts should be made to better identify the locations of all water lines on site (surface and subsurface), and document flow rates and water types (e.g., stormwater, reclaim water, municipal water).
3. General (Maps): The site topographic/drainage maps need significant improvement. The map set should include, at a minimum:
  - a) a topographic map of the entire facility, b) smaller maps (such as 7-1 through 7-3) that show the details of specific areas of the facility. The site-wide topographic map should clearly delineate (box) the locations of the detailed maps, similar to Figure A1 in Appendix A. The detailed maps should include all parts of the facility, including the quarry and Pond 4. All ponds and significant infrastructure elements on each map should be clearly marked and labeled. Directional arrows that show stormwater flow direction should be sufficient in number and location to indicate flow from

slope runoff to drainage conveyances to subsurface vaults, ponds, and impoundments and then to outfalls as appropriate. It may be useful to color-code the drainage areas and directional arrows to better document stormwater flow from the site to the outfalls. The topographic maps in the southern part of the facility should extend to Permanente Creek, which should be marked and labeled. These maps should also include the outfall locations. Although the outfall locations are shown in aerial photographs in Appendix A, they should be integrated with the topographic maps.

4. General: Lehigh may find economic benefits in conducting a more thorough water balance study in order to optimize water resources, potentially reduce the cost of purchased water, and plan for future droughts.

### **Specific Comments**

5. Section 1.4, Data Analysis and Limitations: The report uses recent data (2008-2011) to project future use, while acknowledging that the 2008-2011 time frame was a period of lower site activity due to the economic downturn and reduced commercial need for concrete. California is the second-leading state in the production of portland cement (California Geological Survey, 2009), and future needs are likely to be higher than the 2008-2011 recessionary levels. With the 2010 closure of CEMEX (Santa Cruz County), there may be more need for cement from Lehigh Cupertino in the future. Estimated future use calculations in the report should be revised to project non-recessionary estimates.

6. Sect. 5.5, Rock Plants 1 and 2, Quarry and Primary Crusher: This section indicates that an ultrasonic Doppler flowmeter was used to estimate flow rates for water usage from the 0.5 Mgal tank. Ultrasonic flow meters are commonly used in the wastewater industry, but the technology requires a minimum particulate level to be effective. Water from the 0.5 Mgal tank may be too low in particulates (i.e., too clean) for ultrasonic measurement methods, as suggested by section 5.5 of the report, which indicates that a flow rate for the Quarry line could not be determined. If flow rates related to the 0.5 Mgal tank are a critical part of the water balance study, it may be necessary for Lehigh to install flow meters on a temporary or permanent basis.

7. Sect. 5.5, Rock Plants 1 and 2, Quarry and Primary Crusher: Water usage associated with the 0.5 Mgal tank is not well documented. Water flow from the tank is not metered, and water lines from the tank branch off for multiple uses within the facility. Some of the water from the 0.5 Mgal tank eventually discharges to Permanente Creek, but there is insufficient information (and inadequate flow monitoring throughout the Lehigh system) to determine how much municipal water is discharged to Permanente Creek. Additionally, the text description in Section 5.5 is inconsistent with the schematic in Figure 8-1, in that it does not show the branch lines indicated in the text.

8. Section 5.5, Rock Plants 1 and 2, Quarry and Primary Crusher: This section indicates that Quarry office domestic water is consumed via a septic field. This text is potentially inconsistent with Sect. 5.6, Domestic Water, which indicates that water used in the facility's offices and employee workspace is routed to the wastewater treatment plant (WWTP).

9. Sect. 5.8, Quality Control Laboratory: This section indicates that wastewater from the laboratory is discharged to an adjoining septic system. The facility should ensure that the septic system is not used for the discharge of chemicals that may kill off the microorganisms in the septic system. All laboratory waste must be disposed in accordance with local, state, and federal regulations.

10. Sect. 6.2, Water Reclaim Tank A: This section indicates that a subsurface vault near Water Reclaim Tank A has an overflow pipe that discharges reclaim water to Permanente Creek during "substantial storms." A "substantial storm" is not defined in the text, and the frequency (events/year) of such "emergency situations" is also not defined. As part of the facility's overall stormwater management system, the capacity of this (and other) "emergency" bypass structures should be evaluated to determine if they are adequately sized.

