

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. R5-2007-0124

WASTE DISCHARGE REQUIREMENTS
FOR
SYNAGRO WEST, LLC AND GARY SILVA
SILVA RANCH WET WEATHER BIOSOLIDS STORAGE FACILITY
CLASS II WASTE PILE AND CLASS II SURFACE IMPOUNDMENT
CONSTRUCTION, OPERATION, AND CLOSURE
SACRAMENTO COUNTY

The California Regional Water Quality Control Board, Central Valley Region, (hereafter Regional Water Board) finds that:

1. Synagro West, LLC (facility owner and operator) and Gary Silva (landowner), hereafter referred to jointly as Discharger, propose to construct and operate a Class II waste pile and Class II surface impoundment at the Silva Ranch for wet weather storage of biosolids. The Silva Ranch is a 2,800-acre property used for pasturing and growing crops for a variety of animals. Municipal biosolids are accepted at the ranch and applied to land.
2. Waste Discharge Requirements (WDRs) Order No. 95-064, WDRs Order No. 98-023, and Monitoring and Reporting Program (MRP) No. R5-2007-0807 were adopted by the Regional Water Board to regulate biosolids application to land at separate areas of the Silva Ranch designated as Silva I and Silva II. These Orders remain in effect until revised or rescinded. This companion Order regulates the storage of biosolids during the wet season and is necessary since WDRs 95-064 and 98-023 do not allow biosolids to be applied to land during periods of wet weather.
3. The Silva Ranch Wet Weather Biosolids Storage Facility (the facility) is located approximately two miles northeast of Clay Station Road and Twin Cities Road in Sacramento County. This property is described by Assessor's Parcel Numbers 136-0280-023, 138-0060-028, 140-0030-014, 140-0030-015, and 140-0050-021 in Section 19, T6N, R7E, MDB&M. The facility location is shown on Attachment A, which is incorporated herein and made a part of this Order by reference.
4. The Discharger submitted a Report of Waste Discharge (RWD) application for waste discharge requirements dated 15 June 2007 for a proposed Class II waste pile and surface impoundment with an engineered alternative to a prescriptive liner. The RWD application followed the previously submitted report dated 8 January 2007 entitled *Construction Workplan* for the facility. Amendments to the work plan dated 1 May 2007 were submitted on 22 June 2007. The amended work plan includes information necessary for the technical report portion of the RWD including, but not limited to, the proposed design for the liner systems, preliminary closure and postclosure maintenance plans, financial assurances cost estimates, construction quality assurance plans for liner construction and facility clean

closure, final design drawings and technical specifications for liner installation, an operations plan, sampling procedures, an emergency response plan, and a facility monitoring plan. This Order approves each of the plans.

5. The proposed Class II waste pile will be used to store up to 32,000 cubic yards of municipal biosolids during wet weather or wet soil conditions. The proposed Class II surface impoundment will be constructed at the lowest end of the waste pile to capture and store storm water runoff from the storage area. The waste management units will be constructed at the site of an existing area that has been used previously for storage of biosolids. The existing facility is as shown on Attachment B, which is incorporated herein and made a part of this Order by reference.

WASTE AND WASTE MANAGEMENT UNIT CLASSIFICATION

6. The State Water Resources Control Board (State Water Board) adopted regulations under Title 27 of the California Code of Regulations (Title 27 CCR), consisting of requirements, waste classifications, and waste management unit classifications designed to protect the beneficial uses of waters of the state for projects involving the discharge of designated waste to land for treatment, storage, or disposal.
7. California Water Code §13173(b) defines "designated waste" to include "[n]on hazardous waste that consists of, or contains, pollutants that, under ambient environmental conditions at a waste management unit, could be released in concentrations that exceed applicable water quality objectives or that could reasonably be expected to affect beneficial uses of waters of the state as contained in the appropriate state water quality control plan."
8. Municipal biosolids and storm water runoff from areas containing municipal biosolids contain salts, nitrates, and metals at concentrations that could be released in concentrations that exceed applicable water quality objectives, and could reasonably be expected to affect beneficial uses of underlying groundwater when concentrated and stored at one location for extended periods. Therefore, they are considered a designated waste when stockpiled and stored at the Silva Ranch, especially during periods of wet weather. Pursuant to Title 27 CCR Section 20210, such waste can only be stored at this facility in a Class I or a Class II waste management unit equipped with an engineered liner system and a leachate collection and recovery system (LCRS).

SITE DESCRIPTION

9. The *Water Quality Control Plan for the Sacramento River and San Joaquin River Basin, Fourth Edition* (hereafter Basin Plan) designates beneficial uses, establishes water quality objectives, and contains implementation plans and policies for all waters of the Basin. Pursuant to Section 13263(a) of the California Water Code, waste discharge requirements must implement the Basin Plan.

10. Surface water drainage is to Browns Creek, which is a tributary to Laguna Creek, which is tributary to the Cosumnes River, as depicted on interagency hydrologic maps prepared by the California Department of Water Resources in August 1986.
11. The designated beneficial uses of the Cosumnes River, as stated in the Basin Plan, are municipal supply, agricultural supply; water contact recreation; noncontact water recreation; warm freshwater habitat, cold freshwater habitat; migration of aquatic organisms; spawning, reproduction, and/or early development; and wildlife habitat.
12. The designated beneficial uses of the underlying groundwater, as specified in the Basin Plan, are municipal and domestic water supply, agricultural supply, industrial service supply, and industrial process supply.
13. The facility site is relatively flat and located at a regional topographic high point. The site is bordered by gentle, descending slopes to the north, northeast, northwest, southeast, and southwest. The pre-project elevations within the project area range from 183 feet MSL at the southwestern edge of the facility to approximately 169 feet MSL at the northwestern terminus.
14. The three primary active faults zones closest to the proposed facility are the Concord-Green, the Calaveras, and the Hayward Faults located approximately 55, 60, and 70 miles from the facility, respectively. The maximum moment earthquake magnitudes associated with these faults are 6.9, 6.8, and 7.1 on the Richter scale, respectively. Title 27 CCR requires Class II waste management units to be designed to withstand ground shaking from the Maximum Credible Earthquake (MCE) from the fault that results in the maximum peak ground acceleration at the site. The RWD states that the MCE for the site would result in a peak ground acceleration of 0.45g.
15. Precipitation data for the site is from the Department of Water Resources monitoring station Clay 1 NW DWR # B00 1785 50. The average annual rainfall for the 54-year period between 1931 and 2001 is 16.9 inches. The 24-hour, 1,000-year storm event is 4.7 inches. The 100-year annual precipitation is 32 inches. The average annual evaporation for the 22-year period between 1957 and 1978 is 68 inches.
16. The waste management facility is not within a 100-year flood plain based on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map.
17. Land uses within one mile of the facility are agricultural, and include animal grazing and growing of animal crops.
18. The general site area is underlain by Pliocene-age and Tertiary-age non-marine fluvial and alluvial sediments. Crystalline basement rock underlies the site at great depth. Locally, and to the maximum depth of exploration, the facility area is primarily underlain by Pliocene-age, non-marine fluvial and alluvial sediments of the Laguna Formation in addition to minor surficial fills. Soil beneath the facility generally consists of silty, gravelly, and sandy clay,

and clayey and silty sand to the maximum depth of exploration of 145 feet below ground surface (bgs).

