

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER R5-2012-0010

WASTE DISCHARGE REQUIREMENTS
FOR
HOMESTAKE MINING COMPANY OF CALIFORNIA

FOR
CLOSURE AND POST-CLOSURE MAINTENANCE OF
McLAUGHLIN MINE
LAKE, NAPA AND YOLO COUNTIES

The Central Valley Regional Water Quality Control Board (“Central Valley Water Board” or “Board”) finds that:

1. Homestake Mining Company of California (hereafter “Discharger”) owns and operates McLaughlin Mine, a former gold mine (the “Facility”). The Facility was previously regulated by Waste Discharge Requirements (“WDRs”) Order R5-01-168 in conformance with Mining Waste Management Regulations found in California Code of Regulations, title 27 (“Title 27”). The Discharger submitted a Report of Waste Discharge on 9 March 2011 requesting revised WDRs for Closure and post-Closure Maintenance.
2. The Facility is now part of the Donald and Sylvia McLaughlin Natural Reserve (the “Reserve”), a relatively contiguous block of 6,430 acres. The Reserve is owned jointly by the Discharger and the University of California, Davis. The Discharger will continue to own and be responsible for the approximately 1,200 acres disturbed by mining within the Reserve. UC Davis is responsible for managing the remaining portion of the Reserve.
3. The mine site is located at the junction of Lake, Napa and Yolo Counties, as shown on Attachment A, a part of this Order. Waste rock and mill tailings waste containment facilities including the former mine pits are located in Sections 20, 29, 35 and 36 T12N, R5W; Sections 1, 2, 11 and 12 T11N, R5W; and Section 6 T11N, R6W.
4. Active mining and milling of ore ceased in 2002. Most of the mine infrastructure has been removed and the surrounding surface areas graded to approximate a natural surface, re-soiled and planted with native vegetation. The former office and shop complex near the Tailings Impoundment Facility (“TIF”) remains intact for use by the Homestake closure/site maintenance and UC Davis staffs. These WDRs address the Closure and post-Closure Maintenance of the following mine waste containment facilities: North and South mine pits (“MPs”), East and West Waste Rock Facilities (“WRFs”), and the TIF, as shown in Attachments B and C, a part of this Order. Table I summarizes the waste containment units:

TABLE I
Mine Waste Containment Unit Description

Unit	Title 27 Class	Volume	Description of Liner and Cover Components	Status
East Waste Rock Facility	Group B	13 Million Tons (MT) of waste rock on 62 acres	5-feet of non-acid forming clayey waste on prepared sub-grade and spine drains. Leachate is pumped to South MP. The final cover consists of ten to fifteen-feet of clay overlain by five to ten-feet of vegetated soil cover.	Filled and closed.
West Waste Rock Facility	Group B	80 MT of waste rock on 350 acres	5-feet of non-acid forming clayey waste on prepared sub-grade and spine drains. Leachate is pumped to South MP. The final cover consists of ten to fifteen-feet of clay overlain by five to ten-feet of vegetated soil cover.	Filled and closed.
North Mine Pit	Group B	14.6 MT including 4.6 MT tons in the WRF, 5.4 MT below 1700 ft and 4.6 MT as fill.	Unlined, base of waste is below the water table, any leachate is contained within the mine pit lake. The WRF final waste rock cover consists of fifteen-feet of non-acid generating clay overlain by five-feet of vegetated soil cover. Waste rock used as fill is not covered.	Filled and closed.
South Mine Pit	Group B	7 MT, including 3.3 MT in the WRF, 3.5 MT in below 1700 ft and 0.2 MT as fill	Unlined, base of waste is below the water table, any leachate is contained within the mine pit lake. The South MP WRF final waste rock cover consists of fifteen-feet of non-acid generating clay overlain by five-feet of vegetated soil cover. Waste rock used as fill is not covered.	Filled and closed.
Tailings Impoundment Facility	Group B	38 Million tons of mill tailings on 400 acres.	Unlined, 155 foot high clay cored impoundment dam keyed into bedrock, drainage blanket downstream of dam core. Cover shall consist of 320 acres with 1 to 2 feet of soil and a fluctuating pond up to 80 acres.	Filled and closing.

5. Davis Creek Reservoir, a flood control reservoir constructed and used by the mine operation also remains. The reservoir is not a waste containment unit and therefore, is not addressed by these WDRs.

WASTE AND SITE CLASSIFICATION

6. The Discharger discharged mine waste rock to the MPs and the WRFs, and discharged mill tailings to the TIF. On 6 May 1996, the Board issued Order 94-315, in which tailings waste from the mill and waste rock from the mine were classified as Group B mining wastes as currently defined in Section 22480(b)(2)(B) of Title 27. The waste rock and tailings contain non-hazardous concentrations of soluble pollutants including: TDS, sulfate, sodium, arsenic, nickel, boron, copper and zinc. The concentrations of these soluble pollutants exceed water quality objectives and could cause degradation of waters of the state. These WDRs continue that classification.
7. The Discharger filed an application with the California Department of Health Services ("DHS") to determine whether the tailings were or were not hazardous waste. On 27 March 1984, DHS classified the waste tailings as non-hazardous waste.
8. Leachate is collected at the base of the WRFs and pumped to the MPs for disposal. WRF leachate contains concentrations greater than background of TDS, sulfate, arsenic, copper, iron, nickel and zinc. The concentrations of these soluble pollutants exceed water quality objectives and could cause pollution of waters of the state. These WDRs classify the WRF leachate a Group B mining waste.
9. The North and South MPs are filling with inflowing groundwater, storm water and leachate from the WRFs. Besides the leachate constituents from the WRF leachate described in Finding 8, the pit water leaches soluble constituents (metals and salts) from mine wall rocks and waste rock stored in the pits.
10. The North and South MPs, the East and West WRFs and the TIF were constructed without liners and Leachate Collection and Removal Systems ("LCRSs"). Section 22470(c) of Title 27 provides that the Central Valley Water Board may grant exemptions from the requirements to construct liners and LCRSs at mining waste management units if a mining waste management unit meets specific criteria. Section 22470(c) states in part:

“(c) Exemptions Based On No/Little/Poor G.W. -The RWQCB can exempt a Group A or B (see s22480 of this article) Mining Unit from certain provisions of this article if a comprehensive hydrogeologic investigation demonstrates that:

- (1) there are only very minor amounts of groundwater underlying the area; or*
- (2) the discharge is in compliance with the applicable water quality control plan; and*
- (3) either natural conditions or containment structures will prevent lateral hydraulic interconnection with natural geologic materials containing ground water suitable for agricultural, domestic, or municipal beneficial uses. There is no detectable vertical hydraulic interconnection*

between the natural geologic materials underlying the Unit and natural geologic materials containing such ground water. If the above demonstration is acceptable to the RWQCB, the discharger can be exempted from requirements for liners and leachate collection and removal systems (see §22490 of this article). However, the discharger shall comply with the requirements of this article relative to siting, precipitation and drainage controls, and surface water quality monitoring. Closure and post-closure maintenance periods shall be designed to protect surface water quality. Ground water monitoring, and unsaturated zone monitoring as feasible, shall be conducted during the active life, closure, and post-closure maintenance period to verify that the Unit is not affecting ground water suitable for agricultural, domestic, or municipal beneficial uses.”

The Board previously granted exemptions for the MPs, for the East and West WRFs, and for the TIF from the requirements for liners and LCRSs under California Code of Regulations, title 23, chapter 15, section 2570(c). Chapter 15 was the predecessor to Title 27; Section 22470(c) contains identical language.

11. The mine pits are located in the inactive Stony Creek fault zone, a part of the Northern Coast Range Geologic Province. Principal rock types include Jurassic ophiolite structurally overlain by Jurassic/Cretaceous marine sedimentary rocks. The limited groundwater in the region is controlled by fracture flow. Measured hydraulic conductivity in wells screened below 70 feet at the TIF averages approximately 2×10^{-7} cm/sec.
12. The nearest known potentially active fault is approximately 2.5 miles east of the tailings disposal facility and approximately 0.5 miles west of the West WRFs. The maximum credible acceleration for the TIF is 0.7g.
13. Land uses within 1,000 feet of the facility are habitat reserve, recreation, research and stock grazing.
14. The facility receives an average of 33.5 inches of precipitation per year as measured at the TIF. The mean pan evaporation is 48 inches per year as estimated from measurements at the Lake Berryessa and Clear Lake Stations.
15. The 100-year, 24-hour precipitation event is estimated to be 7.67 inches, based on Department of Water Resources' bulletin entitled *Rainfall Depth-Duration-Frequency for California*, revised November 1982, updated August 1986.
16. The WRFs and the MPs are not within a 100-year flood plain based on calculations presented in a private report entitled: "McLaughlin Project-Proposed Gold Mine and Mineral Extraction: Environmental Report," 1982. The TIF is located within a small broad valley, tributary to Hunting Creek. The TIF is protected from flood damage with a storm water interception ditch system designed to handle the 1000-year, 24-hour flood event.

SURFACE AND GROUND WATER CONDITIONS

17. The *Water Quality Control Plan for the Sacramento River and San Joaquin River Basins*, Fourth Edition, revised September 2009 (the "Basin Plan"), designates beneficial uses, establishes water quality objectives, and contains implementation plans and policies for all waters of the Basin. The designated beneficial uses of groundwater beneath the facility are municipal and domestic supply, agricultural supply, industrial service supply and industrial process supply. The mine is located in mountainous terrain, the MPs straddle the crest of a ridge, the WRFs are located on the western slopes and the TIF occupies a small drainage five miles to the northwest. Surface drainage from the TIF, the WRFs and western parts of the MPs is to the west toward Hunting Creek in the Upper Putah Creek Hydrologic Area (512.30). Hunting Creek drains south to Putah Creek and Lake Berryessa. Surface drainage from areas east of the mine pits is toward Davis Creek in the Rumsey Hydrologic Area (513.31). Davis Creek drains to Cache Creek below Clear Lake. All surface drainage is in the Sacramento River Basin.
18. Shallow groundwater occurs in alluvial deposits, volcanics and other fractured surficial deposits. At depth little groundwater is present with localized pockets of relatively high permeability material surrounded by impermeable material. Groundwater levels in near surface units generally follow the topography with recharge occurring along topographic highs and discharge occurring within stream valleys. Groundwater elevations range from 1140 feet MSL to 2280 feet MSL. Shallow groundwater is unconfined, and deep groundwater is highly confined. Depth to shallow groundwater may fluctuate seasonally as much as 25 feet.
19. Groundwater flow is controlled by the fracture system and otherwise generally conforms to local topography. Groundwater flow directions and gradients are highly variable.
20. The Discharger determined through a comprehensive hydrogeologic investigation that there are only very minor amounts of groundwater and the chemical quality of ground and surface waters in the immediate vicinity of the MPs, East and West WRFs, and the TIF is generally poor. Little ground water has been found underlying the waste rock and tailings areas due to the low permeability of the bedrock. In the mine pit area, a deeper aquifer occurs primarily in fractured basalt dikes which are limited to the immediate vicinity of the mine pit. This deep aquifer is of poor quality due to its geothermal nature. In this aquifer, TDS ranges from 1,000 to 5,000 mg/l. Sulfate averages about 400 mg/l and chloride ranges from 20 to 1,600 mg/l. Boron averages about 100 mg/l near the south end of the mine pit and about 3 mg/l near the north end.
21. There is one groundwater well used to supply the sanitary system. The local groundwater is not suitable for drinking water supply. There are no other active municipal, domestic, industrial, and/or agricultural groundwater supply wells within one mile of the site. There are no residences within 1000 feet of the facility.

GROUNDWATER, UNSATURATED ZONE, AND SURFACE WATER MONITORING

22. The groundwater monitoring system includes eleven monitoring wells: for the mine pit area S-01 and S-02B; for the waste rock facilities S-05 and S-06; and for the tailings impoundment facility N-1, N-2A, N-5, N-8A N-8B, N-8C and N-12.

23. The Discharger's detection monitoring program for groundwater at the Unit(s) satisfies the requirements contained in Title 27.
24. Water quality in surface water bodies draining the mine area is sampled at the following locations: HC-09, HC-10, and KC-03. Springs or seeps down gradient of the mine area are sampled at the following locations: 1420BS, 1550KS, 1560KS, 1600 SEEP, 1400KA (adit), 1550KA (adit), 1680DS, and 1590DS.
25. The Discharger's detection monitoring program for surface water satisfies the requirements contained in Title 27.

DESIGN OF WASTE MANAGEMENT UNIT(S)

26. Title 27, section 22510(j) requires that: *"new and existing Group A and B waste piles shall be closed in accordance with the provisions of Section 21090(a-c)"*. Section 21090(a-c) specifies the Closure and Post-Closure Maintenance Requirements of Solid Waste Landfills.
27. Title 27, section 20080(b) allows the Board to consider approval of an engineered alternative to the prescriptive standard. In order to approve an engineered alternative in accordance with Title 27, section 20080(c)(1) and (2), the Discharger must demonstrate that the prescriptive design is unreasonably and unnecessarily burdensome and will cost substantially more than an alternative which will meet the criteria contained in Title 27, section 20080(b), or would be impractical and would not promote attainment of applicable performance standards. In connection with these provisions, the Discharger must demonstrate that the proposed engineered alternative cover system is consistent with the performance goal addressed by the particular prescriptive standard, and provides protection against water quality impairment equivalent to the prescriptive standard in accordance with Title 27, section 20080(b)(2).

East and West Waste Rock Facilities

28. The Discharger constructed the East and West WRFs to contain waste rock generated by mining. The West WRF contains approximately 80-million tons of waste rock on 350 acres. The East WRF contains approximately 13-million tons of waste rock on 62 acres.
29. McLaughlin Mine Waste consists of both acid forming and non-acid forming rock types. The Discharger has minimized the potential for production of acid mining drainage ("AMD") by encapsulating acid forming waste within non-acid forming waste.
30. The waste rock cells at the East and West WRFs were constructed by clearing and grubbing an area; constructing a base layer of not less than five feet of non-acid forming clayey waste; and placing acid-forming waste rock in 50-foot lifts. Between lifts, acid-forming waste layers are separated by compacted (haul truck wheel rolled) clayey non-acid producing waste layers not less than five feet thick. Outer surfaces are covered with a minimum of twenty feet of final cover consisting of not less than ten feet and in most cases fifteen feet of low permeability clay overlain by five to ten feet of vegetated soil.

31. Overall slopes ratios are 3 horizontal (h):1 vertical (v) (bench faces are 2.5(h):1(v)) with 150 foot wide benches at 100-foot vertical intervals. The waste rock disposal facilities are designed to withstand the seismic loads resulting from the Maximum Probable Earthquake (Title 27, Section 20370(a)).
32. Rock under-drains were constructed at low points in the original topography and at known natural seeps. The under drain system collects leachate and spring water and the system discharges to sumps for pump-back to the South MP Lake. This system prevents leachate discharge to Hunting Creek. Collection sumps S-11 and S-12 are located at the West WRF; collection sump S-13 is located at East WRF. This collection and pump back system will need to be operated as long as leachate is generated from the East and West WRFs.
33. Collection sump S-11 collects leachate in a 150,500 gallon tank with secondary containment capacity of 205,150 gallons and a pump-back capacity of 600 gpm. Sump S-12 has a 66,100 gallon tank with a secondary containment capacity of 88,880 gallons and a pump capacity of 680 gpm. S-13 has a 40,000 gallon tank and a pump capacity of 750 gpm.
34. The East and West WRFs have recurring small scale slope failures and erosion problems associated with heavy rain events, apparently due to constructed methods and the fine grained nature of cover soils. This will require periodic maintenance. The maintenance of the waste rock facilities will require regular monitoring and upkeep of the slope.
35. Closure of the East and West WRFs was not pre-approved as an engineered alternative by the Board. Subsequently, in compliance with the requirements of WDRs Order No. 5-01-168, the Discharger submitted a report (August 2002) assessing the permeability of the waste rock covers. Based on testing of the in-place covers, the report concluded that cover thickness exceeded and hydraulic conductivity is equivalent or lower than the Title 27 prescriptive standard cover for a Group B mining waste.
36. Cover slopes have a maximum slope ratio of 2.5(h):1(v) and passed seismic stability analysis in compliance with Title 27, sections 21090(a) and 21750(f)(5). However, the distances between benches, 100 vertical feet, exceeds the prescriptive standard 50 vertical feet. Title 27, section 21090(a) states: *"the RWQCB can allow any alternative final cover design that it finds will continue to isolate the waste in the Unit from precipitation and irrigation waters at least as well as would a final cover built in accordance with applicable prescriptive standards"*. Therefore, because the Discharger's analysis concludes that continued maintenance of the final covers at East and West WRFs will isolate the wastes from precipitation at least as well as a prescriptive cover, these units meet the requirements for an engineered alternative to the final cover requirements of Title 27, section 21090(a).