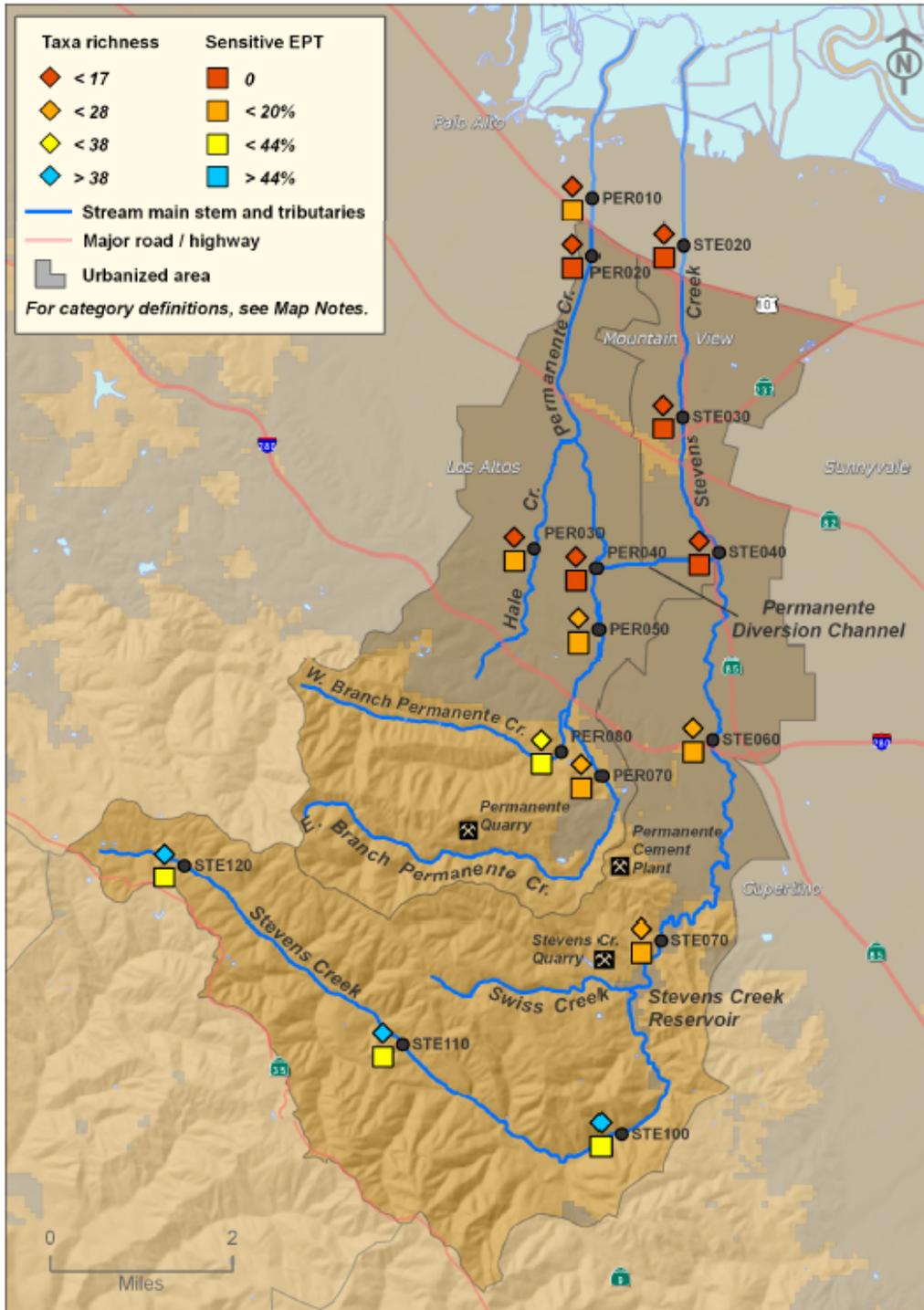
11. Section 7.2.1, TR-55 Stormwater Modeling: This section indicates that TR-55 (Natural Resources Conservation Service public domain watershed hydrology model) was run to simulate runoff volume. The model input parameters and results of the modelling should be summarized and documented in a table and output hydrographs. Input parameters for TR-55 include rainfall distribution type, hydrograph type, the weighted curve number (CN), time of concentration (Tc), acreage of the area and sub-areas, and county-specific rainfall data.

12. Figure 7-2 and 7-3: Stormwater Flow Paths: Some of the directional arrows indicating stormwater flow direction are incorrect, as they show stormwater flowing uphill. These figures should be corrected. It appears this figure was generated in a computer aided design (CAD) program; given the complex topography at the Lehigh site, it may be more appropriate to use a geographic information system (GIS) with topographic tools that can accurately map out stormwater flow directions, or, if available, a CAD program with an integrated digital elevation model (DEM) and software tools to map stormwater flow direction.

13. Figure 6-1, Reclaim Water System and Stormwater Infrastructure: This map (or an additional map if needed) should indicate hardscape (concrete, asphalt) type and extent within the operations area of the facility.