SUBSURFACE AND GROUNDWATER CONDITIONS

19. The Discharger performed two subsurface investigations beneath the biosolids storage area between August 2001 and March 2002 as part of a nitrogen characterization study. Borings B-1 through B-4 were advanced during August 2001. Borings B-5 through B-8, and monitoring wells MW-1 through MW-3 were advanced during March 2002. Groundwater was encountered in boring B-2 and monitoring well MW-3 at depths of 26 feet and 18 feet bgs, respectively, indicating the presence of a seasonal perched zone of limited extent. The boring for monitoring well MW-1 was drilled to a depth of 145 feet bgs, and did not encounter groundwater. The boring was terminated prior to encountering the regional aquifer, and was screened from 47 to 145 feet bgs. The boring for monitoring well MW-2 was drilled to a depth of 36 feet, did not encounter groundwater, and was screened from 12 to 35 feet bgs. The boring for monitoring well MW-3 was drilled to a depth of 26 feet bgs, encountered groundwater at 18 feet bgs, and was screened from 6 to 25 feet bgs. A groundwater sample was not collected from MW-3 because the well was dry when the water level was measured on 12 April 2002 during an attempt to develop the well about two weeks after it had been installed. The locations of the soil borings and groundwater monitoring wells are shown on Attachment B. Monitoring wells MW-1 through MW-3 will continue to be checked for the presence of groundwater and sampled if present as required by MRP No. R5-2007-0124.
20. The depth to regional groundwater beneath the site is not known at this time. The Discharger has proposed to submit a work plan to drill additional monitoring wells at the facility, consisting of one background well and two down-gradient compliance monitoring wells completed within the regional aquifer. This Order requires the Discharger to submit the proposed work plan.
21. The nitrogen characterization studies were performed at the existing, unlined unit in response to the detection of elevated levels of nitrate as nitrogen in three lysimeters at the site. A maximum concentration of 408 milligrams per liter (mg/L) of nitrate as nitrogen was detected in the soil-pore liquid. The first study found nitrate as nitrogen in the soil beneath the biosolids storage area at concentrations ranging from 4 milligrams per kilogram (mg/kg) to 119 mg/kg, with the higher concentrations generally being in the shallowest samples at 5 to 6 feet bgs. The second study found nitrate as nitrogen at concentrations ranging from 1.5 mg/kg to 5.3 mg/kg, with the higher concentrations generally being in the shallowest samples at 3.5 feet bgs. During this second study, the highest nitrate as nitrogen concentrations were found in soil outside of the unit at 10.5 mg/kg (MW-2 at 4.5 feet bgs), and 15.9 mg/kg (B-7 at 4.5 feet bgs). This is compared with concentrations of 5.3 mg/kg (B-5 at 3.5 feet bgs) and 2.5 mg/kg (B-6 at 3.5 feet bgs) inside of the unit. A groundwater sample collected from a perched groundwater zone in boring B-2 contained nitrate as nitrogen at a concentration of 214 mg/L and had an electrical conductivity of 5,400

umhos/cm. For comparison, the water quality criterion for nitrate as nitrogen is 10 mg/L and for electrical conductivity is 700 umhos/cm. No other groundwater monitoring data is available.

PROPOSED GROUNDWATER AND UNSATURATED ZONE MONITORING

22. The Discharger proposes to conduct groundwater monitoring in the regional aquifer at one background well and two compliance wells that are yet to be installed. The Discharger proposes to monitor the wells quarterly for one year, and semi-annually thereafter. As required by Title 27 CCR, groundwater elevations must be measured quarterly. The Discharger's proposed detection monitoring program for groundwater at the facility satisfies the requirements contained in Title 27 CCR. This Order requires installation of an approved groundwater monitoring system prior to discharge of waste in the lined waste management units.
23. The Discharger proposes to conduct unsaturated zone monitoring by constructing and monitoring a pan lysimeter beneath the leachate collection sump for the Class II surface impoundment. The Discharger's proposed unsaturated zone monitoring program satisfies the requirements contained in Title 27 CCR.
24. For new units, Title 27 CCR Section 20415(e)(6) requires quarterly sampling of all Background Monitoring Points for a period of one year. Since the biosolids storage area already exists, and is now being lined in accordance with Title 27 CCR, it is an existing unit that does not currently meet regulatory standards for containment. Monitoring and Reporting Program No. R5-2007-0124 requires quarterly monitoring for the first year to establish background data. Unsaturated zone monitoring is also required which will provide the earliest possible detection of a release.

DESIGN OF WASTE MANAGEMENT UNITS

25. Title 27 CCR Section 20240 states that waste management units shall be classified according to their ability to contain wastes, and that such classification shall consider the site-specific circumstances relating to the unit's ability to protect water quality.
26. The prescriptive liner requirement for a Class II waste pile given in Title 27 is two feet of compacted clay with a hydraulic conductivity of 1×10^{-6} cm/s or less.
27. The Discharger proposes an engineered alternative to the prescriptive liner requirements of Title 27 CCR for the Class II waste pile. The engineered alternative consists of the following components from the top down:
 - a. 24 inches of compacted fill operations layer.
 - b. Geotextile fabric filter layer.
 - c. 6 inches of Leachate Collection and Removal System (LCRS) gravel.

- d. Geotextile fabric cushion layer.
 - e. 60-mil-thick High Density Polyethylene (HDPE) geomembrane.
 - f. 12-inch compacted clay liner with hydraulic conductivity of 1×10^{-6} cm/s or less.
28. The Discharger proposes to construct the waste pile liner system with a 3% slope with drainage to the Class II surface impoundment. Leachate in the waste pile LCRS gravel will also gravity drain to the Class II surface impoundment.
29. The prescriptive liner requirement for a Class II surface impoundment given in Title 27 is a double liner system consisting of two layers of compacted clay that are two feet thick and have a hydraulic conductivity of 1×10^{-6} cm/s or less. An LCRS is required between the clay liners.
30. The Discharger proposes an engineered alternative to the prescriptive liner requirements of Title 27 CCR for the Class II surface impoundment. The engineered alternative consists of the following components from the top down:
- a. A primary 80-mil-thick textured HDPE geomembrane.
 - b. A geonet drainage layer, operating as a LCRS.
 - c. A secondary 60-mil-thick HDPE geomembrane.
 - d. 12-inch compacted clay liner with hydraulic conductivity of 1×10^{-6} cm/s or less.
31. The Discharger proposes to construct a leachate collection sump at the low end of the Class II surface impoundment to collect any leachate that leaks through the primary 80-mil HDPE geomembrane. The sump will be underlain by a pan lysimeter for unsaturated zone monitoring. Both the sump and the pan lysimeter will be filled with LCRS gravel and have 6-inch diameter riser pipes extending to the surface for monitoring and leachate removal.
32. Section 20080(b) of Title 27 allows the Regional Water Board to consider the approval of an engineered alternative to the prescriptive standard. The Discharger has proposed an HDPE geomembrane in place of the prescribed clay for both the waste pile and the surface impoundment. In order to approve an engineered alternative in accordance with §20080(b), the Discharger must demonstrate the following:
- a. The prescriptive design is unreasonably and unnecessarily burdensome and will cost substantially more than an alternative which will meet the criteria contained in §20080(b) [§20080(c)(1)], or would be impractical and would not promote attainment of applicable performance standards [§20080(c)(2)];
 - b. The proposed engineered alternative(s) provides protection against water quality impairment equivalent to the prescriptive standard in accordance with §20080(b)(2) of Title 27 [§20080(b)(2)(B)]; and

- c. The proposed engineered alternative is consistent with the performance goal in accordance with §20310 of Title 27 [§20080(b)(2)(A)]. §20310 requires that Class II units be designed and constructed to prevent migration of wastes from the units to adjacent geologic materials, groundwater, or surface water.

33. The Discharger has provided information to make the demonstrations described in Finding 32. In both the prescriptive and proposed engineered alternative liner configurations, liquid passing through a hole in the uppermost (primary) geomembrane enters the underlying drainage layer and flows to a leachate collection sump where the liquid is removed. Presence of liquid in the sump is an indication of a leak in the primary liner. In the prescriptive configuration, liquid entering the LCRS flows along the LCRS/clay interface toward the sump. Since the clay is absorptive to some degree, the movement of the liquid (particularly a small trickle) toward the sump is attenuated. With an HDPE geomembrane beneath the LCRS layer, the liquid is conveyed more efficiently, providing earlier detection of penetration of the primary liner.

Containment effectiveness is also improved with the proposed alternative system. Liquids collecting in the LCRS sump are pumped out, but as pumps are rarely able to remove all liquid, there is usually some liquid present in the sump even when the sump pump is operating properly. This constant hydraulic head will eventually penetrate the prescribed secondary clay liner, releasing liquid to the underlying soils, contrary to the performance goal to prevent migration of wastes from the unit. With the alternative configuration, the secondary liner is a composite liner system consisting of an HDPE geomembrane and one foot of compacted clay. The HDPE geomembrane is essentially impermeable and, with proper construction quality assurance, provides superior containment effectiveness to the prescriptive liner system, particularly in the sump area. Improved containment provides increased assurance of prevention of migration of wastes from the surface impoundment and enhances protection against water quality impairment. Furthermore, the surface impoundment will be underlain by a pan lysimeter as part of the engineered alternative. This will provide early detection of leakage from any portion of the liner system.

The proposed engineered alternative for the waste pile and the surface impoundment provides improved protection against water quality impairment and prevention of migration of wastes from the surface impoundment as compared to the prescriptive liner, thereby complying with §20080(b)(2) of Title 27.