North and South Mine Pits

37. The McLaughlin Mine excavated gold ore from two adjacent open mine pits, the South Pit and the North MP. The South MP and North MP were mined to floor elevations of approximately

1270 feet above mean sea level ("MSL") and 1480 feet MSL respectively. The South MP Lake and North MP Lake have approximate surface footprints of 52 acres and 12 acres respectively. Pit high walls remain as they were originally excavated, the geologic strong east highwall averages 45 degree slopes, the weaker west highwall was constructed with a flatter slope averaging 25 degrees. The mine pit walls will weather over time and may undergo mass wasting. Any effects of mass wasting will be contained within the MPs.

38. Subsequent to active mining, dewatering wells were removed and the mine pits filled with water forming the North MP and South MP Lakes. The pre-mining groundwater elevation in the area of the mine pits was approximately 1800 feet MSL. Without active management, static water level in the mine pits would presumably return to the pre-mining static groundwater level.
39. The Discharger submitted the following reports concerning water balance and water level management of the mine pit lakes: "McLaughlin Mine Pit Lake Water Balance and Water Quality Work Plan" 2006, "Update to the Pit Water Management Plan" 2008 and "Evaluation of North Pit Water Level and Discharge Conditions" 2010. These WDRs are based on information in the three reports and on supporting information submitted in response to staff inquiries.
40. Storm water is diverted away from the mine pits by a system of drainage channels. The storm water control system is designed to convey runoff from a 100-year, 24-hour storm event. Water flows reporting to the mine pit lakes include direct precipitation, pit wall runoff, groundwater inflow and leachate pumped to the South MP, from the East and West WRFs.
41. Water quality in the mine pits is generally poor. The September 2010 sampling event detected the following concentrations: TDS – 10,000 mg/L, Sulfate – 9200 mg/L, Zinc – 2200 ug/L and Nickel – 17,000 ug/L. The South MP has higher concentrations of copper, chloride, lead and manganese than the North MP. The North MP has stronger vertical stratification with very low oxygen concentrations at depth, lower pH and warmer temperatures. These differences suggest that North MP chemistry may be influenced by interaction with geothermal springs at depth.
42. The mine pits are connected to local groundwater flow and act as local groundwater sinks. If water levels in the mine pits are maintained below local static groundwater elevation, pit water likely will not discharge to groundwater. The Discharger will manage water levels to maintain the pits as hydraulic sinks. This maintenance of pit water level will likely continue for a significant period of time.
43. There is a potential for surface water discharge through the northwest side of North MP Lake. The bedrock low point occurs on the northwest of perimeter of North MP. The bedrock low point is penetrated by an abandoned culvert with a trench bottom elevation of approximately 1718 feet MSL. Therefore, under current conditions if the pit lake water elevations exceed 1718 feet for a sustained period of time, a surface water discharge could occur. The Discharger has sealed the culvert and proposes to construct a cut-off trench that will raise the current North MP bedrock lip (pit low point) from its approximate current elevation of 1718 feet MSL to an elevation of 1730 feet MSL.

44. The mine pit lakes are very large and there is a potential for a large scale discharge event that may be impossible to contain without providing substantial available capacity. Therefore, these WDRs require the Discharger to maintain ten-feet of freeboard in the North MP. These WDRs require North MP Lake water levels shall not exceed elevation 1708 feet MSL. If the Discharger demonstrates that the proposed cutoff trench and sealed culvert will not leak under prolonged saturation, staff may propose an amendment to the WDRs to revise the maximum mine pit water level.
45. The Discharger uses enhanced evaporation to control lake levels in North MP, which causes the South MP lake levels to be higher. The low point that divides the two mine pits is at an elevation of 1730 feet MSL. If the South Pit Lake water level exceeds 1730 feet MSL, it potentially could flood the North Pit Lake and result in a surface water discharge. Therefore, these WDRs require that the South MP Lake levels shall not exceed 1726 feet MSL to prevent any overflow of pit water from the South MP to the North MP.

Waste Rock Units in the Mine Pits

46. Mine waste rock was placed in the North and South MPs in engineered containment units and as fill in the construction of ramps and other structures. The North MP contains approximately 14.6 MT and the South MP contains approximately 7 MT of waste rock. Backfill slopes are 2.5(h):1(v) or less.
47. Previous Board-issued Orders classified McLaughlin Mine waste rock as Group B mining waste (Finding No. 6) and exempted the MPs from requirements for liners and LCRSs (Finding No. 10).
48. McLaughlin Mine waste rock consists of both acid forming and non-acid forming types. Below elevation 1700 feet MSL, acid forming and non-acid forming wastes were emplaced randomly because they will remain underwater and will not be exposed to oxidation that produces Acid Mine Drainage (AMD). Above 1700 feet MSL, the Discharger protected against AMD by encapsulating acid forming waste within non-acid forming waste. The encapsulation process consists of placing fifty-foot thick lifts of acid forming waste separated by five foot thick layers of compacted non-acid forming clayey waste. The waste cells were covered with a twenty foot thick final cover composed of not less than fifteen feet of non-acid generating clay overlain by five feet of soil. In the North MP 5.4 MT were placed below 1700 feet, 4.6 MT were encapsulated above 1700 feet and 4.6 MT of non-acid generating waste were used to construct mining related structures; in South MP 3.5 MT were placed below 1700 feet, 3.3 MT were encapsulated above 1700 feet and 0.2 MT non-acid generating waste were used to construct mining related structures.
49. Under-drains were not installed for the mine pit back fills, waste cells are located so that leachate drains into and is contained by the pit lakes.
50. Closure of the North and South MP waste rock cells was not pre-approved as an engineered alternative by the Board. Subsequently, in compliance with the requirements of WDRs Order No. 5-01-168, the Discharger submitted a report (August 2002) assessing the permeability of

the covers at all the waste rock containment units. Based on testing of the in-place covers, the report concluded that cover thickness exceeded and hydraulic conductivity is equivalent or lower than the Title 27 prescriptive standard cover for a Group B mining waste.

Tailings Impoundment Facility

51. The TIF consists of a 155-foot high earthfill dam that blocks a small dry valley. The impoundment contains 38 million tons of tailings on approximately 400 acres. The maximum depth of tailings is approximately 145 feet. The dam is constructed with a clay core that is keyed into bedrock and a sand seepage collection blanket downstream of the clay core. Two drainage systems at the base of the dam collect seepage from the chimney drain, the blanket drain and from springs in the dam foundation. Collected liquids are pumped back to the TIF.
52. Perimeter diversion channels isolate the TIF from storm water run on. Groundwater monitoring wells are located downgradient from the embankment to detect seepage. To date, the approved monitoring program has not detected evidence of a release from the TIF to groundwater or surface water.
53. The TIF embankment dam is regulated by the California Department of Water Resources, Division of Safety of Dams ("DSD"). DSD reviews and accepts dam design and construction documents and inspects all dam structures periodically. DSD has certified the TIF dam is designed and constructed in a manner that protects downstream life and property.
54. The tailings are silt-sized rock particles discharged as a slurry from spigots at the perimeter of the TIF. The discharge technique resulted in coarser material at the perimeter and finer tailings near the center of the TIF.
55. In 1983, before the start of active mining, the Discharger submitted the initial Reclamation Plan that included closure of the TIF. The plan for the TIF anticipated grading the top deck to drain; breaching the dam to allow storm water runoff; installing a soil cover consisting of a capillary barrier, two feet of crushed waste rock and one to two feet of soil; and establish a vegetation cover. The Reclamation Plan was reviewed by the Board and approved by Lake County.
56. The TIF ceased operations in July 2002, when ore processing was complete. Before the end of operations, in October 2001, the Discharger submitted the "*Homestake Mining Company, McLaughlin Mine, Closure Plan*" proposing a revised closure plan. The Discharger justified a revised approach to closure because actual physical conditions of the tailings are different than assumed conditions in the preliminary plan. The revised plan proposed to cover the TIF with nominal six-inch soil cover emplaced by hydraulic methods (no compaction and no coverage control), allow natural re-vegetation, leave a leachate pond and promise to maintain the dam.
57. The Discharger has demonstrated that the initial Reclamation and Closure Plan for the TIF is infeasible because the physical conditions of the tailings do not provide a stable surface to construct a final cover and the preliminary plan creates a drainage structure that could allow a tailings release in case of a seismic event. Because natural springs discharge into the base of the tailings impoundment the tailings will never de-water sufficiently to support a conventional

cover. Staff rejected the Discharger's original revised plan because it did not adequately protect water quality and asked for a feasibility study to evaluate closure alternatives.

58. Between 2002 and 2008 the Discharger completed a number of investigations to determine the best methods for closing the TIF. The *"Feasibility Study of Closure Alternatives for McLaughlin Mine Tailings Impoundment"* (2007) concluded that the best alternative consists of a vegetated soil cover over areas underlain by thin tailings deposits, and a permanent/seasonal water pool over areas underlain by thicker tailings (the middle of the impoundment). The covered areas will utilize an interconnecting system of berms to retain fresh storm water and develop local marsh – upland plant communities. The embankment dam will be maintained and run-on storm water will be diverted around the TIF with a system of ditches.
59. Under Title 27, section 20080(b), if a prescriptive standard is infeasible, an engineered alternative may be approved provided: 1) it is consistent with the specific performance goal addressed by the particular prescriptive standard; and 2) it affords equivalent protection against water impairment.
60. The closure Performance Standard for mining units (Title 27, § 22510(a).) is the units "...shall be closed so that they no longer pose a threat to water quality." The prescriptive standard for closure for tailings facility is described in Title 27, section 22510(l) which includes a low-permeable cover described in Title 27, sections 21090(a) – (c) and drainage of the tailing as required in Title 27, section 21400(a). A prescriptive standard closure is not possible at this site, and the discharger proposes to contain solid and liquid wastes by maintaining the embankment dam and retaining leachate and contact water within the footprint of the TIF. This has been the approach throughout the active life of the project and the Discharger proposes to maintain this system throughout closure. Monitoring over the life of the project demonstrates that the TIF does not discharge to groundwater. The Discharger believes that so long as the structural integrity of the dam and the run-on interception and removal system are maintained the proposed closure system will protect water quality and achieve closure Performance Standard.
61. In October 2008, the Discharger submitted the *"Final Closure and Postclosure Maintenance Plan for McLaughlin Mine Tailings Impoundment Facility."* These WDRs are based on that plan and on supporting documents covering maintenance of the Mine Pit Lakes and the Waste Rock Facilities. The proposed final TIF closure will consist of placing a soil cover over areas with thin tailings deposits, approximately 320 acres. The remaining 80 acres of tailings, near the center of the impoundment and containing the thickest tailings, will not be covered, but will remain a low area with an internal pond. The internal pond will expand and contract seasonally and in response to long term weather patterns. The revised plan leaves the TIF embankment dam intact without a breach, and internal drainage. The cover will consist of one to two feet of compacted soil with a system of low earthen berms to catch and hold fresh storm water and to support native vegetation. The internal pond will be fed by storm water and leachate released by dewatering tailings. The upland covered parts of the tailings will evolve into a mixed wetlands/grasslands environment. The Discharger has demonstrated that the TIF can be maintained as a zero-discharge facility.

62. Planned improvements to the perimeter storm water diversion channel are designed for a 1,000-year, 24-hour storm.
63. Water quality in the internal pond is poor, the September 2009 sampling event detected the following concentrations: TDS - 7600 mg/L, Sulfate - 7500 mg/L, Arsenic - 320 ug/L and Copper - 130 ug/L. Over time water quality is expected to degrade through the process of evapo-concentration, one investigation projected TDS concentrations to increase to the saturation level (approximately 130,000 ppm).
64. This closure plan is viable only if the TIF embankment dam and run-on interception and removal system are maintained indefinitely.
65. The California Department of Fish and Game staff reviewed the revised closure plan and corresponding CEQA documents and stated in an email that *“the Project...is an improvement over the 1983 Plan and 2001 closure proposal from the perspective of wildlife habit, and will lead to an increase in biodiversity at the site. Additionally, the long-term monitoring of biological resources and water quality in place at the site will reduce risks to the health of wildlife utilizing the TIF.”*
66. Closure of the TIF will occur in phases due to its large size, the naturally slow dewatering and consolidation process and relatively large volume of impounded water. Placement of the soil cover can occur only during dry weather after the tailings have been exposed and dried for several weeks (most years a few weeks in late summer). The time required to complete closure will depend on tailings de-watering and weather conditions. The Discharger anticipates it will be complete within 10 to 15 years.
67. Construction will proceed only after all applicable construction quality assurance plans have been approved by the Executive Officer.

FINANCIAL ASSURANCES

68. The Discharger submitted Financial Assurance Estimates in 2011 to cover: the TMF closure costs (\$21,088,206); TMF Postclosure Operation and Maintenance for 40 years (\$16,552,582); East and West Waste Rock Facilities Postclosure Operation; and Maintenance for 40 years (\$7,415,690); and North and South MP and Pit WRFs Operation and Maintenance (\$5,921,480). The 2011 total for the site is \$50,977,958. The Operation and Maintenance estimates include costs for unusual but foreseeable events, including reasonably foreseeable releases. The cost estimates are based on 2011 prevailing labor rates and Caltrans equipment rates. The 40-year postclosure period is used to in effect provide annual maintenance in perpetuity (net interest on the total amount will cover annual maintenance costs). Staff concurs that the estimates are complete, conservative and professional and represent reasonable estimates of likely actual closure and postclosure maintenance costs to comply with this Order. The Financial Assurance estimates do not cover reclamation tasks pursuant to the Surface Mining and Reclamation Act of 1975 (SMARA) and the State Mining and Geology Board Regulations (California Code of Requirements (CCR) Title 14, Division 2, Chapter 8, Subchapter 1).

CEQA AND OTHER CONSIDERATIONS

69. The Lake County Community Development Department adopted a Mitigated Negative Declaration of environmental impact and approved the use permit modification and the TIF Reclamation Plan Amendment on 22 April 2010. The Board considered the negative declaration and incorporated mitigation measures from the negative declaration into these waste discharge requirements.

70. Water Code section 13267 states, in part:

(a) A regional board, in establishing or reviewing any water quality control plan or waste discharge requirements, or in connection with any action relating to any plan or requirement authorized by this division, may investigate the quality of any waters of the state within its region.

(b)(1) In conducting an investigation specified in subdivision (a), the regional board may require that any person who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge waste within its region, ... shall furnish, under penalty of perjury, technical or monitoring program reports which the regional board requires. The burden, including costs, of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports. In requiring those reports, the regional board shall provide the person with a written explanation with regard to the need for the reports, and shall identify the evidence that supports requiring that person to provide the reports.

The technical reports required by this Order and the attached Monitoring and Reporting Program are necessary to assure compliance with these waste discharge requirements, and to assure that the discharges will comply with the Basin Plan. The Discharger owns and operates the facility, and is responsible for the discharges of waste at the facility subject to this Order and is, therefore, subject to requirements imposed pursuant to Water Code section 13267.

PROCEDURAL REQUIREMENTS

71. All local agencies with jurisdiction to regulate land use, solid waste disposal, air pollution, and to protect public health have approved the use of this site for the discharges of waste to land stated herein.

72. The Board notified the Discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for this discharge, and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.

73. The Board, in a public meeting, heard and considered all comments pertaining to the discharge.

IT IS HEREBY ORDERED, pursuant to Water Code sections 13263 and 13267, that Order No. 5-01-168 is rescinded, and that the Homestake Mining Company of California, its agents, successors, and assigns, shall comply with the following:

A. PROHIBITIONS

1. This facility is closed; the discharge of any mining waste, hazardous waste, designated waste, municipal waste or inert waste at the Facility, other than pump-back liquids specifically

permitted by this Order and potential reclamation activities involving grading and stabilization of mine waste rock for the purposes of complying with SMARA, is prohibited. For the purposes of this Order, the terms 'hazardous waste' and 'designated waste' are as defined in Title 27.

2. The discharge of solid waste or liquid waste to surface waters or surface water drainage courses is prohibited.
3. The discharge of wastes outside of a waste management unit or portions of a waste management unit specifically designed for their containment is prohibited.

B. DISCHARGE SPECIFICATIONS

General Specifications

1. Pump-back liquids shall only be discharged into, and shall be confined to, the waste management units ("WMUs") specifically permitted for their containment.
2. Pump-back system pipes, valves and pumps shall be inspected and maintained regularly. Leaks or other identified issues shall be repaired or replaced in a timely manner.
3. Surface roads will be watered as needed to control or reduce dust.
4. The Discharger shall maintain site security through out the closure period. Perimeter fences, locked gates and signs shall be maintained to exclude public entry to the site. Locks, gates, signs and fences shall be inspected quarterly; damaged security features shall be repaired or replaced immediately.
5. Signs shall be repaired or replaced as needed to maintain their visibility. Vegetation that encroaches on or obscures signs shall be cut back or removed.