14. Figure 8-1, Water Balance Schematic: This figure is inconsistent with the report text and insufficiently detailed to document water balance for the facility. Sect. 5.5 of the text indicates that Quarry office wastewater is discharged to a septic field, but the septic field is not shown in Figure 8-1. Water lines from the 0.5 Mgal tank branch off into multiple lines with multiple uses which are not shown in Figure 8-1. Showing the water balance graphically is encouraged, but Figure 8-1 is inaccurate and incomplete and should be revised.

### Attachment B: SWAMP Monitoring Locations



SWAMP Monitoring Locations

**Attachment C: Lehigh Sample Location Maps**



**Lehigh Sample Locations**

- Receiving Water Sample
- Sand and Gravel Discharge Point
- Instream Pond Sampling Point
- Upstream Sample
- Downstream Sample

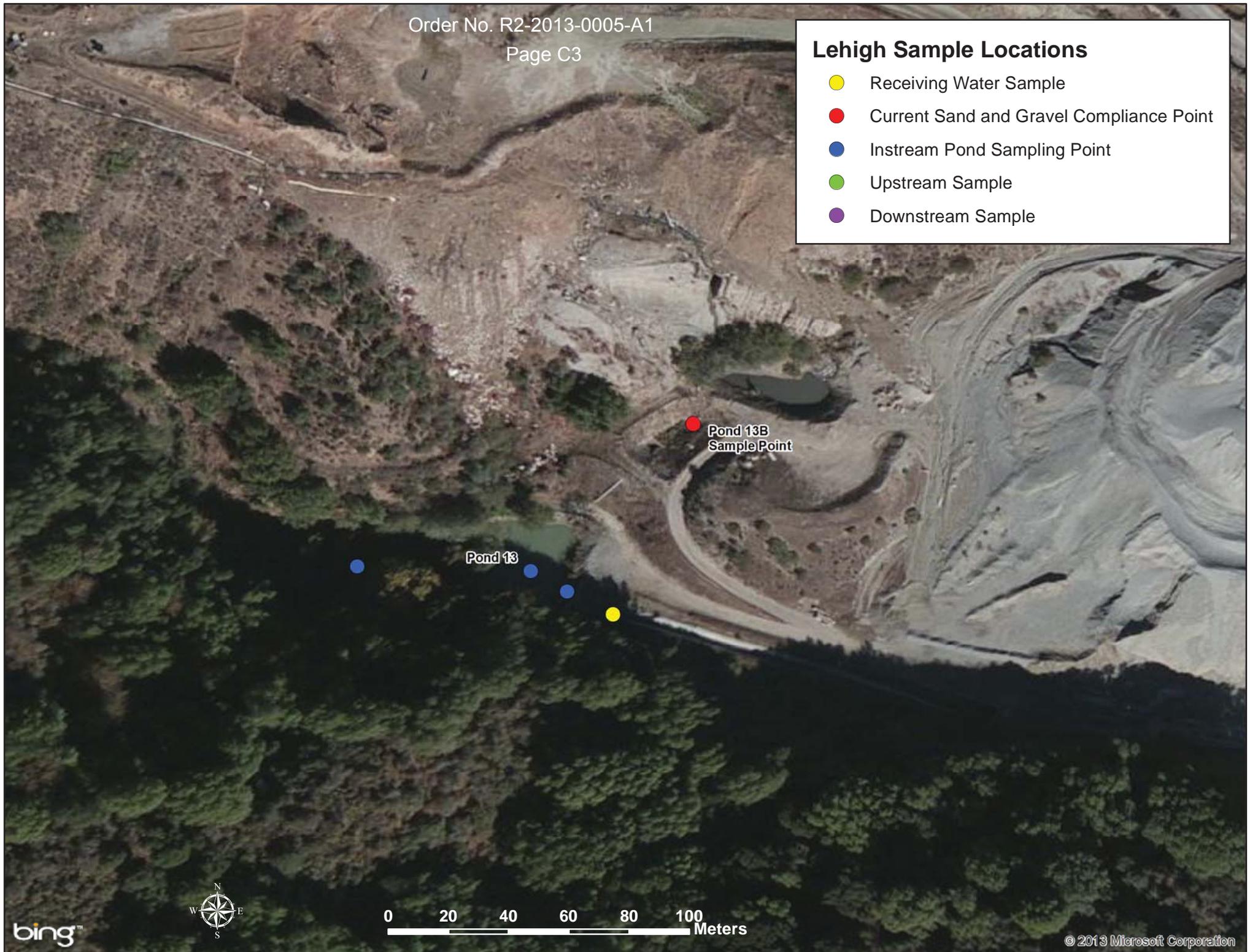


**Lehigh Sample Locations**

- Receiving Water Sample
- Sand and Gravel Discharge Point
- Instream Pond Sampling Point
- Upstream Sample
- Downstream Sample