34. Section 13360(a)(1) of the California Water Code allows the Regional Water Board to specify the design, type of construction, and/or particular manner in which compliance must be met in waste discharge requirements or orders for the discharge of waste at solid waste disposal facilities.
35. The Discharger proposes a liner system which will be designed, constructed, and operated to prevent migration of wastes from the Unit to adjacent natural geologic materials,

groundwater, or surface water during disposal operations and closure in accordance with the criteria set forth in Title 27 for a Class II waste management unit.

36. The proposed Class II waste pile will cover an area of approximately 4.9 acres, and the Class II surface impoundment will cover an area of approximately 1.03 acres and be 15 feet deep.
37. The proposed Class II surface impoundment will be designed with a capacity of approximately 13.4 acre-feet or 4.36 million gallons. The capacity needed is based on the 100-year wet season plus the 1,000-year, 24-hour storm event, minus wet season evaporation, water used for dust control within the lined area, and the amount of rainfall expected to be absorbed by the operations layer soil. The design capacity was not reduced for rainfall that may be stored in the biosolids.

OPERATION OF WASTE MANAGEMENT UNITS

38. The facility is permitted to receive biosolids 24 hours per day, seven days per week. Requirements for use periods, capacity, and maximum length of storage are given in WDRs Order No. 95-064 and WDRs Order No. 98-023, or revisions thereto.
39. The RWD submitted by the Discharger states that accumulated sediment will be periodically removed from the Class II surface impoundment to regain capacity. Pursuant to Title 27 CCR Section 20375(f), this Order requires an inspection of the bottom of the liner prior to refilling of the impoundment. This Order also requires that sediment be removed when necessary to maintain the required design capacity.
40. The RWD submitted by the Discharger states that water from the Class II surface impoundment will be used for dust control within the lined area of the facility to help maintain capacity in the surface impoundment. This Order allows such usage, subject to certain restrictions.
41. This Order requires that the Class II surface impoundment have its full design capacity available by 1 November of each year in order to accommodate rainfall for the wet season.
42. MRP No. R5-2007-0124 provides requirements for monitoring of leachate in the leachate sump of the Class II surface impoundment. This Order provides requirements for inspection and repair of the liner system if the leakage rate through the primary geomembrane exceeds 500 gallons per day, which is based on an allowable leakage rate of 500 gallons per acre per day for the one-acre impoundment.

CLOSURE, POST-CLOSURE MAINTENANCE, AND FINANCIAL ASSURANCE

43. The RWD submitted by the Discharger contains a section on preliminary closure and post-closure maintenance for the waste management units. As required by Title 27 CCR, the units will be clean closed. The RWD includes information required by Title 27 CCR Section

21769(b), and includes a lump sum estimate of the cost of carrying out all actions necessary to close each Unit, to prepare detailed design specifications, to develop the final closure and post-closure maintenance plan, and to perform post-closure maintenance. The total amount of the closure cost estimate is \$224,835, and the amount of the post-closure maintenance cost estimate is \$27,300. Given the proposal for clean closure (as required by Title 27 CCR), post closure maintenance costs should be minimal. The Regional Water Board hereby approves these cost estimates. This Order requires that the Discharger maintain financial assurance with the Regional Water Board in at least the amount of these cost estimates.

44. The RWD submitted by the Discharger contains a cost estimate for corrective action of all known or reasonably foreseeable releases as required by Title 27 CCR Section 22222. The amount of the cost estimate is \$53,300 which includes costs for leak testing and replacement of the primary geomembrane and LCRS in the Class II surface impoundment. The Regional Water Board hereby approves this cost estimate. This Order requires that the Discharger maintain financial assurance with the Regional Water Board in at least the amount of this cost estimate.

CEQA AND OTHER CONSIDERATIONS

45. A Negative Declaration for the land spreading project was adopted by the County of Sacramento Board of Supervisors in accordance with the California Environmental Quality Act (Public Resources Code, Section 21000, et seq.) and the State Guidelines. It was found that the land spreading project would not have an adverse impact on the environment.
46. On 12 October 2005, the Sacramento County Board of Supervisors approved an updated Use Permit (No. 04-UPB-0427), and found the prior Negative Declaration for the biosolids-spreading project to still be adequate and complete. The Use Permit also allows up to 32,000 cubic yards of biosolids to be stored up to 90 days in the event of wet weather or soil conditions, but requires the biosolids storage area plans to be approved by the Regional Water Board prior to use. This Order provides the required approval.
47. This order implements:
- a. The Basin Plan and
 - b. The prescriptive standards and performance goals of the California Code of Regulations, effective 18 July 1997, and subsequent revisions.
48. Section 13267 of the California Water Code states, in part, “(a) *A regional board, in establishing...waste discharge requirements... may investigate the quality of any waters of the state within its region*” and “(b) (1) *In conducting an investigation..., the regional board may require that any person who has discharged, discharges, or is suspected of discharging, or who proposes to discharge within its region, or any citizen or domiciliary, or*

political agency or entity of this state who has discharged, discharges, or is suspected of discharging, or who proposes to discharge waste outside of its region that could affect the quality of waters of the state 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 reports and the benefits to be obtained from the reports. In requiring these reports, the regional board shall provide the person with a written explanation with regard to the need for the reports, and shall identify evidence that supports requiring the person to provide the reports.”

49. The technical reports required by this Order and the attached Monitoring and Reporting Program are necessary to assure compliance with these waste discharge requirements. Synagro West, LLC (facility owner) and Gary Silva (landowner) are responsible for the discharges of waste at the facility subject to this Order and are, therefore, subject to CWC Section 13267(b).

PROCEDURAL REQUIREMENTS

50. All local agencies with jurisdiction to regulate land use, solid waste disposal, and to protect public health have approved the use of this site for the discharges of waste to land stated herein.
51. The Regional Water 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.
52. The Regional Water Board, in a public meeting, heard and considered all comments pertaining to the discharge.
53. Any person adversely affected by this action of the Regional Water Board may petition the State Water Resources Control Board to review the action. The petition must be received by the State Board within 30 days of the date of issuance of this Order. Copies of the law and regulations applicable to filing the petition will be provided on request.

IT IS HEREBY ORDERED that pursuant to Sections 13263 and 13267 of the California Water Code, Synagro West, LLC and Gary Silva, their agents, successors, and assigns, in order to meet the provisions of Division 7 of the California Water Code and the regulations adopted thereunder, shall comply with the following:

A. PROHIBITIONS

1. The discharge of ‘hazardous waste’ at this facility is prohibited. For the purposes of this Order, the terms ‘hazardous waste’ and ‘designated waste’ are as defined in Division 2 of Title 27 of the CCR.

2. The discharge of solid waste or liquid waste to surface waters, surface water drainage courses, or groundwater is prohibited, except as authorized by Waste Discharge Requirements Order Nos. 95-064 and 98-023 and any successors, amendments, and revisions thereto.
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.
4. The discharge of domestic wastewater to the surface impoundment is prohibited.
5. The discharge or storage of wastes other than municipal biosolids or storm water runoff from the biosolids area to either of the waste management units is prohibited.
6. The discharge of waste to the Class II waste pile or surface impoundment units is prohibited until the Discharger has submitted the report required by Specification C.13 of this Order and Regional Water Board staff has made a final inspection and approved the CQA Report.
7. The discharge of waste to the Class II waste pile or surface impoundment units is prohibited until the Discharger has installed a groundwater monitoring network, collected at least one round of groundwater samples, and submitted the monitoring well installation report required by this Order.
8. The discharge of waste to the Class II waste pile or surface impoundment units is prohibited until the Discharger provides financial assurances as required by Specification H.1 and H.2 of this Order.

B. DISCHARGE SPECIFICATIONS

General Specifications

1. Wastes shall only be discharged into, and shall be confined to, the waste management units (WMUs) specifically designed for their containment.
2. Prior to the discharge of waste to a WMU, all wells within 500 feet of the unit shall have sanitary seals or shall be properly abandoned. A record of the sealing and/or abandonment of such wells shall be sent to the Regional Water Board and to the State Department of Water Resources at least 30 days prior to the first discharge of waste.
3. Objectionable odors originating at this facility shall not be perceivable beyond the limits of the Silva Ranch property.
4. As a means of discerning compliance with Discharge Specification No. B.3, the dissolved oxygen content in the upper zone (one foot) of the surface impoundment shall not be less than 1.0 mg/L.