Protection from Storm Events

6. Waste management units shall be designed, constructed, operated and maintained to prevent inundation or washout due to flooding events with a 100-year return period.
7. Precipitation and drainage control systems shall be designed, constructed and maintained to accommodate the anticipated volume of precipitation and peak flows from surface runoff under 1,000-year, 24-hour precipitation conditions.
8. Annually, prior to the anticipated rainy season, any necessary erosion control measures shall be implemented, and any necessary construction, maintenance, or repairs of precipitation and drainage control facilities shall be completed to prevent erosion or flooding of the site.

Mine Pit Lakes

9. The Mine Pit Lakes and related containment structures shall be maintained to prevent, to the greatest extent possible, inundation, erosion, slope failure, washout, and overtopping under 1,000-year, 24-hour precipitation conditions, and shall be designed to contain the 100-year wet season precipitation.
10. Leachate generation by a WMU shall not exceed 85% of the design capacity of the collection sump. If leachate generation exceeds this value and/or if the depth of the fluid in a sump exceeds the maximum needed for safe pump operation, then the Discharger shall notify the Regional Board in writing within **seven days**. Notification shall include a timetable for a remedial action to repair the containment structures or other action necessary to prevent release of leachate.

C. RECEIVING WATER LIMITATIONS

Water Quality Protection Standards

The concentrations of Constituents of Concern in waters passing through the Points of Compliance shall not exceed the Concentration Limits established pursuant to Monitoring and Reporting Program R5-2012-0010, which is attached to and made part of this Order.

D. FINANCIAL ASSURANCE

1. The Discharger shall establish an irrevocable Letter of Credit in the amount of \$50,978,000, with the Central Valley Water Board as the named beneficiary, for TIF closure costs, for postclosure maintenance costs and corrective action costs for reasonably foreseeable releases at the TIF, the East and West Waste Rock Facilities, and the North and South Mine Pits for actions required herein. The issuing institution shall become liable under the terms of the Letter of Credit if the Executive Officer determines that the Discharger has failed or is failing to perform closure or postclosure maintenance or corrective action activities as guaranteed by the mechanism in a timely manner. Prior to any exercise of remedies, Regional Board staff will provide the Discharger with written notice of the Discharger's noncompliance with any provisions of these WDRs. The Discharger may cancel the letter of Credit only if alternate financial assurance is substituted as specified in Title 27, section 22227, or if the Discharger is released by the Central Valley Water Board from the requirement to maintain financial assurances.
2. **By April 30 each year**, the Discharger shall submit a report of financial assurances and shall annually adjust the financial assurances amount to account for inflation and any changes in facility design, construction, or operation.

E. PROVISIONS

1. The Discharger shall comply with all applicable provisions of Title 27 that are not specifically referred to in this Order.

2. The Discharger shall, in a timely manner, remove and relocate any wastes discharged at this facility in violation of this Order and of the Water Code.
3. The Discharger shall comply with the Standard Provisions and Reporting Requirements for Mining Wastes, dated February 2009, which are hereby incorporated into this Order. The Standard Provisions and Reporting Requirements contain important provisions and requirements with which the Discharger must comply. A violation of any of the Standard Provisions and Reporting Requirements is a violation of these waste discharge requirements.
4. The Discharger shall comply with Monitoring and Reporting Program R5-2012-0010, which is attached to and made part of this Order. This compliance includes, but is not limited to, maintenance of waste containment facilities and precipitation and drainage controls and monitoring groundwater, the unsaturated zone, and surface waters throughout the active life of the waste management units and the post-closure maintenance period. A violation of Monitoring and Reporting Program R5-2012-0010 is a violation of these waste discharge requirements.
5. Existing sampling points at leachate sumps S-11, S-12 and S-13 are difficult to sample and present health and safety concerns to personnel collecting samples. Therefore, the Discharger shall propose and develop if necessary alternative locations to collect grab samples of pump-back waters from the West Waste Rock Facility and the East Waste Rock Facility.
6. The Discharger shall maintain legible records of the volume of pump-back water discharged to the North MP, South MP and TIF Pond and the manner and location of the discharge. Such records shall be maintained at the Facility. These records shall be available for review by representatives of the Board and of the State Water Resources Control Board; the flow data shall be summarized and reported to the Central Valley Water Board in compliance with the Monitoring and Reporting Program.
7. Water Levels in the North MP Lake shall be maintained below 1708 feet MSL, Water Levels in the South MP Lake shall be maintained below 1726 feet MSL and South MP shall not overflow into North MP Lake. (Findings Nos. 43, 44 and 45).
8. The Discharger shall conduct annual water quality trend analysis for the TIF pond, the North MP and the South MP in compliance with Monitoring and Reporting Program R5-2012-0010. If trend analysis indicate that water quality is likely to exceed Group B Mining Waste criteria within three years, the Discharger shall submit, within 180 days, an evaluation of corrective actions to prevent concentrations from exceed Group B Mining Waste criteria. Any corrective action plan shall include an implementation schedule for proposed corrective actions and propose additional monitoring to evaluate success of the corrective actions.
9. The Discharger shall complete closure of the TIF by **31 December 2021**. The Discharger shall undertake to complete between 32 to 62 acres of soil cover per year depending on weather condition. If closure becomes infeasible by 31 December 2021, the Discharger shall submit a

report at least one year in advance of the closure date that describes the reason the closure cannot be completed and measures to close the unit as soon as possible. The report shall be submitted to the Executive Officer for concurrence.

10. Prior to starting TIF closure construction the Discharger shall submit detailed final closure documents and drawings for staff review and approval.
11. Until the TIF is closed, the Discharger shall submit annually by **30 July** a TIF Closure Progress Report. The report shall track closure progress; the location and extent of planned soil cover construction for the upcoming construction season. If the extent of proposed closure is less than 32 acres or the average annual closure completed to date is less than 32 acres, the Discharger shall identify the specific conditions preventing achievement of closure goals.
12. TIF areas previously covered with soil shall be inspected annually. If necessary supplemental erosion controls shall be implemented in previously covered areas to prevent exposed tailings. Supplemental erosion controls may include: 1) planting vegetation in areas where natural re-vegetation has not been successful; 2) installation of additional berms, water bars and/or drainage swales; and 3) installation of additional rip-rap or erosion matting.
13. During active construction, the Discharger shall submit weekly progress reports.
14. The Discharger shall inspect the TIF soil cover semi-annually for signs of settlement, subsidence, erosion, cracking, thin vegetation cover or other indications that the integrity or effectiveness has been impacted. Any issues requiring corrective action shall be reported to staff **within 7 days** and repaired as soon as feasible (before the next rainy season).
15. The Discharger shall inspect the TIF interior berms semi-annually for excessive settlement and erosion. Differential settlement greater than 15% of berm height or erosion that threatens the future usefulness of the berms is defined as excessive. Soil will be added to berms that settle excessively. Berm inlets and outlets shall be inspected to ensure they are functioning and draining properly.
16. Stormwater diversion channels shall be inspected semi-annually and following heavy precipitation events (greater than 1 inch of rainfall in 24-hours). Inspections shall note evidence of damage, excessive erosion, settlement, and obstruction by debris. Issues detected in the dry season shall be corrected before the rainy season. During the rainy season, damaged or obstructed drainage ditches shall be repaired as soon as practical, if possible before the next storm event. Repairs that cannot be completed within two weeks shall be documented and a report explaining why they cannot be repaired. This report shall be submitted to the Regional Water Board **within 72 hours** of identifying damaged or obstructed drainage ditch.
17. The Discharger shall provide the Regional Board a copy of the annual inspection report submitted to the Division of Safety of Dams (DSOD). The Discharger shall take appropriate actions to remedy damage as required by the DSOD.

18. The Discharger shall provide proof to the Regional Board **within sixty days after adoption of this Order** that the deed to the property or properties containing the Waste Rock Facilities, Mine Pits and Tailings Impoundment Facility, or some other instrument that is normally examined during title search, has been modified to include, in perpetuity, a notation to any potential purchaser of the property stating that:
- a. the parcel has been used for disposal of solid and liquid mining wastes;
 - b. land use options for the parcel are restricted in accordance with the post-closure land uses set forth in the post-closure plan and in WDRs for the mine site and mine waste management units; and
 - c. in the event that the Discharger defaults on carrying out either the post-closure maintenance plan or any corrective action needed to address a release, then the responsibility for carrying out such work falls to the property owner.
7. The Central Valley Water Board will review this Order periodically and may revise requirements when necessary.

F. REPORTING REQUIREMENTS

1. The Discharger shall comply with the reporting requirements specified in this Order, in Monitoring and Reporting Program Order R5-2012-0010 and in the Standard Provisions and Reporting Requirements for Mining Wastes, dated February 2009.
2. The Discharger shall complete the tasks outlined in these WDRs and the attached Monitoring and Reporting Program R5-2012-0010 in accordance with the following time schedule:
 - a. By **1 May each year until complete**, the Discharger shall submit documents and drawings for the coming closure construction season at the TIF. The submittal should include construction goals, time lines and a quality assurance plan.
 - b. By **1 June 2012** shall submit Propose alternative locations to collect representative samples of pump-back waters from the East and West Waste Rock Facilities (Provision E.5).
 - c. **By 30 July each year** submit update and status review of the TIF Closure.
 - d. **By 30 April each year**, submit the annual review and update of the status of financial assurances.

- e. **By 1 January 2022**, complete closure of the TIF.
 - f. **By 60 days after completion of TIF closure construction**, submit a final TIF Closure Report including as-built drawings and an evaluation of cover integrity.
3. In the event of any change in ownership of the Facility, the Discharger shall notify the succeeding owner or operator in writing of the existence of this Order. A copy of that notification shall be sent immediately to the Central Valley Water Board. To assume ownership as Discharger under this Order, the succeeding owner must apply in writing to the Executive Officer requesting transfer of the Order. The request must contain the requesting entity's full legal name, the state of incorporation if a corporation, the name and address and telephone number of the persons responsible for contact with the Central Valley Water Board, and a statement. The statement shall comply with the signatory paragraph of Standard Provision VIII.A.5 and state that the new owner or operator assumes full responsibility for compliance with this Order. Failure to submit the request shall be considered a discharge without requirements, a violation of the Water Code. Transfer shall be approved or disapproved by the Executive Officer.
 4. The Discharger shall maintain a copy of this Order at the facility and make it available at all times to facility operating personnel, who shall be familiar with its contents, and to regulatory agency personnel. All other site operating records required by this Order may be maintained offsite, but must be available to Central Valley Water Board staff within 48 hours of being requested.
 5. The Discharger shall immediately notify the Central Valley Water Board of any flooding, equipment failure, slope failure, or other change in site conditions which could impair the integrity of waste or leachate containment facilities or precipitation and drainage control structures.
 6. For the purpose of resolving any disputes arising from or related to the Water Code, any regulations promulgated thereunder, these WDRs, or any other orders governing this site, the Discharger, its parents and subsidiaries, and their respective past, present, and future officers, directors, employees, agents, shareholders, predecessors, successors, assigns, and affiliated entities, consent to jurisdiction of the Courts of the State of California.
 7. As required by the California Business and Professions Code sections 6735, 7835, and 7835.1, all reports shall be prepared by a registered professional or their subordinate and signed by the registered professional.
 8. All reports must be submitted to the Central Valley Water Board. Electronic copies of all reports and analytical results are to be submitted over the Internet to the State Water Board Geographic Environmental Information Management System database (GeoTracker) at <http://geotracker.swrcb.ca.gov>. Electronic copies are due to GeoTracker concurrent with the corresponding hard copy. Electronic submittals shall comply with GeoTracker standards and procedures as specified on the State Water Board's web site.

If, in the opinion of the Executive Officer, the Discharger fails to comply with the provisions of this Order, the Executive Officer may refer this matter to the Attorney General for judicial enforcement, may issue a complaint for administrative civil liability, or may take other enforcement actions. Failure to comply with this Order or with the WDRs may result in the assessment of Administrative Civil Liability of up to \$10,000 per violation, per day, depending on the violation, pursuant to the Water Code, including sections 13268, 13350 and 13385. The Central Valley Water Board reserves its right to take any enforcement actions authorized by law.

Any person aggrieved by this action of the Central Valley 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 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

or will be provided upon request.

I, Pamela C. Creedon, Executive Officer, do hereby certify the foregoing is a full, true and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on 2 February 2012.

Original signed by

PAMELA C. CREEDON, Executive Officer

Attachments

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM R5-2012-0010

FOR
HOMESTAKE MINING COMPANY OF CALIFORNIA

FOR
CLOSURE AND POST-CLOSURE MAINTENANCE
MCLAUGHLIN MINE
LAKE, NAPA, AND YOLO COUNTIES

This Monitoring and Reporting Program is issued to the Homestake Mining Company of California (hereafter referred to as "Discharger"). Compliance with this Monitoring and Reporting Program (MRP), and with the companion Standard Provisions and Reporting Requirements for Mining Wastes is ordered by Waste Discharge Requirements Order R5-2012-0010. Failure to comply with this Program, or with the Standard Provisions and Reporting Requirements for Mining Wastes dated February 2009, constitutes noncompliance with the WDRs and with the Water Code, which can result in the imposition of civil liability.

A. MONITORING

The Discharger shall comply with the monitoring program provisions of California Code of Regulations, title 27 ("Title 27") for groundwater in accordance with this MRP and the Monitoring Specifications in the Standard Provisions.

All point-of-compliance monitoring wells established for the detection monitoring program shall constitute the monitoring points for the groundwater Water Quality Protection Standard. All mine pit lakes and tailings impoundment monitoring locations; groundwater monitoring wells; pump-back system monitoring points; spring and seep monitoring locations and surface water monitoring locations shall be sampled and analyzed for monitoring parameters and constituents of concern as indicated and listed in the tables of this MRP.

The Discharger may, upon approval, use alternative analytical test methods, including new USEPA approved methods, provided the methods have method detection limits equal to or lower than the analytical methods specified in this Monitoring and Reporting Program. All metals analyses shall be for dissolved metals.

The Discharger shall conduct monitoring and inspections as described in the summary table below. Detailed monitoring and inspection requirements are provided in the following sections of this MRP.

Facility Monitoring and Inspection Summary		
Activity	Inspection/Monitoring Frequency	Notes
Monitoring		
Pit Lakes and Tailings Impoundment Monitoring	Monthly, Annually	See Section A.1
Groundwater Monitoring	Semiannually	See Section A.2
Pump back System	Monthly, Annually	See Section A.3
Surface water Monitoring	Semiannually	See Section A.4
Spring and Seep Monitoring	Semiannually, Annually	See Section A.5
Inspections		
Annual Facility Inspection	Annually	See Section A.6.a
Storm Events	Following Major Storm Event	See Section A.6.b

1. Pit Lakes and Tailings Impoundment

The North and South Mine Pit Lakes and the tailings impoundment samples shall be collected from the Mine Pit Lakes and the Tailings Impoundment in accordance with the table below and all annual samples shall be sampled in the Spring Quarter (April – June):

Table 1 – Pit Lakes and Tailings Impoundment		
<u>Parameters</u>	<u>Units</u>	<u>Frequency</u>
<u>Field Parameter</u>		
Freeboard	Feet & Tenths	Monthly
pH	pH number	Annually
Temperature	°C	Annually
Specific Conductance	µmhos/cm	Annually
<u>Monitoring Parameters</u>		
Total Dissolved Solids	mg/L	Annually
Total Hardness	mg/L	Annually
Bicarbonate	mg/L	Annually
Calcium	mg/L	Annually
Chloride	mg/L	Annually
Potassium	mg/L	Annually
Sulfate	mg/L	Annually
Sodium	mg/L	Annually
Metals (arsenic, boron, chromium, copper, mercury & nickel)	ug/L	Annually
Total Cyanide (tailings pond only)	ug/L	Annually

Results from annual sampling shall be reported with the Annual Monitoring Report, an evaluation of Mine Pit Lake and Tailings Impoundment water quality and any potential impacts on surface water quality shall be included in the Report. Metal analysis shall be reported as dissolved (filtered). Freeboard data shall be collected monthly and reported in the Semiannual Monitoring Report; water samples shall be collected at a convenient location at least 50 feet from the influent structure.

2. Groundwater

The Discharger shall operate and maintain a groundwater monitoring system that complies with the applicable provisions of Title 27, section 20415 in accordance with a Monitoring Program approved by the Executive Officer. The Discharger shall collect, preserve, and transport groundwater samples in accordance with the approved Sample Collection and Analysis Plan.