### Lehigh Sample Locations

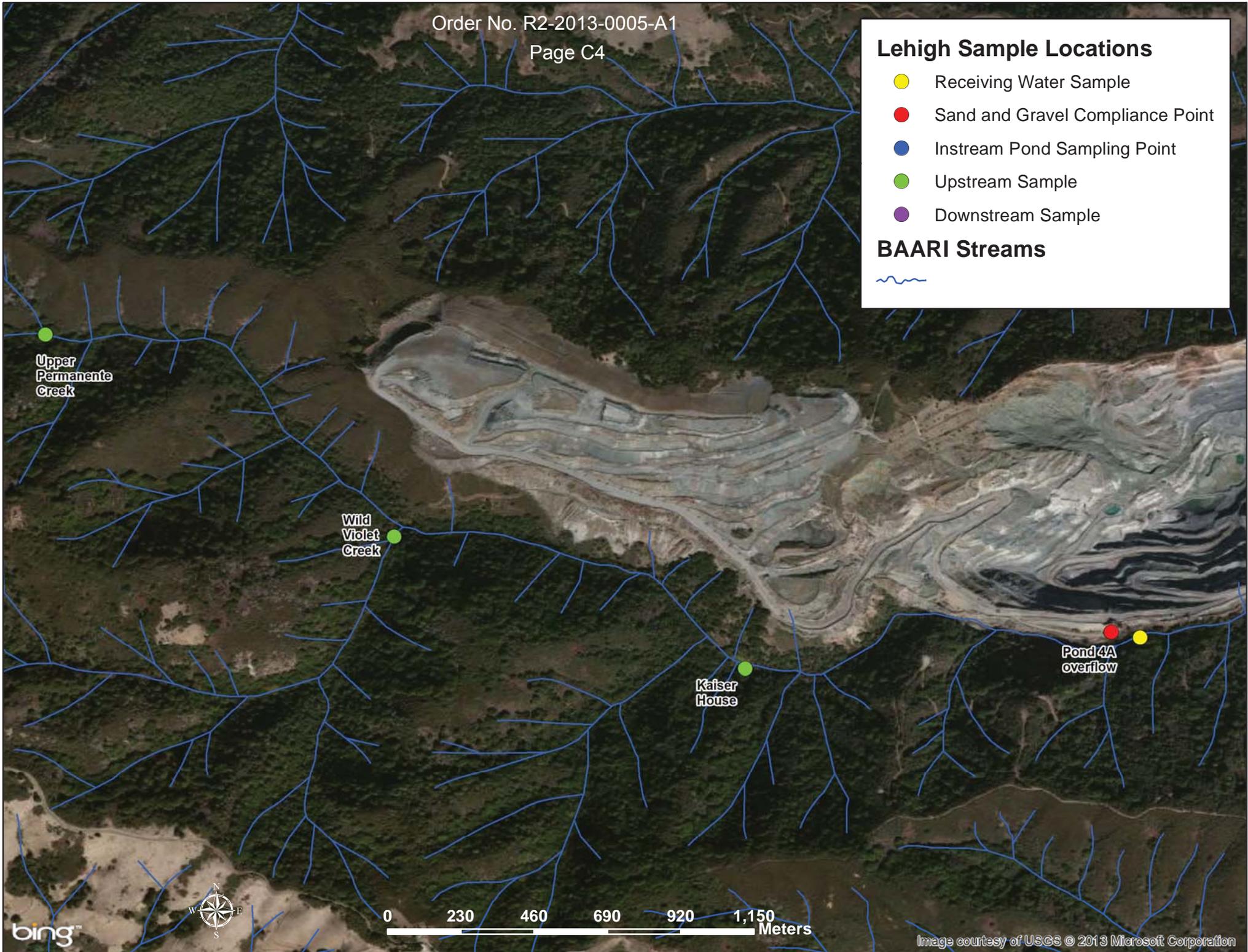
- Receiving Water Sample
- Current Sand and Gravel Compliance Point
- Instream Pond Sampling Point
- Upstream Sample
- Downstream Sample



### Lehigh Sample Locations

- Receiving Water Sample
- Sand and Gravel Compliance Point
- Instream Pond Sampling Point
- Upstream Sample
- Downstream Sample

### BAARI Streams



Upper  
Permanente  
Creek

Wild  
Violet  
Creek

Kaiser  
House

Pond 4A  
overflow