5. At least 2 feet of freeboard shall be maintained in the Class II surface impoundment at all times.
6. Prior to or by **1 November** of each year, the Class II surface impoundment shall have its full design storage capacity of 4.36 million gallons available, minus minor amounts of sediment.
7. Leachate removed from a surface impoundment's primary LCRS shall be discharged back into to the surface impoundment or to temporary storage tanks for eventual return back to the surface impoundment.
8. The depth of the fluid in the leachate sump of the Class II surface impoundment shall be kept at the minimum needed for efficient pump operation (given the pump intake height and cycle frequency), and shall not allow leachate to back up onto the secondary liner system outside of the sump area. If leachate generation in the Class II surface impoundment exceeds 500 gallons per day (gpd) at any time, the Discharger shall inspect and repair the primary geomembrane prior to the next wet season. If inspection and repair do not reduce the leakage rate below 500 gpd, the Discharger shall conduct an electronic leak location survey to locate and repair leaks in the primary liner.
9. Leachate generation by a waste containment unit LCRS shall not exceed 85% of the design capacity of (a) the LCRS, or (b) the sump pump. If leachate generation exceeds this value, then the Discharger shall immediately cease the discharge of waste, excluding leachate, to the waste managements unit and 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 reduce leachate production.
10. Water from the Class II surface impoundment shall only be used for dust control within the Class II waste pile area. Dust control shall only be conducted when conditions are dry enough to create dust within the waste pile area, and shall not be conducted if there is standing water, saturated biosolids, nuisance odors, or vectors such as flies.

Protection From Storm Events

11. Waste management units shall be designed, constructed and operated to prevent inundation or washout due to flooding events with a 100-year return period.
12. 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.
13. 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.

C. DESIGN AND CONSTRUCTION SPECIFICATIONS

1. The Class II waste pile for the biosolids storage area shall consist of the following from the top down:
 - a. 24 inches of compacted fill operations layer.
 - b. Geotextile fabric filter layer.
 - c. 6 inches of Leachate Collection and Removal System (LCRS) gravel.
 - d. Geotextile fabric cushion layer.
 - e. 60-mil-thick High Density Polyethylene (HDPE) geomembrane.
 - f. 12-inch compacted clay liner with hydraulic conductivity of 1×10^{-6} cm/s or less.
2. The Class II surface impoundment for runoff from the biosolids storage area shall consist of the following from the top down:
 - a. A primary 80-mil-thick textured HDPE geomembrane.
 - b. A geonet drainage layer, operating as a LCRS.
 - c. A secondary 60-mil-thick HDPE geomembrane.
 - d. 12-inch compacted clay liner with hydraulic conductivity of 1×10^{-6} cm/s or less.
3. The Discharger may propose changes to the liner system design prior to construction, provided that approved components are not eliminated, the engineering properties of the components are not substantially reduced, and the proposed liner system results in the protection of water quality equal to or greater than the design prescribed by Title 27 and this Order. The proposed changes may be made following approval by the Executive Officer. Substantive changes to the design require reevaluation as an engineered alternative and require approval by the Regional Water Board.
4. The unsaturated zone monitoring system shall be capable of measuring both saturated and unsaturated flows that may occur as a result of a release from the waste management unit.
5. The design capacity of the surface impoundment shall accommodate rainfall and leachate produced from a 1,000-year, 24-hour precipitation event, and the 100-year wet season precipitation.

6. The Class II surface impoundment shall have permanent markings on the liner, or a permanent freeboard gauge so that the freeboard can be observed and recorded at any time. The markings or gauge shall have increments no greater than 6-inches.
7. Materials used to construct liners shall have appropriate physical and chemical properties to ensure containment of discharged wastes over the operating life, closure, and post-closure maintenance period of the surface impoundment.
8. Materials used to construct the LCRS shall have appropriate physical and chemical properties to ensure the required transmission of leachate over the life of the surface impoundment and the post-closure maintenance period.
9. The LCRS shall be designed, constructed, and maintained to collect twice the anticipated daily volume of leachate generated by each surface impoundment and to prevent the buildup of hydraulic head on the underlying liner at any time. The depth of the fluid in the LCRS sump shall remain below the top of the sump and shall normally reside at a level no greater than the minimum needed for safe pump operation.
10. The LCRS shall be designed and operated to function without clogging through the scheduled closure of the surface impoundment. The surface impoundment shall be equipped to facilitate annual testing to demonstrate proper operation as required by §20340(d) of Title 27.
11. The surface impoundment 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 impoundment and by wave action at the water line.
12. Following construction and at least 30 days prior to the discharge of waste, the Discharger shall submit a final CQA Report. The CQA Report shall demonstrate that the waste management units were constructed in accordance with the approved construction plans and this Order, and shall document all required testing in the approved CQA Plan. The CQA report shall also provide a certification statement by the registered professional Civil Engineer or Certified Engineering Geologist that the waste management units were constructed in accordance with the plans, this Order, and the CQA Plan.

D. DETECTION MONITORING SPECIFICATIONS

1. If leachate is detected in the unsaturated zone monitoring system of the surface impoundment (indicating a leak in the containment structures), the Discharger shall:
 - a. Immediately cease discharge of waste to the waste management units (excluding leachate to the surface impoundment) until the leaks can be found and repaired.

- b. Report to the Regional Water Board within 72 hours that the containment structures have failed.
 - c. Submit written notification of the release to the Regional Water Board within seven days. The notification should include a time schedule to repair the containment structures.
2. Discharge of wastes to the waste pile will not resume until the Regional Water Board has determined that repairs to the liners are complete and there is no further threat to water quality.

E. SOLIDS DISPOSAL

1. Sediment or solids that accumulate in the Class II surface impoundment shall be removed when necessary to maintain the designed storage capacity. Sludge and solids removal shall be accomplished in a manner that ensures the continued integrity of liners and leachate collection systems in accordance with the facility's operations plan.
2. Following sediment/solids removal from the Class II surface impoundment, the liner system shall be inspected for damage within 30 days and any damage shall be repaired within 60 days.
3. Solids or sediment removed from the Class II surface impoundment that are not used for operations layer in the waste pile area shall be properly characterized prior to offsite disposal at a properly permitted landfill facility.
4. Solids or sediment from the Class II surface impoundment may also be land-applied as biosolids in accordance with WDR Order Nos. 95-064 and 98-023 (or revisions thereto). The waste shall be characterized as a separate biosolids stream per Revised MRP No. R5-2007-0807 (or revisions thereto) prior to application. Metals and nitrogen results shall be included in all appropriate loading calculations, and the respective loading rates shall comply with the land application WDRs with regard to the loading rate limitations and cumulative loading limitations.

F. CLASS II SURFACE IMPOUNDMENT AND WASTE PILE CLOSURE

1. The closure of each surface impoundment and waste pile shall be under the direct supervision of a California registered civil engineer or certified engineering geologist.
2. At closure of the surface impoundment and waste pile, all residual wastes, including liquids, sludges, precipitates, settled solids, and liner materials and adjacent natural geologic materials contaminated by wastes, shall be completely removed and discharged to a waste management unit approved by Regional Water Board staff. If after reasonable attempts, the Discharger demonstrates the removal of all remaining contamination is infeasible, the impoundment shall be closed as a landfill.

G. 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 No. R5-2007-0124, which is attached to and made part of this Order.

H. FINANCIAL ASSURANCE

1. At least **30 days** prior to placing waste in the waste management units, the Discharger shall provide assurances of financial responsibility to the Regional Water Board as required by Title 27 CCR, Division 2, Subdivision 1, Chapter 6 to ensure closure and post-closure maintenance of each waste management unit in accordance with its approved closure/post-closure plan. The assurances of financial responsibility shall be in at least the amount of the cost estimates approved in Finding No. 43 of this Order. The assurances of financial responsibility shall provide that funds for closure shall be available to the Regional Water Board upon the issuance of any order under California Water Code, Division 7, Chapter 5.
2. At least **30 days** prior to placing waste in the waste management units, the Discharger shall provide the assurances of financial responsibility to the Regional Water Board as required by Title 27 CCR, Division 2, Subdivision 1, Chapter 6 for initiating and completing corrective action for all known or reasonably foreseeable releases in at least the amount of the cost estimate approved in Finding No. 44 of this Order. The assurances of financial responsibility shall provide that funds for corrective action shall be available to the Regional Water Board upon the issuance of any order under California Water Code, Division 7, Chapter 5.
3. The Discharger shall, by **30 April each year**, submit a report to the Regional Water Board that reports the adjustments the financial assurance funds required by Financial Assurance H.2 and H.2 to account for inflation and any changes in facility design, construction, or operation.