The groundwater monitoring system shall consist of the following wells:

Area	Monitor Wells
Mine Pit Lakes	S-01, S-02B and S-10
Waste Rock Facilities	S-05 and S-06
Tailings Impoundment Facility	N-1, N-2A, N-5, N-8A, N-8B, N-8C and N-12

Groundwater samples shall be collected in compliance with an approved groundwater monitoring plan. Samples shall be collected and analyzed for the monitoring parameters in accordance with the methods and frequency specified in Table 2. Metal analysis shall be reported as dissolved (filtered).

Table 2 - Groundwater Monitoring		
<u>Parameters</u>	<u>Units</u>	<u>Frequency</u>
Field Parameters		
Groundwater Elevation	Ft., & hundredths, MSL	Semi-annually
Temperature	°C	Semi-annually
Specific Conductance	µmhos/cm	Semi-annually
pH	pH number	Semi-annually
Monitoring Parameters		
Total Alkalinity	mg/L	Semi-annually
Carbonate Alkalinity	mg/L	Semi-annually
Bicarbonate Alkalinity	mg/L	Semi-annually
Hydroxide Alkalinity	mg/L	Semi-annually
Total Hardness	mg/L	Semi-annually
Total Dissolved Solids	mg/L	Semi-annually
Sulfate	mg/L	Semi-annually
Potassium	mg/L	Semi-annually
Sodium	mg/L	Semi-annually
Calcium	mg/L	Semi-annually
Magnesium	mg/L	Semi-annually
Chloride	mg/L	Semi-annually
Metals (arsenic, boron, copper, lead, mercury, manganese, nickel, & zinc)	µg/L	Semi-annually
Total Cyanide (N series wells only)	µg/L	Semi-annually

Notes: Total Cyanide is not required to be analyzed at Mine Pit area and Waste Rock area wells (S-01, S-02B, S-05, S-06 and S-10).

The groundwater monitoring parameters shall also be evaluated each reporting period with regards to the cation/anion balance, and the results shall be graphically presented using a Stiff diagram, a Piper graph or a Schueller plot.

3. Pump-Back System Monitoring

Samples shall be collected from each major waste rock facility leachate collection sump in the Pump-back System. The existing Pump-back System sampling points at sumps S-11, S-12 and S-13 are difficult to sample and present health and safety concerns to sampling personnel. Therefore, the Discharger shall propose and install if necessary new

monitoring points for each of the leachate collection sumps. Metal analysis shall be reported as dissolved (filtered). The Pump-back System shall be sampled and analyzed for the parameters specified in Table 3.

Table 3 – Pump-Back System Monitoring		
<u>Parameters</u>	<u>Units</u>	<u>Frequency</u>
Field Parameter (for all points)		
Flow Rate	gallons/month	Monthly
Temperature	°C	Annually
Specific Conductance	umhos/cm	Annually
pH	pH number	Annually
Monitoring Parameters		
Total Alkalinity	mg/L	Annually
Total Hardness	mg/L	Annually
Total Dissolved Solids	mg/L	Annually
Sulfate	mg/L	Annually
Sodium	mg/L	Annually
Metals (arsenic, boron, copper, lead, manganese, mercury and nickel)	ug/L	Annually

4. Surface Water Monitoring

Surface water monitor reports shall be submitted with the corresponding semi-annual groundwater monitoring report and shall include an evaluation of potential impacts of the facility on surface water quality and compliance with the Water Quality Protection Standard. All surface water samples shall be grab samples. The surface water sampling program shall consist of the following locations:

Hunting Creek 5 (HC-5)

On an east tributary to Hunting Creek in the SE1/4 of Section 2, T11N, R5W. This location is upgradient of the West Waste Rock Facility and acts as a background location.

Hunting Creek 9 (HC-9)

On a west tributary to Hunting Creek, draining Quarry Valley and parallel to the Old Morgan Valley Road. The station is south of the center of Section 28, T12N, R5W. The

location is north of the old Morgan Valley Road, west of a small bridge crossing Hunting Creek and south of a rock outcrop. A steel post is approximately 10 feet south of the location. This location monitors the Tailings Impoundment Facility.

Hunting Creek 10 (HC-10)

On the main channel of Hunting Creek located immediately below the concrete weir in the NE ¼ of Section 11, T11N, R5W. This location is downstream of the West Waste Rock Facility.

Knoxville Creek 3 (KC-3)

In the NW ¼ of Section 7, T11N, R4W, located upstream of the county road crossing and downstream of the Devils Head Road. This location is downstream of the East Waste Rock Facility and the North and South Mine Pit Lakes.

Surface water samples will be analyzed for the constituents listed in Table 4. Metal analysis shall be reported as dissolved (filtered).

Table 4 - Surface Water Monitoring		
<u>Parameters</u>	<u>Units</u>	<u>Frequency</u>
Field Parameter		
Flow (estimate)	gpm	Semi-annually
Temperature	°C	Semi-annually
Specific Conductance	umhos/cm	Semi-annually
pH	pH number	Semi-annually
<u>Monitoring Parameters</u>		
Total Alkalinity	mg/L	Semi-annually
Bicarbonate Alkalinity	mg/L	Semi-annually
Carbonate Alkalinity	mg/L	Semi-annually
Hydroxide Alkalinity	mg/L	Semi-annually
Total Hardness	mg/L	Semi-annually
Total Suspended Solids	mg/L	Semi-annually
Total Dissolved Solids	mg/L	Semi-annually
Chloride	mg/L	Semi-annually
Sodium	mg/L	Semi-annually
Potassium	mg/L	Semi-annually
Calcium	mg/L	Semi-annually
Magnesium	mg/L	Semi-annually
Sulfate	mg/L	Semi-annually
Ammonia	mg/L	Semi-annually
Metals (arsenic, boron, chromium, copper, mercury, nickel & zinc)	ug/L	Semi-annually
Total Cyanide (<u>HC-9 & HC-10 only</u>)	ug/L	Semi-annually

All surface water monitoring parameters shall be graphed to show historical trends at each sample location.

5. Spring and Seep Monitoring

Existing and any new springs and seeps immediately down gradient of the McLaughlin Mine Pit on the south and east sides shall be monitored to determine if the pit lake water is discharging. Existing springs are: 1420BS, 1450BS*, 1550KS, 1560KS, 1600SEEP, 1400KA(adit), 1550KA(adit), 1680DS, and 1590DS as shown and described in

“McLaughlin Reclamation Project, Annual Monitoring Summary Report”. Spring and seep monitoring shall consist of the parameters listed in Table 5.

Table 5. Spring and Seep Monitoring		
<u>New Springs & Seeps</u>	<u>Units</u>	<u>Frequency</u>
Visual Inspection to identify New Springs		Semi-Annually
<u>Existing Springs & Seeps</u>		
Field Parameters		
Flow Rate	gpm	Semi-annually
pH	pH units	Semi-annually
Electrical Conductivity	umhos/cm	Semi-annually
Temperature	°C	Semi-annually
Parameters		
Total Alkalinity	mg/L	Annually
Total Hardness	mg/L	Annually
Total Dissolved Solids	mg/L	Annually
Sulfate	mg/L	Annually
Bicarbonate	mg/L	Annually
Chloride	mg/L	Annually
Metals (arsenic, boron, sodium, chromium, copper, manganese, mercury, & nickel)	ug/L	Annually

* 1450BS shall be monitored for field parameters only.

Annual samples shall be collected during the Spring quarter (April – June).

6. Facility Monitoring

a. Facility Inspection

Annually, prior to the anticipated rainy season, but no later than **30 September**, the Discharger shall conduct an inspection of the facility. The inspection shall assess the status of the following:

Pump-Back System – collection pipes, sumps, discharge pipes and pumps.

Site Security – fences, gates and signs.

Precipitation and drainage Controls - for the Mine Pit Lakes, the Waste Rock Facilities and the Tailings Impoundment Facility.

Tailings Impound Facility Cover, East and West Waste Rock Facility Covers and Mine Pit Waste Rock Covers – settlement, subsidence, erosion, rilling, cracking, thin or poor vegetation cover and berms.

Tailings Impoundment Dam – rilling, erosion, poor vegetation cover, animal burrows, or other damage.

The inspection shall note damage to equipment or systems, (including wells, etc.), evaluate their continued ability to comply with Waste Discharge Requirements and shall include the Standard Observations contained in section F.4.f. of Standard Provisions and Reporting Requirements. Any necessary construction, maintenance, or repairs shall be completed by **31 October**. By **15 November** of each year, the Discharger shall submit an annual report describing the results of the inspection and the repair measures implemented, including photographs of the problem and the repairs.

b. Storm Events

The Discharger shall inspect all precipitation, diversion, and drainage facilities for damage **within 7 days** following *major storm events*. Necessary repairs shall be completed **within 30 days** of the inspection. The Discharger shall report any damage and subsequent repairs within 45 days of completion of the repairs, including photographs of the problem and the repairs.

B. REPORTING

The Discharger shall report all required monitoring data and information, and results of all required facility inspections **semiannually** as required in this Monitoring and Reporting Program and as required in the Standard Provisions. In reporting the monitoring data required by this program, the Discharger shall arrange the data in tabular form so that the date, the constituents, the concentrations, and the units are readily discernible. The data shall be summarized in such a manner so as to illustrate clearly the compliance with waste discharge requirements or the lack thereof. Historical and current monitoring data shall be graphed at least once annually. Graphs for the same constituent shall be plotted at the same scale to facilitate visual comparison of

monitoring data. A short discussion of the monitoring results, including notations of any water quality violations shall precede the tabular summaries. Data shall also be submitted in an acceptable digital format.

Method detection limits and practical quantitation limits shall be reported. Constituents of Concern that are identified at concentrations below the reporting limit but above the method detection limit shall be reported as an estimated concentration (J-flagged) . Field and laboratory tests shall be reported in the quarterly or semiannual monitoring reports. The results of any monitoring done more frequently than required at the locations specified herein shall be reported to the Central Valley Water Board.

As required by the California Business and Professions Code sections 6735, 7835, and 7835.1, all Groundwater Monitoring Reports shall be prepared under the direct supervision of a Registered Engineer or Professional Geologist and signed/stamped by the registered professional.

REQUIRED MONITORING REPORTS AND SUBMITTAL DATES:

1. Semiannual Groundwater, Surface Water and Spring and Seep Monitoring Reports

Results from the groundwater and surface water detection monitoring programs shall be submitted Semi-annually on **30 July and 30 January each year**. Results from the Spring and Seep monitoring program shall be reported Annually. The reports shall include all water quality data and observation collected during the reporting period. At a minimum Semi-annual Reports shall include sampling and data collection in Sections A.2 and A.4 of this Monitoring and Reporting Program; the information specified in Standard Provisions and Reporting Requirements for Mining Wastes (2009); and the information specified in the Waste Discharge Requirements shall be reported.

2. Annual Monitoring Summary Report

The Discharger shall submit an Annual Monitoring Summary Report to the Board covering the previous monitoring year on **30 July of each year**. The annual report shall include sampling and data collection in Sections A.1 through A.5 of this Monitoring and Reporting Program; and the information specified in Standard Provisions and Reporting Requirements for Mining Wastes (2009), Section VIII.B. of the *“Reports to be Filed with the Board.”*

3. Facility Monitoring Report

Annually, prior to the anticipated rainy season, but no later than **30 September**, the Discharger shall conduct an inspection of the facility (Section A.6. of this Monitoring and Reporting Program). The inspection shall assess damage to the drainage control

system, groundwater monitoring equipment (including wells, etc.), and shall include the Standard Observations contained in Section XII.S. of Standard Provisions and Reporting Requirements for Mining Wastes (2009).

4. Response to a Release

If the Discharger determines that there is significant statistical evidence of a release (i.e. the initial statistical comparison or non-statistical comparison indicates, for any Constituent of Concern or Monitoring Parameter, that a release is tentatively identified), the Discharger shall immediately notify the Board verbally as to the Monitoring Point(s) and constituent(s) or parameter(s) involved. The Discharger shall provide written notification by certified mail within seven days of such determination and implement Response to Release section of the Standard Provisions and Reporting Requirements for Mining Wastes (2009).

5. Water Quality Protection Standard Report

Any proposed changes in a statistical method or concentration limits for a constituent of concern or monitoring parameter a Water Quality Protection Standard Report shall be submitted and include the information required in Section C.1. of this Monitoring Reporting Program. Any changes to Water Quality Protection Standards shall be approved by the Executive Officer in a Revised Monitoring and Reporting Program.

C. WATER QUALITY PROTECTION STANDARD

1. Water Quality Protection Standard

For each waste management unit (Unit), the Water Quality Protection Standard shall consist of all constituents of concern, the concentration limit for each constituent of concern, the point of compliance, and all water quality monitoring points. The Water Quality Protection Standard for naturally occurring waste constituents consists of the constituents of concern, the concentration limits, and the point of compliance and all monitoring points. The Discharger submitted a pre-mining Water Quality Protection Standard in 1984 and has updated the concentration limits as additional data is collected. Elements of the Water Quality Protection Standard are given in sections below.

If subsequent sampling of the background monitoring point(s) indicates significant water quality changes due to either seasonal fluctuations or other reasons unrelated to waste management activities at the site, the Discharger may request modification of the Water Quality Protection Standard.

2. Constituents of Concern

The constituents of concern include all the waste constituents, their reaction products, and hazardous constituents that are reasonably expected to be in or derived from waste contained in the Unit. The constituents of concern for the facility are pH, Total Dissolved Solids, hardness, total alkalinity, bicarbonate alkalinity, carbonate alkalinity, hydroxide alkalinity, sodium, potassium, calcium, magnesium, chloride, sulfate, arsenic, boron, total chromium, copper, lead, mercury, zinc, nickel and total cyanide.

3. Concentration Limits

For a naturally occurring constituent of concern, the concentration limit for each constituent of concern shall be determined as follows:

By calculation in accordance with a statistical method pursuant to Title 27, section 20415; or

By an acceptable alternate statistical method in accordance with Title 27, section 20415.

The Discharger submitted a proposed method for calculating concentration limits in the December 1984 *“Water Quality Statistical Evaluation Report of Background Water Quality Data”*. The Maximum Likely Concentration or upper 1-tailed prediction interval limit at the 95% confidence limit is calculated for the next ten samples for wells, or the next five samples for springs.

The Discharger shall report the concentration limits in each semiannual and annual monitoring report, and shall update them annually. Recently updated (using data up to June 2011) Maximum Likely Limits for groundwater wells are summarized in the tables below. These are to be updated annually as required in Section B.2 of this MRP.

Maximum Likely Concentrations for spring locations cannot be calculated due to the limited data population. The Discharger shall submit Maximum Likely Concentrations for spring locations when the data population reaches ten independent samples.

GROUNDWATER WELLS AT MINE PITS AND WASTE ROCK FACILITY
Maximum Likely Concentrations – 95% Confidence Level

Constituent		<u>S-01</u>	<u>S-02B</u>	<u>S-03</u>	<u>S-05</u>	<u>S-06</u>	<u>S-10</u>
Alkalinity	mg/L	308	2468	832	529	829	2074
Hardness	mg/L	1149	6435	1650	642	8431	308
TDS	mg/L	2305	11499	2158	5498	10621	8276
Sulfate	mg/L	1340	6856	1011	188	7502	208
Calcium	mg/L	193	777	51	12	186	44
Bicarb	mg/L	396	3211	1214	778	1123	3162
Magnesium	mg/L	166	1123	367	145	1947	48
Chloride	mg/L	49	2279	67	3415	291	3454
Arsenic	ug/L	228	113	6	2	8	163
Boron	ug/L	4415	138910	844	5276	2857	141690
Copper	ug/L	14	79	99	27	213	98
Lead	ug/L	2	245	4	1	40	12
Manganese	ug/L	826	23330	63	62	498	184
Nickel	ug/L	2	663	33	14	83	15
Zinc	ug/L	0	79	403	16	276	30

GROUNDWATER WELLS AT TAILINGS IMPOUNDMENT FACILITY
Maximum Likely Concentrations – 95% Confidence Level

Constituent		<u>N-01</u>	<u>N-2A</u>	<u>N-05</u>	<u>N-8A</u>	<u>N-8B</u>	<u>N-8C</u>	<u>N-12</u>
Alkalinity	mg/L	484	410	328	111	77	123	774
Hardness	mg/L	574	558	108	806	282	183	773
TDS	mg/L	1519	2366	4020	4753	3074	1410	1039
Sulfate	mg/L	297	2503	1236	511	22	258	127
Calcium	mg/L	133	20	34	116	35	34	34
Bicarb	mg/L	951	588	315	105	111	179	1163
Magnesium	mg/L	50	20	7	143	4	28	151
Chloride	mg/L	42	161	1791	2778	1268	892	33
Arsenic	ug/L	0	10	4	8	2	1	2
Boron	ug/L	783	27055	108120	2295	3113	2562	1136
Copper	ug/L	14	24	25	45	36	34	14
Lead	ug/L	6	0	11	12	13	8	4
Manganese	ug/L	494	49	37	89	68	103	320
Nickel	ug/L	7	3	14	23	24	81	7
Zinc	ug/L	177	34	27	114	81	66	38

MONITORING AND REPORTING PROGRAM ORDER NO. R5-2012-0010
HOMESTAKE MINING CO. OF CALIFORNIA
CLOSURE AND POST CLOSURE MAINTENANCE
MCLAUGHLIN MINE
LAKE, NAPA AND YOLO COUNTIES

-14-

The Discharger shall implement the above monitoring program on the effective date of this Order.