I. PROVISIONS

1. The Discharger shall comply with the Standard Provisions and Reporting Requirements for Discharges Regulated by Title 27 CCR, dated September 2003, 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.

2. The Discharger shall comply with Monitoring and Reporting Program No. R5-2007-0124, 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 No. R5-2007-0124 is a violation of these waste discharge requirements.
3. All technical reports required herein that involve planning, investigation, evaluation, or design, or other work requiring interpretation and proper application of engineering or geologic sciences, shall be prepared by or under the direction of persons registered to practice in California pursuant to California Business and Professions Code sections 6735, 7835, and 7835.1. As required by these laws, completed technical reports must bear the signature(s) and seal(s) of the registered professional(s) in a manner such that all work can be clearly attributed to the professional responsible for the work.
4. The following reports shall be submitted pursuant to Section 13267 of the California Water Code and shall be prepared by a California-registered professional:
 - a. By **1 October 2007**, the Discharger shall submit a work plan to install a groundwater quality monitoring system meeting the requirements on Title 27 CCR, and Attachment C of this Order. The work plan shall address both the perched groundwater (include information about the existing wells and the feasibility of monitoring perched groundwater, if any) and the underlying regional aquifer.
 - b. By **15 November 2007**, the Discharger shall submit a groundwater monitoring system installation report in accordance with the approved work plan. The report shall include, at a minimum, all information required in Attachment C of this Order.
5. By **1 February 2008**, the Discharger shall submit a Water Quality Protection Standard Report in accordance with Title 27 CCR Section 20415(e)(7), proposing data analysis methods to establish the Concentration Limits and background groundwater quality, and that includes all information required by Section C of MRP No. R5-2007-0124. The specifications for the proposed data analysis methods shall include a detailed description of the criteria to be used for determining measurably significant evidence of any release from the surface impoundment and for determining compliance with the Water Quality Protection Standard. The Water Quality Protection Standard Report shall address perched groundwater, the underlying regional aquifer, and the unsaturated zone. This may be submitted as part of the Annual Monitoring Report. Refer to Section C of MRP No. R5-2007-0124.
6. By **1 February 2009**, the Discharger shall establish Concentration Limits for each constituent of concern using the methods in the approved Water Quality Protection

Standard Report and at least four quarters of background groundwater data. This may be submitted as part of the Annual Monitoring Report. Refer to Section C of MRP No. R5-2007-0124.

7. The Discharger shall maintain legible records of the volume and type of waste discharged to and from the surface impoundment and the manner of the discharge. Such records shall be maintained at the facility until the beginning of the post-closure maintenance period. These records shall be available for review by representatives of the Regional Water Board and of the State Water Resources Control Board; copies of these records shall be sent to the Regional Water Board.
8. The Discharger shall provide proof to the Regional Water Board within **60 days** after completing final closure of the waste management units that the deed to the surface impoundment and waste pile facility property, 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 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 surface impoundment and waste pile; 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.
9. In the event of any change in control or ownership of the facility or disposal areas, the Discharger must notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be immediately forwarded to this office. To assume operation as Discharger under this Order, the succeeding owner or operator 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 Regional 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 California Water Code. Transfer shall be approved or disapproved by the Executive Officer.
10. The Regional Water Board will review this Order periodically and may revise requirements when necessary.

11. This Order shall take effect upon the date of adoption.

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 14 September 2007.

PAMELA C. CREEDON, Executive Officer

WLB: 9/14/2007
Attachments

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2007-0124

FOR
SYNAGRO WEST, LLC AND GARY SILVA
SILVA RANCH WET WEATHER BIOSOLIDS STORAGE FACILITY
CLASS II WASTE PILE AND CLASS II SURFACE IMPOUNDMENT
CONSTRUCTION, OPERATION, AND CLOSURE
SACRAMENTO COUNTY

Compliance with this Monitoring and Reporting Program (MRP), and with the companion Standard Provisions and Reporting Requirements, is ordered by Waste Discharge Requirements Order No. R5-2007-0124 (WDRs). Failure to comply with this Program, or with the Standard Provisions and Reporting Requirements dated September 2003, constitutes noncompliance with the WDRs and with California Water Code Section 13267, which can result in the imposition of civil monetary liability.

A. MONITORING

The Discharger shall comply with the monitoring program provisions of Title 27 for groundwater and the unsaturated zone, in accordance with Monitoring Specifications in Standard Provisions and Reporting Requirements (2003). All monitoring shall be conducted in accordance with the sampling procedures outlined in Section 6 of the 1 May 2007 *Construction Workplan*.

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 detection monitoring program groundwater monitoring wells, unsaturated zone monitoring devices, and leachate monitoring points 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.

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

Facility Inspection and Monitoring		
Activity	Inspection/Monitoring Frequency	Notes
Inspections		
Inspect the operations soil in the holding area. Repair/restore any depressions, ruts or gouges	Weekly	Record date of inspection, conditions observed and any resulting action.
Inspect the perimeter berms. Repair or restore any depressions, ruts or gouges	Weekly	
Inspect the detention basin primary liner	Weekly	
Inspect the sediment level in the basin	Weekly and after significant storm events	
Inspect the level of water in the detention basin	Weekly	
Inspect the primary liner leak detection sump for the presence of water	Weekly	
Inspect the vadose zone sump for the presence of water	Weekly	
Inspect the primary liner in the detention basin for scratches, wear, or holes	Annually, prior to the wet season.	
Facility Inspection	Annually, by 30 September	See Section 5.a, below
Test the LCRS	Annually, prior to the wet season.	
Monitoring		
Surface Impoundment Monitoring	Weekly, Monthly, Quarterly	
Groundwater Monitoring	Quarterly in September, December, March, and June	Quarterly monitoring for a period of 1 year and semiannually thereafter. Quarterly groundwater level monitoring continues. Maintain a log onsite of the groundwater levels.
	Semiannually in September and March	
	Semiannually in September and March	
Unsaturated Zone Monitoring	Weekly, Quarterly	
LCRS Monitoring	Weekly, Quarterly	

1. Surface Impoundment

Samples shall be collected from the surface impoundment in accordance with the table below:

Surface Impoundment Monitoring			
<u>Parameters</u>	<u>Units</u>	<u>Monitoring Frequency</u>	<u>Reporting Frequency</u>
<u>Field Parameter</u>			
Freeboard	feet and tenths	Weekly	Quarterly/Semiannually ²
Remaining Capacity	Acre-feet	Monthly	Quarterly/Semiannually ²
Dissolved Oxygen	Mg/L	Monthly	Quarterly/Semiannually ²
<u>Monitoring Parameters</u>			
Total Dissolved Solids	Mg/L	Quarterly	Quarterly/Semiannually ²
BOD ²	Mg/L	Quarterly	Quarterly/Semiannually ²
Chloride	Mg/L	Quarterly	Quarterly/Semiannually ²
Sodium	Mg/L	Quarterly	Quarterly/Semiannually ²
Sulfate	Mg/L	Quarterly	Quarterly/Semiannually ²
Ammonia as Nitrogen	Mg/L	Quarterly	Quarterly/Semiannually ²
Total Kjeldahl Nitrogen	Mg/L	Quarterly	Quarterly/Semiannually ²
Nitrate (as Nitrogen)	Mg/L	Quarterly	Quarterly/Semiannually ²

¹ 5-day, 20°C biochemical oxygen demand (BOD)

² Quarterly for the first year (four quarters) and semiannually thereafter.

2. Groundwater

The Discharger shall operate and maintain a groundwater monitoring system that complies with the applicable provisions of §20415 of Title 27. The Discharger shall collect, preserve, and transport groundwater samples in accordance with the sampling procedures outlined in Section 6 of the 1 May 2007 *Construction Workplan*.

The Discharger shall determine the groundwater flow rate and direction in the uppermost aquifer and in any zones of perched water and in any additional zone of saturation monitored pursuant to this Monitoring and Reporting Program at least quarterly, and report the results semiannually, including the times of highest and lowest elevations of the water levels in the wells. Quarterly water level measurements shall be taken in all monitoring wells, including perched zone wells MW-1 through MW-3.

Hydrographs of each well shall be submitted showing the elevation of groundwater with respect to the elevations of the top and bottom of the screened interval and the elevation of the pump intake. Hydrographs of each well shall be prepared quarterly and submitted annually.

The 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 for each well.

Groundwater samples shall be collected from the point-of-compliance wells, background wells, perched zone wells, and any additional wells added as part of the

approved groundwater monitoring system. Prior to sampling, the groundwater elevations shall be measured and the wells shall be purged of at least three well volumes until temperature, pH, and electrical conductivity have stabilized. Depth to groundwater shall be measured to the nearest 0.01 feet. Samples shall be collected and analyzed for the monitoring parameters in accordance with the methods and frequency specified in the following table:

Groundwater Monitoring			
<u>Parameters</u>	<u>Units</u>	<u>Monitoring Frequency</u>	<u>Reporting Frequency</u>
<u>Field Parameter</u>			
Groundwater Elevation	feet & hundredths, MSL	Quarterly	Quarterly/Semiannually ¹
Temperature	°C	Quarterly/Semiannually ¹	Quarterly/Semiannually ¹
Specific Conductance	umhos/cm	Quarterly/Semiannually ¹	Quarterly/Semiannually ¹
pH	pH number	Quarterly/Semiannually ¹	Quarterly/Semiannually ¹
Turbidity	NTU	Quarterly/Semiannually ¹	Quarterly/Semiannually ¹
<u>Monitoring Parameters</u>			
<u>Nitrogen:</u>			
Ammonia	mg/L	Quarterly/Semiannually ¹	Quarterly/Semiannually ¹
Total Kjeldahl Nitrogen	mg/L	Quarterly/Semiannually ¹	Quarterly/Semiannually ¹
Nitrate as Nitrogen	mg/L	Quarterly/Semiannually ¹	Quarterly/Semiannually ¹
Nitrite	mg/L	Quarterly/Semiannually ¹	Quarterly/Semiannually ¹
<u>Bacteriological/Biological:</u>			
Fecal Coliform	mg/L	Quarterly/Semiannually ¹	Quarterly/Semiannually ¹
Chemical Oxygen Demand	mg/L	Quarterly/Semiannually ¹	Quarterly/Semiannually ¹
<u>Standard Minerals:</u>			
Total Dissolved Solids	mg/L	Quarterly/Semiannually ¹	Quarterly/Semiannually ¹
Calcium	mg/L	Quarterly/Semiannually ¹	Quarterly/Semiannually ¹
Magnesium	mg/L	Quarterly/Semiannually ¹	Quarterly/Semiannually ¹
Potassium	mg/L	Quarterly/Semiannually ¹	Quarterly/Semiannually ¹
Sodium	mg/L	Quarterly/Semiannually ¹	Quarterly/Semiannually ¹
Bicarbonate	mg/L	Quarterly/Semiannually ¹	Quarterly/Semiannually ¹
Carbonate	mg/L	Quarterly/Semiannually ¹	Quarterly/Semiannually ¹
Chloride	mg/L	Quarterly/Semiannually ¹	Quarterly/Semiannually ¹
Fluoride	mg/L	Quarterly/Semiannually ¹	Quarterly/Semiannually ¹
Sulfate	mg/L	Quarterly/Semiannually ¹	Quarterly/Semiannually ¹
Phosphate	mg/L	Quarterly/Semiannually ¹	Quarterly/Semiannually ¹
Total Phosphorus	mg/L	Quarterly/Semiannually ¹	Quarterly/Semiannually ¹
Boron	mg/L	Quarterly/Semiannually ¹	Quarterly/Semiannually ¹
Iron	mg/L	Quarterly/Semiannually ¹	Quarterly/Semiannually ¹
Manganese	mg/L	Quarterly/Semiannually ¹	Quarterly/Semiannually ¹

Groundwater Monitoring			
Total Hardness	mg/L	Quarterly/Semiannually ¹	Quarterly/Semiannually ¹
Total Alkalinity	mg/L	Quarterly/Semiannually ¹	Quarterly/Semiannually ¹
Total Cations	mg/L	Quarterly/Semiannually ¹	Quarterly/Semiannually ¹
Total Anions	mg/L	Quarterly/Semiannually ¹	Quarterly/Semiannually ¹
Hydroxide	mg/L	Quarterly/Semiannually ¹	Quarterly/Semiannually ¹
<u>Title 22 Metals:</u>			
Antimony	Ug/L	Quarterly/Semiannually ¹	Quarterly/Semiannually ¹
Barium	Ug/L	Quarterly/Semiannually ¹	Quarterly/Semiannually ¹
Beryllium	Ug/L	Quarterly/Semiannually ¹	Quarterly/Semiannually ¹
Cadmium	Ug/L	Quarterly/Semiannually ¹	Quarterly/Semiannually ¹
Chromium	Ug/L	Quarterly/Semiannually ¹	Quarterly/Semiannually ¹
Cobalt	Ug/L	Quarterly/Semiannually ¹	Quarterly/Semiannually ¹
Copper	Ug/L	Quarterly/Semiannually ¹	Quarterly/Semiannually ¹
Lead	Ug/L	Quarterly/Semiannually ¹	Quarterly/Semiannually ¹
Molybdenum	Ug/L	Quarterly/Semiannually ¹	Quarterly/Semiannually ¹
Nickel	Ug/L	Quarterly/Semiannually ¹	Quarterly/Semiannually ¹
Vanadium	Ug/L	Quarterly/Semiannually ¹	Quarterly/Semiannually ¹
Zinc	Ug/L	Quarterly/Semiannually ¹	Quarterly/Semiannually ¹
Arsenic	Ug/L	Quarterly/Semiannually ¹	Quarterly/Semiannually ¹
Selenium	Ug/L	Quarterly/Semiannually ¹	Quarterly/Semiannually ¹
Silver	Ug/L	Quarterly/Semiannually ¹	Quarterly/Semiannually ¹
Thallium	Ug/L	Quarterly/Semiannually ¹	Quarterly/Semiannually ¹
Mercury	Ug/L	Quarterly/Semiannually ¹	Quarterly/Semiannually ¹
<u>Organics:</u>			
Phenols	mg/L	Quarterly/Semiannually ¹	Quarterly/Semiannually ¹
Total Organic Carbon	mg/L	Quarterly/Semiannually ¹	Quarterly/Semiannually ¹
Total Organic Halogens	mg/L	Quarterly/Semiannually ¹	Quarterly/Semiannually ¹

¹ Quarterly for the first year (four quarters) and semiannually thereafter.

3. Unsaturated Zone Monitoring

The Discharger shall operate and maintain an unsaturated zone detection monitoring system that complies with the applicable provisions of §20415 of Title 27. The Discharger shall collect, preserve, and transport samples in accordance with the quality assurance/quality control standards contained in the sampling procedures outlined in Section 6 of the 1 May 2007 *Construction Workplan*.

Unsaturated zone samples shall be collected from the monitoring devices of the approved unsaturated zone monitoring system. The collected samples shall be analyzed for the listed constituents in accordance with the methods and frequency specified in the following table. All monitoring parameters shall be graphed so as to show historical trends at each monitoring point.

Unsaturated Zone Monitoring			
<u>Parameters</u>	<u>Units</u>	<u>Monitoring Frequency</u>	<u>Reporting Frequency</u>
<u>Field Parameter</u>			
Flow Rate	gallons/day	Weekly	Quarterly/Semiannually ¹
Temperature	°C	Quarterly	Quarterly/Semiannually ¹
Specific Conductance	umhos/cm	Quarterly	Quarterly/Semiannually ¹
pH	pH number	Quarterly	Quarterly/Semiannually ¹
<u>Monitoring Parameters</u>			
Total Dissolved Solids	mg/L	Quarterly	Quarterly/Semiannually ¹
Chloride	mg/L	Quarterly	Quarterly/Semiannually ¹
Sodium	mg/L	Quarterly	Quarterly/Semiannually ¹
Sulfate	mg/L	Quarterly	Quarterly/Semiannually ¹
Ammonia as Nitrogen	mg/L	Quarterly	Quarterly/Semiannually ¹
Total Kjeldahl Nitrogen	mg/L	Quarterly	Quarterly/Semiannually ¹
Nitrate (as Nitrogen)	mg/L	Quarterly	Quarterly/Semiannually ¹

¹ Quarterly for the first year (four quarters) and semiannually thereafter.