Ordered by: _____
PAMELA C. CREEDON, Executive Officer

2 February 2012
(Date)

INFORMATION SHEET

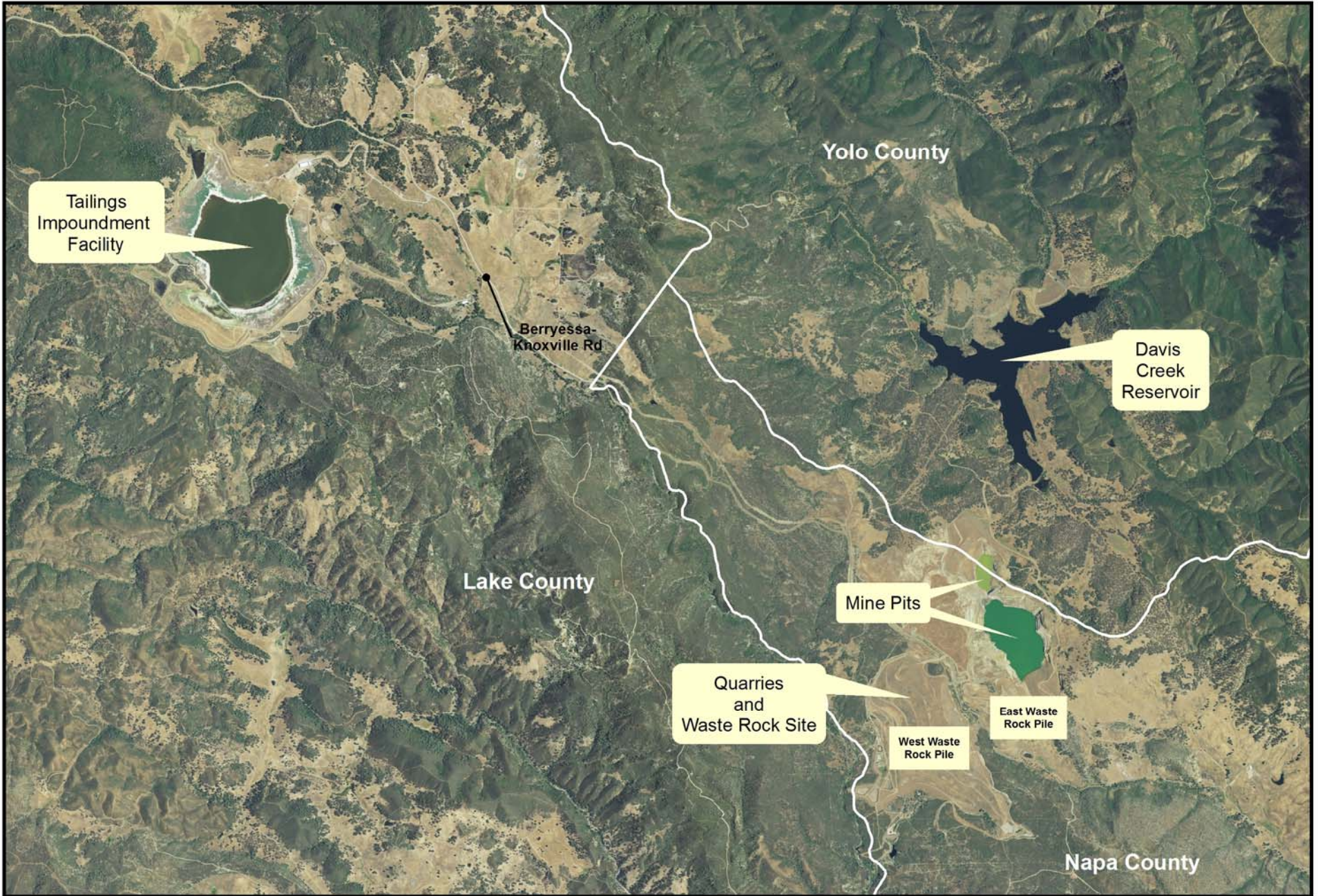
ORDER NO. R5-2012-0010

WASTE DISCHARGE REQUIREMENTS
HOMESTAKE MINING CO. OF CALIFORNIA
CLOSURE AND POST-CLOSURE MAINTENANCE OF
MCLAUGHLIN MINE
LAKE, NAPA AND YOLO COUNTIES

Homestake Mining Company of California owns and manages the McLaughlin Mine an inactive former gold mine in Lake, Napa and Yolo Counties. The mine is in the process of final closure, when closed the former mine will maintain five Group B mining waste management units on 1,200 acres, including two mine pit lakes and a permanent pond on the former tailings waste unit. The units no longer accept new mining waste, the two waste rock facilities and the waste rock contained within the mine pits were previously closed. The tailings impoundment facility (TIF) will require an extended period of up to ten years to achieve final closure.

These Waste Discharge Requirements prescribe final closure requirements for the TIF; and post-closure maintenance requirements for the TIF, the two mine pits and the two waste rock facilities.

RDA: 27 October 2011



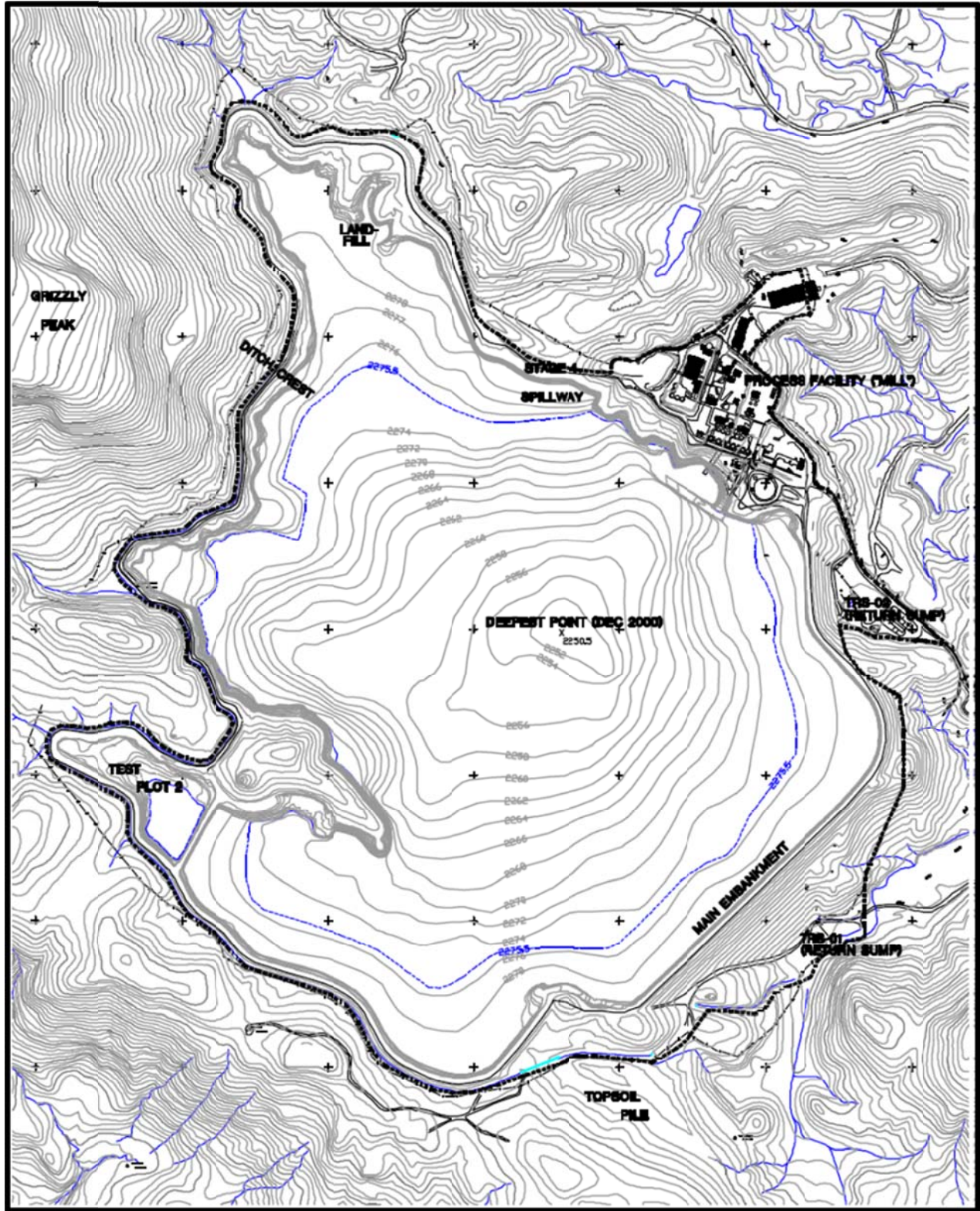
Attachment A



**Mclaughlin Mine
Location Map**

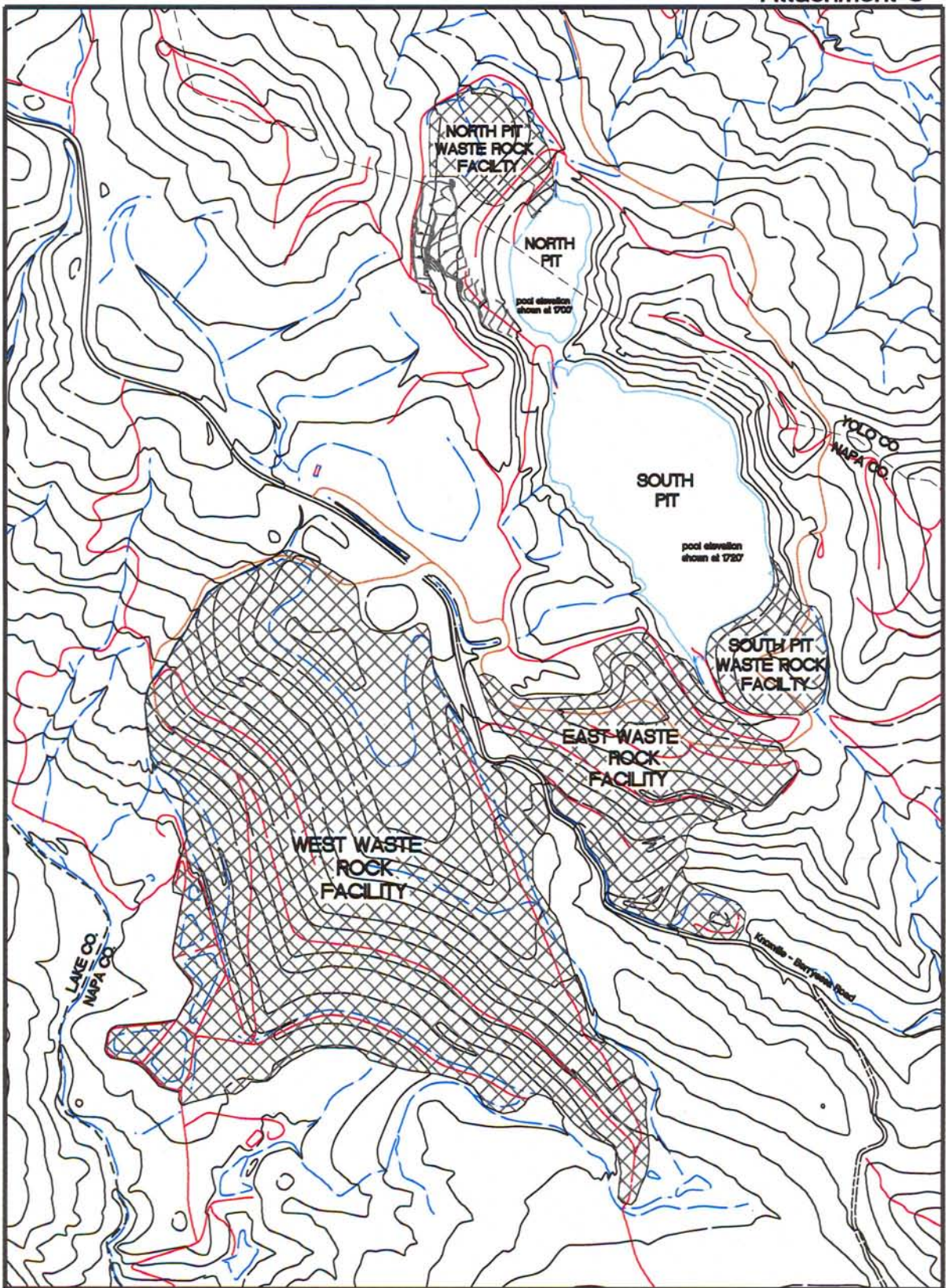


Attachment B



Mclaughlin Mine
Tailings Impoundment Facility





Mclaughlin Mine
Mine Pits and Waste Rock Facilities



Partial Table of Contents for
STANDARD PROVISIONS AND REPORTING REQUIREMENTS
MINING WASTES
For Title 27 (27CCR §20005 et seq.)
FEBRUARY 2009

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CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

STANDARD PROVISIONS AND REPORTING REQUIREMENTS
FOR
WASTE DISCHARGE REQUIREMENTS
FOR
DISCHARGES OF MINING WASTES
REGULATED BY TITLE 27
(27 CCR §20005 et seq.)
MINING FACILITIES

FEBRUARY 2009

I. APPLICABILITY

- A. These Standard Provisions and Reporting Requirements are applicable to “mining waste” disposal sites that are regulated pursuant to the provisions of the California Code of Regulations, title 27 section 20005 et seq. (27 CCR or Title 27). The term “Mining waste” is defined in title 27 section 22480.
- B. For this document, WMU is defined as a waste management unit containing mining waste.
- C. “Order,” as used throughout this document, means the Waste Discharge Requirements to which these Standard Provisions and Reporting Requirements are incorporated.
- D. The requirements prescribed herein do not authorize the commission of any act causing injury to the property of another, and do not protect the Discharger from liabilities under federal, state, or local laws. This Order does not convey any property rights or exclusive privileges.
- E. The provisions of this Order are severable. If any provision of this Order is held invalid, the remainder of this Order shall not be affected.
- F. If there is any conflicting or contradictory language between the Waste Discharge Requirements (WDRs), the Monitoring and Reporting Program (MRP), or the Standard Provisions and Reporting Requirements (SPRR), then language in the WDRs shall govern over either the MRP or the SPRR, and language in the MRP shall govern over the SPRR.

- G. Unless otherwise stated, all terms are as defined in California Water Code (CWC) section 13050 and in title 27 section 20164.

II. TERMS AND CONDITIONS

- A. Failure to comply with any waste discharge requirement, monitoring and reporting requirement, or Standard Provisions and Reporting Requirement, or other order or prohibition issued, reissued, or amended by the Central Valley Water Board or the State Water Resources Control Board, or intentionally or negligently discharging waste, or causing or permitting waste to be deposited where it is discharged into the waters of the state and creates a condition of pollution or nuisance, is a violation of these waste discharge requirements and the California Water Code, which can result in the imposition of civil liability [CWC §13350(a)]
- B. After notice and opportunity for a hearing, this Order may be terminated or modified for cause, including, but not limited to [CWC §13381]:
1. Violation of any term or condition contained in this Order;
 2. Obtaining this Order by misrepresentation, or failure to disclose fully all relevant facts;
 3. A change in any condition that results in either a temporary or permanent need to reduce or eliminate the authorized discharge;
or
 4. A material change in the character, location, or volume of discharge.
- C. Before initiating a new discharge or making a material change in the character, location, or volume of an existing discharge, the Discharger shall file a new report of waste discharge, or other appropriate joint technical document, with the Central Valley Regional Water Quality Control Board (hereafter Central Valley Water Board) [CWC §13260(c) and §13264(a)]. A material change includes, but is not limited to, the following:
1. An increase in area or depth to be used for solid waste disposal beyond that specified in waste discharge requirements;
 2. A significant change in disposal method, location, or volume (e.g., change from land disposal to land treatment); or
 3. A change in the type of waste being accepted for disposal.