Pan lysimeters shall be checked weekly for liquid. Monitoring shall include the total volume of liquid removed from the system. If liquid is detected, the Discharger shall perform the actions in Section D.1 of WDRs Order No. R5-2007-0124. Unsaturated zone monitoring information and data shall be included with the monitoring reports and shall include an evaluation of potential impacts of the facility on the unsaturated zone and compliance with the Water Quality Protection Standard.

While providing effective and early determination of a release, the characteristics of pan lysimeters do not lend themselves to background monitoring. Therefore, in lieu of using a pan lysimeter to collect background samples, data from the pan lysimeter will be compared to groundwater, wastewater, and if necessary, surface water, to determine the origin of the water captured in the pan lysimeter.

4. LCRS Monitoring

The LCRS sump shall be inspected weekly for leachate. Upon detection of leachate in a previously dry LCRS, the Discharger shall immediately collect a grab sample of the leachate and shall continue to collect grab samples of the leachate at the following frequencies thereafter. The LCRS shall be sampled and analyzed for the following:

LCRS Monitoring			
<u>Parameters</u>	<u>Units</u>	<u>Monitoring Frequency</u>	<u>Reporting Frequency</u>
<u>Field Parameter</u>			
Presence of liquid/leachate	observation	Weekly	Quarterly/Semiannually ¹
Flow Rate	gallons/day	Weekly	Quarterly/Semiannually ¹
Temperature	°C	Quarterly	Quarterly/Semiannually ¹
Specific Conductance	umhos/cm	Quarterly	Quarterly/Semiannually ¹
pH	pH number	Quarterly	Quarterly/Semiannually ¹
<u>Monitoring Parameters</u>			
Total Dissolved Solids	mg/L	Quarterly	Quarterly/Semiannually ¹
Chloride	mg/L	Quarterly	Quarterly/Semiannually ¹
Sodium	mg/L	Quarterly	Quarterly/Semiannually ¹
Sulfate	mg/L	Quarterly	Quarterly/Semiannually ¹
Ammonia as Nitrogen	mg/L	Quarterly	Quarterly/Semiannually ¹
Total Kjeldahl Nitrogen	mg/L	Quarterly	Quarterly/Semiannually ¹
Nitrate (as Nitrogen)	mg/L	Quarterly	Quarterly/Semiannually ¹

All LCRSs shall be tested annually to demonstrate operation in conformance with waste discharge requirements. The results of these tests shall be reported in the Annual Report and shall include comparison with earlier tests made under comparable conditions.

5. 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 any damage to the drainage control system, groundwater monitoring equipment (including wells, *etc.*), and shall include the Standard Observations contained in Section XII.S of the 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 **quarterly** during the first year (four quarters) of monitoring and **semiannually** thereafter, as required in this Monitoring and Reporting Program and as required in the Standard Provisions and Reporting Requirements. Reports which do not comply with the required format will be **REJECTED** and the Discharger shall be deemed to be in noncompliance with the WDRs. 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. All peaks shall be reported, including those which cannot be quantified and/or specifically identified. 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 Regional 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. Quarterly or Semiannual Groundwater, Unsaturated Zone, and Leachate Monitoring Reports

The quarterly or semiannual monitoring reports shall include all water quality data and observations collected during the reporting period and submitted as follows. Quarterly reports shall be submitted by the first day of the second month following the quarter (i.e., the First Quarter 2008 report is due by 1 May 2008). Semiannual reports shall be submitted by the first day of the second month following the end of the previous half-year (i.e., the First Half 2009 report is due by 1 August 2009). At a minimum the sampling and data collection required in the tables of this Monitoring and Reporting Program, Standard Provisions and Reporting Requirements (2003), and Waste Discharge Requirements shall be reported.

2. Annual Monitoring Summary Report

The Discharger shall submit an Annual Monitoring Summary Report covering the previous monitoring year. The report is due by 1 February of each year. The annual report shall contain the information specified in Standard Provisions and Reporting Requirements (2003), Section VIII.B of the “*Reports to be Filed with the Board.*” The Annual Report shall also include the results of the annual LCRS testing.

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. The inspection shall include a review of the exposed portions of the facility to ensure that all components are in good working order, as well as an assessment of any damage to the surface water 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 (2003). The inspection shall also verify that the Class II surface impoundment has its full design capacity available. 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.

4. Response to a Release

If the Discharger determines that there is either 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) or physical evidence of a release, the Discharger shall immediately notify the Regional Water Board verbally as to the Monitoring Point(s) and constituent(s) or parameter(s) involved, shall provide written notification by certified mail within seven days of such determination and implement the “Response to Release” section of the Standard Provisions and Reporting Requirements (2003).

5. Water Quality Protection Standard Report

For any proposed changes in a statistical method or concentration limits for a constituent of concern or monitoring parameter, the Discharger shall submit a Water Quality Protection Standard Report 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 AND COMPLIANCE PERIOD

1. Water Quality Protection Standard Report

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 Water Quality Protection Standard, or any modification thereto, shall be submitted for review and approval, for each monitored medium.

The report shall:

- a.** Identify **all distinct bodies of surface and groundwater** that could be affected in the event of a release from a Unit or portion of a Unit. This list shall include at least the uppermost aquifer and any permanent or ephemeral zones of perched groundwater underlying the facility.
- b.** Include a map showing the monitoring points and background monitoring points for the groundwater monitoring program. The map shall include the point of compliance in accordance with §20405 of Title 27.
- c.** Evaluate the perennial direction(s) of groundwater movement within the uppermost groundwater zone(s).

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 all Units at the facility are those listed in the tables for each monitored medium.

3. Monitoring Parameters

Monitoring parameters are constituents of concern that are the waste constituents, reaction products, hazardous constituents, and physical parameters that provide a reliable indication of a release from a Unit. The monitoring parameters for all Units are those listed in the tables for each monitored medium.

4. Concentration Limits

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

- a. By calculation in accordance with a statistical method pursuant to §20415 of Title 27; or
- b. By an acceptable alternate statistical method in accordance with §20415 of Title 27.

The Discharger shall collect four quarters (one year) of background data prior to developing Concentration Limits.

5. Point of Compliance

The point of compliance for the Concentration Limits given in C.4 at each Unit is a vertical surface located at the hydraulically downgradient limit of the Unit that extends through the uppermost aquifer underlying the Unit.

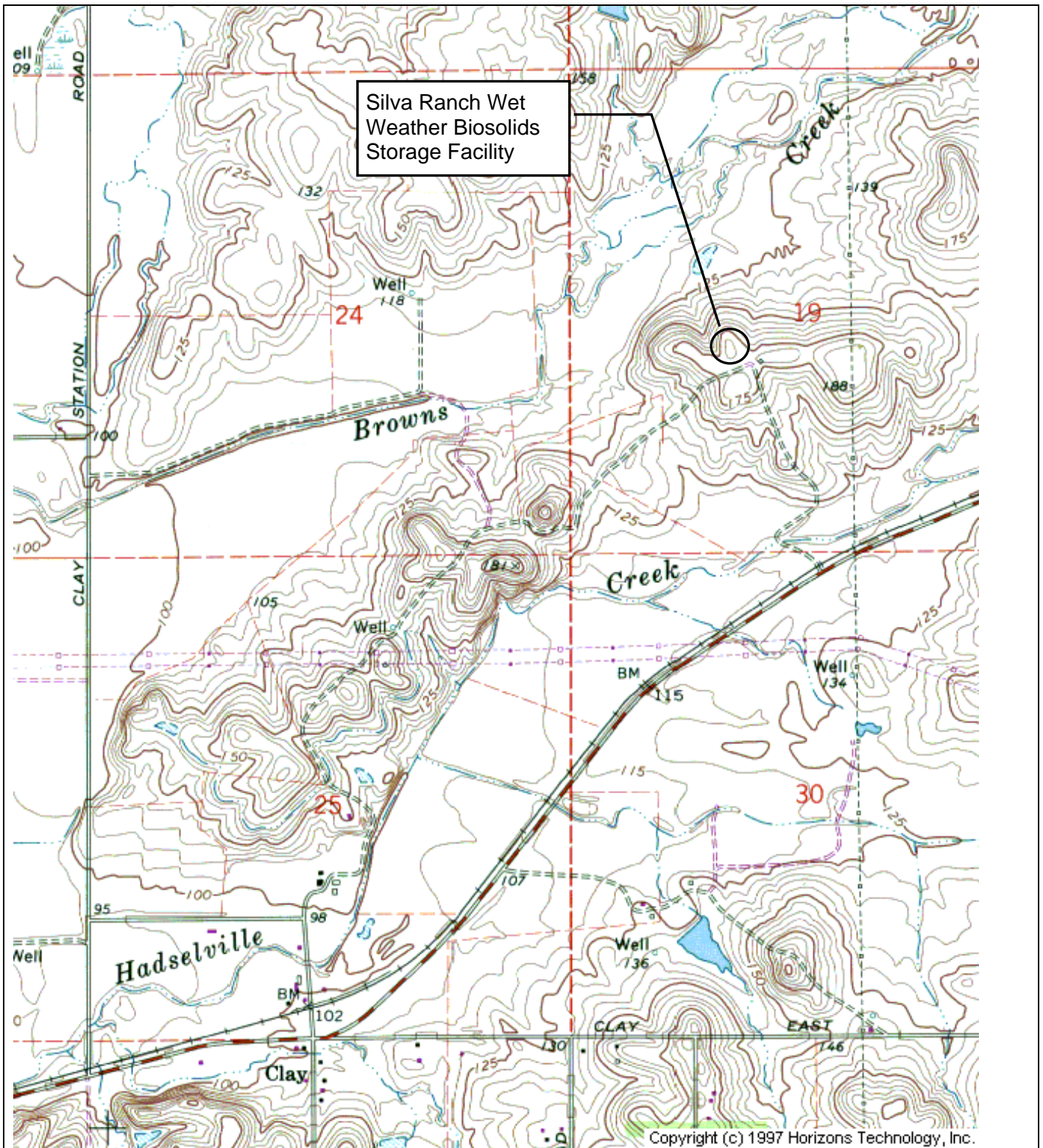
A letter transmitting the self-monitoring reports shall accompany each report. Such a letter shall include a discussion of requirement violations found during the reporting period, and actions taken or planned for correcting noted violations, such as operation or facility modifications. If the discharger has previously submitted a report describing corrective actions and/or a time schedule for implementing the corrective actions, reference to the previous correspondence will be satisfactory. The transmittal letter shall contain a statement by the discharger, or the discharger's authorized agent, under penalty of perjury, that to the best of the signer's knowledge the report is true, accurate, and complete.