- D. Representatives of the Central Valley Water Board may inspect the facilities to ascertain compliance with the waste discharge requirements. The inspection shall be made with the consent of the owner or possessor of the facilities or, if the consent is refused, with a duly issued warrant. However, in the event of an emergency affecting the public health or safety, an inspection may be made without consent or the issuance of a warrant [CWC §13267(c)].
- E. The Central Valley Water Board will review this Order periodically and will revise these waste discharge requirements when necessary [CWC §13263(e) and 27 CCR §21720(b)].
- F. Except for material determined to be confidential in accordance with California law and regulations, all reports prepared in accordance with terms of this Order shall be available for public inspection at the offices of the Central Valley Water Board [CWC §13267(b)]. Data on waste discharges, water quality, geology, and hydrogeology shall not be considered confidential.
- G. The Discharger shall submit to the Central Valley Water Board for review and approval a closure and post-closure maintenance plan prepared in accordance with Closure and Post-Closure for Mining WMUs [27 CCR §22510].

III. GENERAL PROVISIONS

- A. The discharge shall neither cause nor contribute to the contamination, degradation, or **pollution of groundwater** via the release of waste constituents in either liquid or gaseous phase.
- B. Wastes shall not be discharged to any surface water body without a Stormwater Permit or a NPDES permit.
- C. The discharge shall neither cause nor contribute to any **surface water pollution**, contamination, or nuisance, including, but not limited to:
 - 1. floating, suspended, or deposited macroscopic particulate matter or foam;
 - 2. increases in bottom deposits or aquatic growth;
 - 3. an adverse change in temperature, turbidity, or apparent color beyond natural background levels;

4. the creation or contribution of visible, floating, suspended, or deposited oil or other products of petroleum origin;
 5. the introduction or increase in concentration of toxic or other pollutants/contaminants resulting in unreasonable impairment of beneficial uses of waters of the State.
- D. The discharge shall not cause any increase in the concentration of waste constituents in soil-pore gas, soil-pore liquid, soil, or other geologic materials outside of the waste management unit (WMU) if such waste constituents could migrate to waters of the State—in either the liquid or the gaseous phase—and cause **a condition of contamination, pollution, degradation, or nuisance**.
- E. The discharge shall not cause the release of pollutants, or waste constituents in a manner which could cause a condition of contamination, pollution, degradation, or nuisance to occur, as indicated by the most appropriate statistical or non-statistical data analysis method and retest method listed in the Monitoring and Reporting Program.
- F. The Discharger shall take **all reasonable steps to minimize any adverse impact** to the waters of the state resulting from noncompliance with this Order. (“Order,” as used throughout this document, means the Waste Discharge Requirements). Such steps shall include accelerated or additional monitoring as necessary to determine the nature, extent, and impact of the noncompliance.
- G. In the event of any change of ownership or responsibility for construction, operation, closure, or post-closure maintenance of the waste discharge facilities described in this Order, the Discharger shall notify the Central Valley Water Board prior to the effective date of the change and shall include a statement by the new Discharger that construction, operation, closure, or post-closure maintenance will be in compliance with this Order and any revisions thereof [27 CCR §21710(c)(1)].
- H. The Discharger shall notify the Central Valley Water Board of a material change in; the types, quantity, or concentrations of wastes discharged; site operations and features; or proposed closure procedures, including changes in cost estimates. This notification shall be given a reasonable time before the changes are made or become effective. No changes shall be made without Central Valley Water Board approval following authorization for closure pursuant to the site Notification of Closure [27 CCR §21710(a)(4)].

- I. The Discharger shall maintain legible records of the volume and type of each waste discharged at each WMU or portion of a WMU, and the manner and location of discharge. These records shall be on forms approved by the State Water Resources Control Board or Central Valley Water Board and shall be maintained at the waste management facility until the beginning of the post-closure maintenance period. These records shall be available for review by representatives of the State Water Resources Control Board or Central Valley Water Board at any time during normal business hours. At the beginning of the post closure maintenance period, copies of these records shall be sent to the Central Valley Water Board. [27 CCR §21720(f)].
- J. All WMUs shall be protected from flooding as required in title 27 section 22490(b).
- K. Diversion and drainage facilities shall be designed and constructed to accommodate the anticipated volume of precipitation and peak flows from surface runoff as follows [27 CCR §22490(h)(1)]:
 1. Group A – one 25 year, 24 hour storm;
 2. Group B – one 10 year, 24 hour storm; and
 3. Group C – one 10 year, 24 hour storm.
- L. Precipitation on Group A and B waste piles that is not diverted by containment structures shall be collected and managed through the leachate collection and removal system (LCRS). The Central Valley Water Board can make exemptions to this requirement if the collected fluid does not contain indicator parameters or waste constituents in excess of applicable water quality objectives [27 CCR §22490(h)(2)].
- M. Dischargers shall comply with special requirements for surface impoundments given in title 27 section 20375. Nevertheless, for Mining Units, Dischargers shall use the precipitation conditions in title 27 section 22490(h)(1).

IV. **FINANCIAL ASSURANCE PROVISIONS**

- A. The Discharger shall establish an irrevocable fund for closure and post-closure maintenance to ensure closure and post-closure maintenance of each classified WMU in accordance with an approved closure and post-closure maintenance plan [27 CCR §22510(f)].

- B. If a lead agency acting under the authority of §2774(a) of the Public Resources code requires assurances of financial responsibility, these assurances can be used to fulfill all comparable requirements provided that:
 - 1. the Central Valley Water Board approves the assurance; and
 - 2. the Central Valley Water Board is named as alternate payee. [27 CCR §22510(g)]

V. DISCHARGE SPECIFICATIONS

- A. The Discharger is responsible for accurate characterization of wastes, including a determination of whether or not wastes will be compatible with containment features and other wastes at the WMU and whether or not the wastes are required to be managed as a Group A, Group B or Group C mining waste [27 CCR §22480]
- B. Group B and Group C WMUs contained with liners shall be designed, constructed, and operated to ensure that wastes will be a minimum of 5 feet above the highest anticipated elevation of underlying groundwater [27 CCR §20240(c), §20330(a), and §22490(f)(6)], including the capillary fringe.
- C. The Discharger shall submit operations plans and any amended operation plans describing those WMU operations which could affect water quality, including, but not limited to [27 CCR §21760(b)]:
 - 1. A description of proposed treatment, storage, and disposal methods;
 - 2. Contingency plans for the failure or breakdown of waste handling facilities or containment systems, including notice or any such failure, or any detection of waste or leachate in monitoring facilities, to the Central Valley Water Board, local governments, and water users downgradient of the WMU(s); and
 - 3. A description of inspection and maintenance programs which will be undertaken regularly during disposal operations and the post-closure maintenance period.

VI. FACILITY SPECIFICATIONS

- A. Surface and subsurface drainage from outside of a WMU shall be diverted from the WMU [27 CCR §20365(e)].

- B. Collection and holding facilities associated with precipitation and drainage control systems shall be emptied immediately following each storm or otherwise managed to maintain the design capacity of the system [27 CCR §20365(d)].
- C. The Discharger shall promptly notify the Central Valley Water Board of any slope failure occurring at a WMU. Any failure which threatens the integrity of containment features or the WMU shall be promptly corrected in accordance with an approved method [27 CCR §21710(c)(2)].

VII. CONSTRUCTION SPECIFICATIONS

- A. All containment structures shall be designed by a California registered civil engineer, and construction shall be supervised and certified by a California registered civil engineer or a certified engineering geologist as meeting the prescriptive standards, or approved engineered alternative design, in accordance with this Order prior to waste discharge. WMUs shall receive a final inspection and approval of the construction by Central Valley Water Board staff before use of the WMU commences [27 CCR §22490(d)].
- B. Any report, or any amendment or revision of a report, that proposes a design or design change that might affect a WMU's containment features or monitoring systems shall be approved by a registered civil engineer or a certified engineering geologist, as appropriate [27 CCR §21710(d)].
- C. Materials used in containment structures shall have appropriate chemical and physical properties to ensure that such structures do not fail to contain waste because of pressure gradients, physical contact with waste or leachate, chemical reactions with soil or rock, climatic conditions, the stress of installation, or because of the stress of daily operations [27 CCR §22490(e) and §20320(a)].
- D. WMU liners shall be designed and constructed to contain the fluid, including gas, waste, and leachate [27 CCR §20330(a)].
- E. Hydraulic conductivities shall be determined primarily by appropriate field test methods in accordance with accepted civil engineering practice. The results of laboratory tests with both water and leachate, and field tests with water, shall be compared to evaluate how the field permeabilities will be affected by leachate. It is acceptable for the Discharger to use appropriate compaction tests in conjunction with laboratory hydraulic conductivity tests to determine field permeabilities

as long as a reasonable number of field hydraulic conductivity tests are also conducted [27 CCR §20320(c)].

- F. Hydraulic conductivities specified for containment structures other than the final cover shall be relative to the fluids (leachate) to be contained. Hydraulic conductivities for the final cover shall be relative to water [27 CCR §20320(b)].
- G. Leachate collection and removal systems shall be designed and operated to function without clogging through the scheduled closure of the WMU and during the post-closure maintenance period. The systems shall be tested at least annually to demonstrate proper operation. The results of the tests shall be compared with earlier tests made under comparable conditions [27 CCR §20340(d)].
- H. Leachate collection and removal systems shall be designed and constructed to ensure that there is no buildup of hydraulic head on the liner. The depth of fluid in the collection sump shall be kept at the minimum needed to ensure efficient pump operation [27 CCR §20340(c)].
- I. For Units constructed (or reconstructed) after July 18, 1997, all construction of liner systems and final cover systems shall be performed in accordance with a Construction Quality Assurance Plan certified by a registered civil engineer or a certified engineering geologist [27 CCR §20323] and approved by the Executive Officer.

VIII. REPORTING REQUIREMENTS

A. General Requirements

1. In the event the Discharger does not comply or will be unable to comply with any prohibition or limitation of this Order for any reason, the Discharger shall **notify the Central Valley Water Board by telephone** as soon as it or its agents have knowledge of such noncompliance or potential for noncompliance, and shall confirm this notification in writing within two weeks. The written notification shall state the nature, time and cause of **noncompliance**, and shall describe the measures being taken to prevent recurrences and shall include a timetable for corrective actions.
2. The Discharger shall **immediately notify the Central Valley Water Board** of any **evidence of a release**, or of any flooding, equipment failure, slope failure, or other **change in site**

conditions which could impair the integrity of waste or leachate containment facilities or of precipitation and drainage control structures.

3. The Discharger shall **mail a copy of each** monitoring **report** and any other reports required by this Order to the appropriate office or the current address if an office relocates. Addresses for each office as of November 2008 are:

California Regional Water Quality Control Board
Central Valley Region
11029 Sun Center Drive #200
Rancho Cordova, CA 95670

California Regional Water Quality Control Board
Central Valley Region
1685 "E" Street
Fresno, CA 93706-2007

California Regional Water Quality Control Board
Central Valley Region
415 Knollcrest Drive, Suite 100
Redding, CA 96002

4. The Discharger shall **retain records of all monitoring information**, including all calibration and maintenance records, all original strip chart recordings of continuous monitoring instrumentation, copies of all reports required by this Order, and records of all data used to complete the application for this Order. Records shall be maintained for a minimum of five years from the date of the sample, measurement, report, or application. This period may be extended during the course of any unresolved litigation regarding this discharge or when requested by the Central Valley Water Board Executive Officer.

Such records shall show the following for each sample:

- a. Identity of sample and of the Monitoring Point or Background Monitoring Point from which it was taken, along with the identity of the individual who obtained the sample;
- b. Date, time, and manner of sampling;
- c. Date and time that analyses were started and completed, and the name of the personnel and laboratory performing each analysis;

- d. Complete procedure used, including method of preserving the sample, and the identity and volumes of reagents used;
- e. Calculation of results; and
- f. Results of analyses, and the method detection limit (MDL) and practical quantitation limit (PQL) for each analysis.

Such records shall also include legible records of the volume and type of each waste discharged at each WMU and the manner and location of discharge. These waste discharge records shall be maintained at the facility until the beginning of the post-closure maintenance period, at which time copies of these records shall be sent to the Central Valley Water Board.

5. **All reports and transmittal letters shall be signed** by persons identified below:
- a. *For a corporation:* by a principal executive officer of at least the level of senior vice-president.
 - b. *For a partnership or sole proprietorship:* by a general partner or the proprietor.
 - c. *For a municipality, state, federal or other public agency:* by either a principal executive officer or ranking elected or appointed official.
 - d. A duly authorized representative of a person designated in a, b or c above if;
 - i. the authorization is made in writing by a person described in a, b, or c of this provision;
 - ii. the authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a WMU, superintendent, or position of equivalent responsibility. (A duly authorized representative may thus be either a named individual or any individual occupying a named position); and
 - iii. the written authorization is submitted to the Central Valley Water Board.

Any person signing a document under this Section shall make the following certification:

"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for

obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.”

6. In reporting the monitoring data, the Discharger shall arrange the **data in tabular form** so that the date, the constituents, the concentrations, and the units are readily discernible. The data shall be summarized in such a manner so as to illustrate clearly the compliance with waste discharge requirements or lack thereof.
7. The results of any monitoring done more frequently than required at the locations specified herein shall be reported to the Central Valley Water Board.

B. Reports to be Filed with the Central Valley Water Board

1. A transmittal **letter** explaining the essential points in each report shall accompany each report. Such a letter shall include a discussion of any violations found since the last such report was submitted, and shall describe actions taken or planned for correcting those violations. If the Discharger has previously submitted a detailed time schedule for correcting the violations, a reference to the correspondence transmitting such schedule will be satisfactory. If no violations have occurred since the last submittal, this shall be stated in the letter of transmittal.
2. Each monitoring report (e.g., Detection Monitoring Report, Constituents of Concern 5-Year Report) shall include a **compliance evaluation summary**. The summary shall contain at least:
 - a. For each monitored ground water body, a description and graphical presentation of the gradient and direction of **ground water flow** under/around the WMU, based upon water level elevations taken during the collection of the water quality data submitted in the report.
 - b. For each monitoring well addressed by the report, a description of the method and time of water level measurement, the type of pump used for **purgings** and the placement of the pump in the well, and the method of purging (pumping rate, equipment and methods used to monitor field pH, temperature, and conductivity during purging, calibration of the field equipment, results of pH,

- temperature, conductivity, and turbidity testing, well recovery time, and method of purge water disposal).
- c. For each Monitoring Point and Background Monitoring Point addressed by the report, a description of the type of pump (or other device) used and its placement for **sampling**, and a detailed description of the sampling procedure (number and description of the samples, field blanks, travel blanks, and duplicate samples taken, the type of containers and preservatives used, the date and time of sampling, the name and qualifications of the person actually taking the samples, and any other observations).
 - d. A **map or aerial photograph** showing the locations of observation stations, Monitoring Points, and Background Monitoring Points.
 - e. **Laboratory** statements of results of all analyses evaluating compliance with requirements.
 - f. An evaluation of the effectiveness of the leachate monitoring and control facilities, and of the run-off/run-on control facilities.
 - g. A summary and certification of completion of all Standard Observations for the WMU, for the perimeter of the WMU, and for the receiving waters. The terms 'Standard Observations' and 'receiving waters' as used in this document are defined below in section **XII. Definitions**.
 - h. The quantity and types of wastes discharged and the locations in the WMU where waste has been placed since submittal of the last such report.
3. The Discharger shall report by telephone concerning any **seepage from the disposal area** immediately after it is discovered. A written report shall be filed with the Central Valley Water Board within seven days, containing at least the following information:
 - a. a map showing the location(s) of seepage;
 - b. an estimate of the flow rate;

- c. description of the nature of the discharge (e.g., all pertinent observations and analyses); and
- d. corrective measures underway or proposed, and corresponding time schedule.

See **RESPONSE TO A RELEASE** below.

- 4. The Discharger shall submit an **Annual Monitoring Summary Report** to the Central Valley Water Board summarizing the monitoring results from the previous year. This report shall contain:
 - a. For each Monitoring Point and Background Monitoring Point, submit in **graphical format** the laboratory analytical data for all samples taken within at least the previous five calendar years. Each such graph shall plot the concentration of one or more constituents for the period of record for a given Monitoring Point or Background Monitoring Point, at a scale appropriate to show trends or variations in water quality. The graphs shall plot each datum, rather than plotting mean values. For any given constituent or parameter, the scale for background plots shall be the same as that used to plot downgradient data. Graphical analysis of monitoring data may be used to provide significant evidence of a release.
 - b. Unless otherwise exempted by the Executive Officer, all monitoring analytical data obtained during the previous two six-month Reporting Periods, presented in tabular form as well as on computer disk, either in EXCEL format or in another file format acceptable to Central Valley Water Board staff. Data may be submitted in commonly available compressed format. The Central Valley Water Board regards the submittal of data in hard copy and electronic format as "...the form necessary for..." statistical analysis (27 CCR §20420(h)), in that this facilitates periodic review by the Central Valley Water Board's statistical consultant.
 - c. **A comprehensive discussion of the compliance record**, and the result of any corrective actions taken or planned which may be needed to bring the Discharger into full compliance with the waste discharge requirements.

- d. A **map** showing the area and elevations in which filling has been completed during the previous calendar year.
- e. A **written** summary of the monitoring results, indicating any changes made or observed since the previous annual report.
- f. An evaluation of the effectiveness of the leachate monitoring/control facilities.

IX. PROVISIONS FOR MONITORING

A. General

1. The Discharger shall maintain a **written sampling and analysis plan** sufficient to assure compliance with the terms of this Order. Anyone performing sampling on behalf of the Discharger shall be familiar with the sampling and analysis plan.
2. All monitoring instruments and devices used by the Discharger to fulfill the prescribed monitoring program shall be properly maintained and regularly **calibrated** to ensure their continued accuracy.
3. The Discharger shall construct or abandon all **monitoring wells** to meet or exceed the standards stated in the State Department of Water Resources Bulletin 74-81 and subsequent revisions, and shall comply with the reporting provisions for wells required by Water Code Sections 13750 through 13755.
4. All sample analyses shall be conducted at a **laboratory accredited** for such analyses by the State Department of Health Services. The **Quality Assurance-Quality Control Program** must conform to EPA guidelines (e.g., "Laboratory Documentation Requirements for Data Validation," January 1990, USEPA Region 9) or to procedures approved by the Central Valley Water Board.
5. The director **of the laboratory** whose name appears on the certification shall supervise all analytical work in his/her laboratory and shall sign all reports of such work submitted to the Central Valley Water Board.
6. Unless samples are from water supply wells or unless otherwise specified by Central Valley Water Board staff, all ground water samples to be analyzed for **metals** shall be field-filtered.

Filtration methods shall minimize the entrainment of air into the sample (by using, for example, in-line pressure filtration).

B. Sampling and Analytical Methods

1. For any given monitored medium, the samples taken from all monitoring points and background monitoring points to satisfy the data analysis requirements for a given reporting period shall all be taken within a span not to exceed 30 days, unless the Executive Officer approves a longer time period, and shall be taken in a manner that ensures sample independence to the greatest extent feasible. Specific methods of collection and analysis must be identified. Sample collection, storage, and analysis shall be performed according to the most recent version of USEPA Methods, such as the latest editions, as applicable, of: (1) Methods for the Analysis of Organics in Water and Wastewater (USEPA 600 Series), (2) Test Methods for Evaluating Solid Waste (SW-846, latest edition), and (3) Methods for Chemical Analysis of Water and Wastes (USEPA 600/4-79-020), and in accordance with the approved Sample Collection and Analysis Plan.
2. If methods other than USEPA-approved methods or Standard Methods are used, the exact methodology shall be submitted for review and approval by the Executive Officer prior to use.
3. The **methods of analysis and the detection limits** used must be appropriate for the expected concentrations. For the monitoring of any constituent or parameter that is found in concentrations which produce more than 90% non-numerical determinations (i.e., "trace" or "ND") in data from background monitoring points for that medium, the analytical method having the lowest MDL shall be selected from among those methods which would provide valid results in light of any matrix effects or interferences.
4. **"Trace" results** - results falling between the MDL and the PQL - shall be reported as such, and shall be accompanied by both the estimated MDL and PQL values for that analytical run.
5. **MDLs and PQLs** shall be derived by the laboratory for each analytical procedure, according to State of California laboratory accreditation procedures. These MDLs and PQLs shall reflect the detection and quantitation capabilities of the specific analytical procedure and equipment used by the lab, rather than

simply being quoted from USEPA analytical method manuals. In relatively interference-free water, laboratory-derived MDLs and PQLs are expected to closely agree with published USEPA MDLs and PQLs.

6. If the laboratory suspects that, due to a change in matrix or other effects, the true detection limit or quantitation limit for a particular analytical run differs significantly from the laboratory-derived MDL/PQL values, the results shall be flagged accordingly, along with estimates of the detection limit and quantitation limit actually achieved. **The MDL shall always be calculated such that it represents the lowest achievable concentration associated with a 99% reliability of a nonzero result.** The PQL shall always be calculated such that it represents the lowest constituent concentration at which a numerical value can be assigned with reasonable certainty that it represents the constituent's actual concentration in the sample. Normally, PQLs should be set equal to the concentration of the lowest standard used to calibrate the analytical procedure.
7. Unknown chromatographic peaks shall be reported, along with an estimate of the concentration of the unknown analyte. When unknown peaks are encountered, second column or second method confirmation procedures shall be performed to attempt to identify and more accurately quantify the unknown analyte.
8. All **QA/QC data** shall be reported, along with the sample results to which they apply, including the method, equipment, analytical detection and quantitation limits, the percent recovery, an explanation for any recovery that falls outside the QC limits, the results of equipment and method blanks, the results of spiked and surrogate samples, the frequency of quality control analysis, and the name and qualifications of the person(s) performing the analyses. Sample results shall be reported unadjusted for blank results or spike recoveries. In cases where contaminants are detected in QA/QC samples (i.e., field, trip, or lab blanks), the accompanying sample results shall be appropriately flagged.
9. The statistical method shall account for data below the PQL with one or more statistical procedures that are protective of human health and the environment. Any PQL validated pursuant to §20415(e)(7) of Title 27 that is used in the statistical method shall be **the lowest concentration (or value) that can be reliably achieved** within limits of precision and accuracy specified in the WDRs for routine laboratory operating conditions that are

available to the facility. The Discharger's technical report, pursuant to §20415(e)(7) of Title 27, shall consider the PQLs listed in Appendix IX to Chapter 14 of Division 4.5 of Title 22, California Code of Regulations, for guidance when specifying limits of precision and accuracy. For any given constituent monitored at a background or downgradient monitoring point, an indication that falls between the MDL and the PQL for that constituent (hereinafter called a "trace" detection) shall be identified and used in appropriate statistical or nonstatistical tests. Nevertheless, for a statistical method that is compatible with the proportion of censored data (trace and ND indications) in the data set, the Discharger can use the laboratory's concentration estimates in the trace range (if available) for statistical analysis, in order to increase the statistical power by decreasing the number of "ties".

10. Background for water samples shall be represented by the data from all samples taken from applicable background monitoring points during that reporting period (at least one sample from each background monitoring point). The Discharger may propose an alternate statistical method [to the methods listed under 27 CCR §20415(e)(8)(A-D)] in accordance with §20415(e)(8)(E) of Title 27, for review and approval by the Executive Officer.
11. The Discharger may propose an alternate statistical method [to the methods listed under title 27 section 20415(e)(8)(A-D)] in accordance with title 27 section 20415(e)(8)(E), for review and approval by the Executive Officer. Upon receiving written approval, alternate statistical procedures may be used for determining the significance of analytical results for common laboratory contaminants (i.e., methylene chloride, acetone, diethylhexyl phthalate, and di-n-octyl phthalate). Nevertheless, analytical results involving detection of these analytes in any background or downgradient sample shall be reported and flagged for easy reference by Central Valley Water Board staff.
12. The Discharger shall use the following non-statistical method for all analytes that are detected in less than 10% of the background samples. The non-statistical method shall be implemented as follows:
 - a. From the constituent of concern or monitoring parameter list, identify each analyte in the **current** sample that exceeds either its respective MDL or PQL. The Discharger shall conclude that the exceedance provides a preliminary

indication of a release or a change in the nature or extent of the release, at that monitoring point, if **either**:

- i. The data contains two or more analytes that are detected in less than 10% of background samples that equal or exceed their respective MDLs; or
 - ii. The data contains one or more analyte that equals or exceeds its PQL.
- b. **Discrete Retest** [27 CCR §20415(e)(8)(E)]:
- i. In the event that the Discharger concludes (pursuant to paragraph 12.a., above) that there is a preliminary indication of a release, then the Discharger shall immediately notify Central Valley Water Board staff by phone or e-mail and, within 30 days of such indication, shall collect two new (retest) samples from the monitoring point where the release is preliminarily indicated.
 - ii. For any given retest sample, the Discharger shall include, in the retest analysis, **only the laboratory analytical results for those analytes detected in the original sample**. As soon as the retest data are available, the Discharger shall conclude that there is measurably significant evidence of a release if two or more analytes equal or exceed their respective MDLs or if one or more analyte equals or exceeds its PQL and shall:
 - a. **Immediately** notify the Central Valley Water Board about any constituent or constituents verified to be present at the monitoring point, and follow up with written notification submitted by certified mail **within seven days** of validation; and
 - b. Comply with section **IX.B.14** of this document, **Sampling and Analytical Methods**, if any constituent or constituents were verified to be present.
 - iii. Any analyte that triggers a discrete retest per this method shall be added to the monitoring parameter list

such that it is monitored during each regular monitoring event.

13. If the Executive Officer determines, after reviewing the submitted report in 12.b. above, that the detected constituent most likely originated from the WMU(s), the Discharger shall **immediately** implement the requirements of section **X.C., Release Has Been Verified**, of this document.
14. If the Discharger determines that there is measurably significant evidence of a release from the WMU at any monitoring point, the Discharger shall **immediately** implement the requirements of section **X.C., Release Has Been Verified**, of this document.

X. RESPONSE TO A RELEASE

A. Monitoring Point Evidence of a Release

If the Discharger determines that there is “measurably significant” evidence of a release from the WMU (i.e. the initial statistical comparison or nonstatistical comparison indicates, for any constituent of concern or monitoring parameter, that a release is tentatively identified), the Discharger shall [27 CCR §20420(j)]:

- a. **Notification — immediately notify Central Valley Water Board staff verbally** of the finding and **provide** written notification by certified mail **within seven days** of such determination. The notification shall, for each affected monitoring point, identify the monitoring parameters and constituents of concern that have indicated “measurably significant” evidence of a release from the WMU [27 CCR §20420(j)(1)];
- b. **Retest Optional** — can immediately initiate the verification (retest) procedure pre-approved by the Central Valley Water Board [pursuant to §20415(e)(8)(E) of Title 27] to verify that there is “measurably significant” evidence of a release from the WMU for a parameter or constituent which has indicated a release at a monitoring point [27 CCR §20420(j)(2)]; and

- c. **Next Step** — immediately following detection of a release [or after completing the retest pursuant to b) above and confirming the existence of a release], shall comply with the requirements of C. (Release Has Been Verified) below [27 CCR §20420(j)(3)].

B. **Physical Evidence of a Release**

If the Discharger determines there is significant **physical** evidence of a release, the Discharger shall notify the Central Valley Water Board **by certified mail within 7 days** of such determination, and within 90 days shall submit an amended report of waste discharge to make any appropriate changes to the detection monitoring program [27 CCR §20420(l)(1) & (2)].

C. **Release Has Been Verified**

1. If the detection was made based upon sampling and analysis for monitoring parameters, **immediately** sample all monitoring points in the affected medium at that WMU and determine the concentration of all constituents of concern. Because this constituent of concern scan does not involve statistical testing, the Discharger need collect and analyze only a single water sample from each monitoring point in the affected medium [27 CCR §20420(k)(1)].
2. The Discharger, **within 90 days** of determining “measurably significant” evidence of a release, shall submit an amended report of waste discharge to establish an evaluation monitoring program meeting the requirements of §20425 of Title 27 [27 CCR §20420(k)(5)].
3. The Discharger, **within 180 days** of determining “measurably significant” evidence of a release, shall submit to the Central Valley Water Board an initial engineering feasibility study for a corrective action program necessary to meet the requirements of §20430 of Title 27. At a minimum, the engineering feasibility study shall contain a detailed description of the corrective action measures that could be taken to achieve background concentrations for all constituents of concern [27 CCR §20420(k)(6)].
4. If the Discharger determines that there is “measurably significant” evidence of a release from the WMU at any monitoring point, the Discharger may demonstrate that a source other than the WMU

caused the evidence of a release or that the evidence is an artifact caused by an error in sampling, analysis, or statistical evaluation or by natural variation in groundwater, surface water, or the unsaturated zone. The Discharger may make a demonstration pursuant to §20420(k)(7) of Title 27 in addition to or in lieu of submitting both an amended report of waste discharge or an engineering feasibility study; however, the Discharger is not relieved of the requirements of §20420(k)(6) & (7) of Title 27 unless the demonstration successfully shows that a source other than the WMU caused the evidence of a release or that the evidence resulted from error in sampling, analysis, or statistical evaluation or from natural variation in groundwater, surface water, or the unsaturated zone. In making this demonstration, the Discharger shall notify the Central Valley Water Board by certified mail of the intent to make the demonstration **within seven days** of determining “measurably significant” evidence of a release. The report shall be submitted to the Central Valley Water Board **within 90 days** of determining “measurably significant” evidence of a release demonstrating that a source other than the WMU caused the evidence [27 CCR §20420(k)(7)].

5. The Discharger, **within 90 days** of establishing an Evaluation Monitoring Program, shall conduct an evaluation monitoring program to assess the nature and extent of the release from the WMU and to design a corrective action program meeting the requirements of §20430 of Title 27. At a minimum, an evaluation monitoring program for a WMU shall include:
 - a. An assessment of the nature and extent of the release from the WMU. This assessment shall include a determination of the distribution and concentration of each constituent of concern throughout the zone affected by the release. The Discharger shall submit this assessment to the Central Valley Water Board **within 90 days** of establishing an evaluation monitoring program [27 CCR §20425(b)].
 - b. Update the initial engineering feasibility study for corrective action based on the data collected to delineate the release and from the ongoing monitoring program. The Discharger shall submit this updated engineering feasibility study to the Central Valley Water Board **within 90 days** of establishing an evaluation monitoring program [27 CCR §20425(c)].

- c. Submit an amended report of waste discharge to establish a corrective action program meeting the requirements of §20430 of Title 27 based on the data collected to delineate the release and on the updated engineering feasibility study. The Discharger shall submit this report to the Central Valley Water Board **within 90 days** of establishing an evaluation monitoring program [27 CCR §20425(d)].

D. **Release Beyond Facility Boundary**

1. Any time the Discharger concludes that a release from the WMU has proceeded beyond the facility boundary, the Discharger shall so notify all persons who either own or reside upon the land that directly overlies any part of the plume (Affected Persons).
2. Initial notification to Affected Persons shall be accomplished within 14 days of making this conclusion and shall include a description of the Discharger's current knowledge of the nature and extent of the release.
3. Subsequent to initial notification, the Discharger shall provide updates to all Affected Persons, including any persons newly affected by a change in the boundary of the release, within 14 days of concluding there has been any material change in the nature or extent of the release.
4. Each time the Discharger sends a notification to Affected Persons, the Discharger shall provide the Central Valley Water Board, within seven days of sending such notification, with both a copy of the notification and a current mailing list of Affected Persons.

XI. **STANDARD CONDITIONS**

A. **Supervision and Certification**

1. All WMUs shall be **designed and constructed** under the direct supervision of a California registered civil engineer or a certified engineering geologist, as appropriate, and shall be certified by that individual as meeting the prescriptive standards, or approved engineered alternative design, and performance goals of Title 27 prior to waste discharge.
2. Designs of WMUs shall include a **Construction Quality Assurance Plan**, which shall:

- a. be submitted for review and approval by the Central Valley Water Board prior to construction;
 - b. demonstrate that the WMU has been constructed according to the specifications and plans as approved by the Central Valley Water Board; and
 - c. provide quality control on the materials and construction practices used to construct the WMU and prevent the use of inferior products and/or materials which do not meet the approved design plans or specifications.
3. **Closure** of each WMU shall be performed under the direct supervision of a California registered civil engineer or California certified engineering geologist.

B. Operations

1. The Discharger shall maintain in **good working order** and operate as efficiently as possible any facility, control system, or monitoring device installed to achieve compliance with the waste discharge requirements.
2. For any **electrically** operated equipment at the site, the **failure** of which could cause loss of control or containment of waste materials, or violation of this Order, the Discharger shall employ safeguards to prevent loss of control over wastes. Such safeguards may include alternate power sources, standby generators, retention capacity, operating procedures, or other means.
3. The fact that it would have been necessary to halt or reduce the permitted activity in Order to maintain compliance with this Order shall not be regarded as a defense for the Discharger's violations of the Order.
4. The discharge shall remain within the designated disposal area at all times.
5. By the effective date of waste discharge requirements, the Discharger shall have a plan for preventing and controlling **accidental discharges**, and for minimizing the effect of such events. This plan shall:

- a. Identify the possible sources of accidental loss or leakage of wastes from each waste storage, treatment, or disposal unit.
- b. Evaluate the effectiveness of present WMUs and operational procedures, and identify needed changes or contingency plans.
- c. Predict the effectiveness of the proposed changes in waste management facilities and procedures and provide an implementation schedule containing interim and final dates when changes will be implemented.

The Central Valley Water Board, after review of the plan, may establish conditions that it deems necessary to control leakage and minimize its effects.

6. Any direct-line discharge to a surface impoundment shall have fail-safe equipment or operating procedures to prevent overflowing.
7. Surface impoundments shall be designed, constructed and maintained to prevent scouring and/or erosion of the liners and other containment features at points of discharge to the impoundments and by wave action at the waterline.
8. Leachate removed from a surface impoundment LCRS shall be discharged to the impoundment from which it originated.
9. Solids which accumulate in a surface impoundment shall be periodically removed to maintain minimum freeboard requirements and to maintain sufficient capacity for the surface impoundment leachate and for the discharge of wastes. Prior to removal of these solids, sufficient samples shall be taken for their characterization and classification pursuant to Article 2, Subchapter 2 of Title 27. The rationale for the sampling protocol used, the results of this sampling, and a rationale for classification of the solids shall be submitted to the Central Valley Water Board for review. The solids will be discharged to an appropriate WMU based on characterization.
10. Water used for facility maintenance shall be limited to the minimum amount necessary for dust control.

C. Siting

1. New WMUs for Group A and B wastes shall not be located on Holocene faults. Units for Group C wastes may be located on Holocene faults if displacement will not allow escape of wastes or cause irreparable damage to containment structures [27 CCR §22490(a)(1)].
2. New WMUs shall be outside areas of rapid geologic change. Exemptions may be allowed by the RWQCB if containment structures are designed and constructed to preclude failure [27 CCR §22490(a)(2)].
3. Surface drainage from tributary areas and internal site drainage from surface or subsurface sources shall not contact or percolate through wastes, and shall either be contained on-site or be discharged in accordance with applicable storm water regulations.

D. Closure

1. New and existing WMUs shall be closed so that they no longer pose a threat to water quality. No post closure land uses shall be permitted that might impair the integrity of containment structures [27 CCR §22510(a)].
2. WMUs shall be closed according to an approved closure and post closure maintenance plan which provides for continued compliance with applicable standards for waste containment, precipitation and drainage controls and monitoring throughout closure and the post closure maintenance period [27 CCR §22510(b)].
3. Closed WMUs shall be provided with at least two **permanent monuments**, installed by a licensed land surveyor or by a registered civil engineer authorized to perform land surveying, from which the location and elevation of all wastes, containment structures, and monitoring facilities can be determined throughout the post-closure maintenance period [27 CCR §20950(d)].
4. Final cover slopes for Group A and Group B waste piles shall not be steeper than a horizontal to vertical ratio of one and three quarters to one, and shall have minimum of one fifteen-foot wide bench for every fifty feet of vertical height [27 CCR §21090(a)].

E. Post-Closure

1. WMUs shall be closed so that they no longer pose a threat to water quality. No post closure land uses shall be permitted that might impair the integrity of containment structures [27 CCR §22510(a)].
2. The post-closure maintenance period shall end when the Central Valley Water Board determines that water quality aspects of reclamation are complete and waste no longer poses a threat to water quality [27 CCR §22510(h)].
3. The owner of the mine shall have the continuing responsibility to assure protection of usable waters from discharged wastes and from gases and leachate generated by discharged waste during the active life, closure, and post-closure maintenance period of the WMUs and during subsequent use of the property for other purposes.

XII. DEFINITIONS

Unless otherwise stated, all terms are as defined in Chapter 2, Division 7, of the California Water Code (Section 13050 et.seq.), in Article 2, Chapter 2, Division 2, Title 27 of the California Code of Regulations (27 CCR §20005 et seq.), and in Section 258.2, and elsewhere in Part 258, Title 40 of the Code of Federal Regulations.

The following additional definitions apply to the Order:

- A. **“Affected Persons”** means all individuals who either own or occupy land outside the boundaries of the parcel upon which the WMU is located that has been or may be affected by the **release** of leachate or waste constituents (in gas or liquid phase) from a WMU.
- B. **“Background Monitoring Point”** means a device (e.g., well) or location (e.g., a specific point along a lakeshore), upgradient or sidegradient from the WMU, or as otherwise approved by the Executive Officer, where water quality samples are taken that are not affected by any release from the WMU and that are used as a basis of comparison against samples taken from downgradient Monitoring Points.
- C. **“Composite liner”** means a liner that consists of two or more components, which include a Synthetic Liner in direct and uniform contact with an underlying layer of prepared, low-permeability soil such that the net permeability of the resulting combination is significantly less

than would be expected by reference to the permeability of the individual components layers.

- D. Unless otherwise specified, “**composite sample**” means a combination of individual samples either collected over a specified sampling period or collected over an area at one time (synoptically):
1. at equal time intervals,
 2. at varying time intervals so that each sample represents an equal portion of the media to be sampled.

The duration of the sampling period shall be specified in the Monitoring and Reporting Program. The method of compositing shall be reported with the results. “**Constituents of Concern (COC)**” means those constituents which are likely to be in the waste in the WMU or which are likely to be derived from waste constituents in the event of a release.

- E. “**Daily maximum concentration**” means the highest measurement made on any single discrete sample or composite sample.
- F. “**Grab sample**” means a discrete sample collected in less than 15 minutes.
- G. “**Matrix effect**” means any change in the method detection limit or practical quantitation limit for a given analyte as a result of the presence of other constituents - either of natural origin or introduced **by** humans as a result of a release or spill - that are present in the sample of water or soil-pore gas being analyzed.
- H. “**Method detection limit (MDL)**” means the lowest constituent concentration associated with a 99% reliability of a “non-zero” analytical result. The MDL shall reflect the detection capabilities of the specific analytical procedure and equipment used by the laboratory. MDLs reported by the laboratory shall not simply be restated from USEPA analytical method manuals. In relatively interference-free water, laboratory-derived MDLs are expected to closely agree with published USEPA MDLs. If the lab suspects that, due to matrix or other effects, the detection limit for a particular analytical run differs significantly from the laboratory-derived MDL, the results should be flagged accordingly, along with an estimate of the detection limit achieved.
- I. “**Monitoring Parameters**” means the short list of constituents and parameters used for the majority of monitoring activity at a given WMU. Monitoring for the short list of Monitoring Parameters constitutes

“indirect monitoring,” in that the results are used to indicate indirectly the success or failure of adequate containment for the longer list of Constituents of Concern.

- J. **“Monitored Media”** means those water-, solid-, or gas-bearing media that are monitored pursuant to the Monitoring and Reporting Program. The Monitored Media may include:
1. Ground water in the uppermost aquifer, in any other portion of the zone of saturation in which it would be reasonable to anticipate that waste constituents migrating from the WMU could be detected, and in any perched zones underlying the WMU,
 2. Any bodies of surface water that could be measurably affected by a release,
 3. Soil pore liquid beneath and/or adjacent to the WMU, and
 4. Soil pore gas beneath and/or adjacent to the WMU.
- K. **“Monitoring Point”** means a device (e.g., well) or location (e.g., a specific point along a lakeshore), downgradient from the WMU and that is assigned in this Order, at which samples are collected for the purpose of detecting a release by comparison with samples collected at Background Monitoring Points.
- L. **“Monthly average concentration”** means the arithmetic mean of measurements made during the month.
- M. **“Monthly average discharge”** means the total discharge by volume during a calendar month divided by the number of days in the month that the facility was discharging (e.g. gallons per day, cubic feet per day).
- Where less than daily sampling is required by this Order, the monthly average shall be determined by the summation of all the measured discharges divided by the number of days during the month when the measurements were made.
- N. **“Order,”** as used throughout this document, means the Waste Discharge Requirements. The Monitoring and Reporting Program and Standard Provisions and Reporting Requirements are incorporated by reference into the Waste Discharge Requirements.
- O. **“Practical quantitation limit (PQL)”** means the lowest constituent concentration at which a numerical concentration can be assigned with

reasonable certainty that its value represents the constituent's actual concentration in the sample. Normally PQLs should be set equal to the concentration of the lowest standard used to calibrate the analytical procedure. The PQL shall reflect the quantitation capabilities of the specific analytical procedure and equipment used by the laboratory. PQLs reported by the laboratory shall not simply be restated from U.S. EPA analytical method manuals. In relatively interference-free water, laboratory-derived PQLs are expected to closely agree with published U. S. EPA PQLs. If the lab suspects that, due to matrix or other effects, the quantitation limit for a particular analytical run differs significantly from the laboratory-derived PQL, the results should be flagged accordingly, along with an estimate of the quantitation limit achieved.

- P. **"Reporting Period"** means the time interval during which samples are collected and analyzed, and the results then reported to the Central Valley Water Board, to comply with a specified monitoring and reporting frequency. The maximum reporting period for analysis of all Constituents of Concern is five years; for Monitoring Parameters it is six months (generally, Spring/Summer = April 1 to September 30, and Fall/Winter = October 1 to March 31). The Reporting Period for the Annual Summary Report extends from April 1 of the previous year to March 31 of the current year. The due date for the submittal of any given report will be 15 days after the end of its Reporting Period, unless otherwise stated.
- Q. **"Receiving Waters"** refers to any surface or ground water which actually or potentially receives waste constituents, leachate, or surface or ground waters which come in contact with waste materials or contaminated soils.
- R. **"Sample size"**:
1. For Monitoring Points, means the number of data points obtained from a given Monitoring Point during a given Reporting Period used for carrying out the statistical or non-statistical analysis of a given analyte during a given Reporting Period; or
 2. For Background Monitoring Points, means the number of new and existing data points collected under §20415(e)(11 and 12) from all applicable Background Monitoring Points in a given monitored medium—used to collectively represent the background concentration and variability of a given analyte in carrying out statistical or non-statistical analysis of that analyte during a given Reporting Period.

S. **“Standard Observations”** means:

1. For Receiving Waters:
 - a. Floating and suspended materials of waste origin: presence or absence, source, and size of affected area;
 - b. Discoloration and turbidity: description of color, source, and size of affected area;
 - c. Evidence of odors: presence or absence, characterization, source, and distance of travel from source;
 - d. Evidence of water uses: presence of water-associated wildlife;
 - e. Flow rate; and
 - f. Weather conditions: wind direction and estimated velocity, total precipitation during recent days and on the day of observation;
2. Along the perimeter of the WMU:
 - a. Evidence of liquid leaving or entering the WMU, estimated size of affected area, and flow rate (show affected area on map);
 - b. Evidence of odors: presence or absence, characterization, source, and distance of travel from source; and
 - c. Evidence of erosion and/or of daylighted refuse.
3. For the WMU:
 - a. Evidence of ponded water at any point on the waste management facility (show affected area on map);
 - b. Evidence of odors: presence or absence, characterization, source, and distance of travel from source;
 - c. Evidence of erosion and/or of daylighted refuse; and

T. **“Standard Analysis and Measurements”** means:

1. Turbidity, in NTU;

2. Water elevation to the nearest 1/100th foot above mean sea level; and
 3. Sampling and statistical/non-statistical analysis of the Monitoring Parameters.
- U. “**Synthetic Liner**” means a layer of flexible, man-made material that is installed in accordance with the standard of the industry over an area of land prior to the discharge of waste there.
- V. “**VOC_{water}**” (Volatile Organics Monitoring Parameter for Water) means the composite monitoring parameter encompassing all VOCs that are detectable in less than ten percent of applicable background samples from a monitored water-bearing medium (e.g., the unsaturated zone, the uppermost aquifer, a zone of perched groundwater, or a surface water body). This parameter is analyzed via the non-statistical analytical method described elsewhere in this Order to identify a release to waters of the state of VOCs whose presence in background water is detected too infrequently to allow statistical analysis.
- W. “**VOC_{spg}**” (Volatile Organics Monitoring Parameter for Soil Pore Gas) means Monitoring Parameters addressing all volatile organic constituents detectable in a sample of soil pore gas.
- X. “**Volatile organic constituents (VOCs)**” means the suite of organic constituents having a high vapor pressure. The term includes at least the 47 organic constituents listed in Appendix I to 40 CFR Part 258.



California Regional Water Quality Control Board Central Valley Region

Karl E. Longley, ScD, P.E., Chair



Edmund G. Brown Jr.
Governor

Matthew Rodriguez
*Secretary for
Environmental Protection*

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(916) 464-3291 • FAX (916) 464-4645
<http://www.waterboards.ca.gov/centralvalley>

10 February 2012

Scott Moore
Homestake Mining Company of California
26775 Morgan Valley Road
Lower Lake, CA 95457

CERTIFIED MAIL
7011 2970 0003 5615 9949

NOTICE OF ADOPTION
OF
WASTE DISCHARGE REQUIREMENTS
FOR
HOMESTAKE MINING COMPANY OF CALIFORNIA
FOR
CLOSURE AND POST-CLOSURE MAINTENANCE OF
McLAUGHLIN MINE
LAKE, NAPA AND YOLO COUNTIES

Waste Discharge Requirements (WDRs) Order No. R5-2012-0010 for the McLaughlin Mine was adopted by the California Regional Water Quality Control Board, Central Valley Region, at its 2 February 2012 meeting. This Order prescribes requirements for closure and post-closure maintenance of mining waste management units at the former McLaughlin Gold Mine. A copy of the Order must be maintained at the facility. A copy of this Order should also be placed in the landfills operating record.

Please review your WDRs carefully to ensure you understand all aspects of the discharge requirements. Please note that the Reporting Requirements section of the WDRs requires submittal of certain technical reports by the dates provided in the Order. These submittals include the items listed on the following table.

REQUIREMENT	DUE DATE
WRF Alternative sample locations	1 June 2012
Annual TIF Closure Construction Plan	1 May each year
Annual status of TIF Closure	30 July of each year
Annual Update Status of Financial Assurance	30 April of each year
Final TIF Closure Report	60 days after completion
	No later than 2 March 2022

In addition to technical reports required by the WDRs, the WDRs contain a Monitoring and Reporting Program (MRP), which contains specified monitoring requirements that you must implement. Please review the MRP closely so that you may establish the appropriate sampling schedules and protocols. The MRP requires the following technical reports:

REQUIREMENT

Semiannual Monitoring Reports
Annual Monitoring Report
Annual Facility Monitoring Report

DUE DATE

30 July & 30 January each year
30 July each year
30 September of each year

Your first semi-annual monitoring report is due by **30 July 2012**, and is to cover the period from 1 January to 30 June.

To conserve paper and reduce mailing costs, a paper copy of the order has been sent only to the Discharger. Interested parties are advised that the full text of this order is available at: http://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/. Anyone without access to the Internet who needs a paper copy of the order can obtain one by calling Central Valley Water Board staff.

All compliance and enforcement questions should be directed to Ross Atkinson. Mr. Atkinson can be reached at (916) 464-4614 or ratkinson@waterboards.ca.gov. Additionally; all technical reports and monitoring reports should be submitted to the attention of Mr. Atkinson.

If you have any questions regarding submitting an updated report of waste discharge, or questions about making any changes to your permitted operations contact Ross Atkinson at (916) 464-4614 or at ratkinson@waterboards.ca.gov.

VICTOR IZZO

Senior Engineering Geologist

Enclosures - Adopted Waste Discharge Requirements
Standard Provisions and Reporting Requirements

cc on following page

cc w/o enclosures:

Division of Water Quality, State Water Resources Control Board, Sacramento
Patrick Palupa, Office of the Chief Counsel, SWRCB, Sacramento
Office of Drinking Water, Department of Health Services, Sacramento
Environmental Mgmt. Branch, Department of Health Services, Sacramento
Department of Fish and Game, Region II, Rancho Cordova
Ken Trott, Environmental Program Manager, Dept. of Conservation, Sacramento
Stephen Testa, EO, State Mining and Geology Board, Sacramento
Joshua Goodwin, Dept. of Conservation, Sacramento
Hillary Gitelman, Napa County Conservation, Development and Planning, Napa
Ray Ruminski, Lake County Dept. of Environmental Health, Lakeport
Yolo County Planning Department, Woodland
Edward B. Grandy, Homestake Mining Co. of California, Salt Lake City, UT
Paul Aigner, UC Davis, Donald and Sylvia McLaughlin Reserve, Lower Lake
Wayne Whitlock, Pillsbury Winthrop Shaw Pittmen, Palo Alto
Ken Haskell, Golder Associates Inc., Roseville
Lake County Record-Bee, Lakeport