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

PAMELA C. CREEDON, Executive Officer

14 September 2007

(Date)

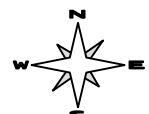


Drawing Reference:

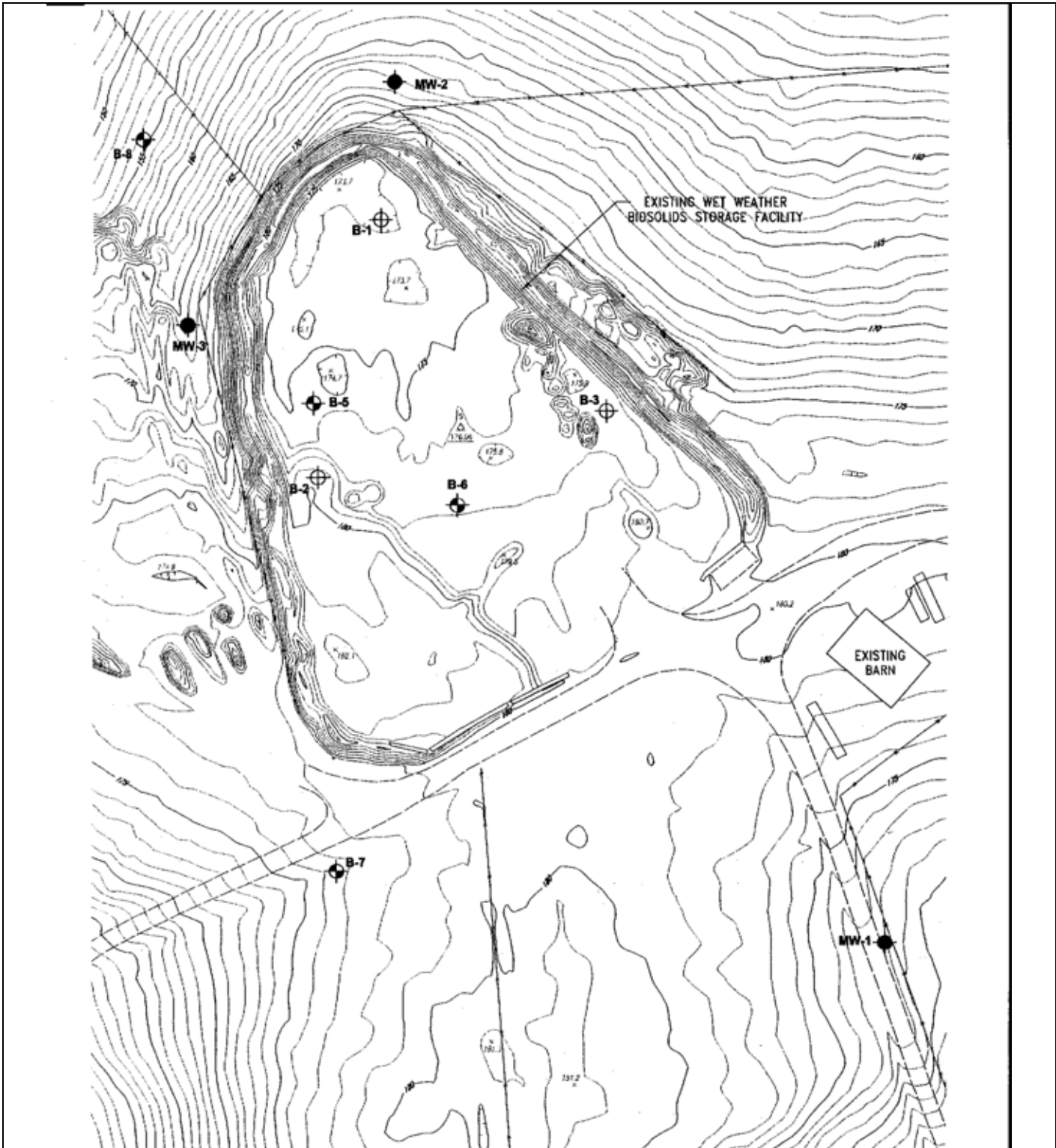
U.S.G.S TOPOGRAPHIC MAP
CLAY 7.5 MINUTE
QUADRANGLE

VICINITY MAP

SYNAGRO WEST, LLC AND GARY SILVA
SILVA RANCH WET WEATHER BIOSOLIDS
STORAGE FACILITY
SACRAMENTO COUNTY



Approx. Scale:
1 in. = 1,800 ft.

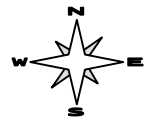


Source:

1 May 2007 *Construction Workplan*, URS Corporation, Figure No. 3

SITE MAP

SYNAGRO WEST, LLC AND GARY SILVA
SILVA RANCH WET WEATHER BIOSOLIDS
STORAGE FACILITY
SACRAMENTO COUNTY



Approx. Scale:
1" = 110'

ORDER NO. R5-2007-0124
ATTACHMENT C
REQUIREMENTS FOR
MONITORING WELL INSTALLATION WORK PLANS AND
MONITORING WELL INSTALLATION REPORTS

Prior to installation of groundwater monitoring wells, the Discharger shall submit a work plan containing, at a minimum, the information listed in Section 1, below. Wells may be installed after staff approve the work plan. Upon installation of the monitoring wells, the Discharger shall submit a well installation report which includes the information contained in Section 2, below. All work plans and reports must be prepared under the direction of, and signed by, a registered geologist or civil engineer licensed by the State of California.

SECTION 1 - Monitoring Well Installation Work Plan and
Groundwater Sampling and Analysis Plan

The monitoring well installation work plan shall contain the following minimum information:

A. General Information:

- Purpose of the well installation project
- Brief description of local geologic and hydrogeologic conditions
- Proposed monitoring well locations and rationale for well locations
- Topographic map showing facility location, roads, and surface water bodies
 - Large scaled site map showing all existing on-site wells, proposed wells, surface drainage courses, surface water bodies, buildings, waste handling facilities, utilities, and major physical and man-made features

B. Drilling Details:

- On-site supervision of drilling and well installation activities
- Description of drilling equipment and techniques
- Equipment decontamination procedures
- Soil sampling intervals (if appropriate) and logging methods

C. Monitoring Well Design (in narrative and/or graphic form):

- Diagram of proposed well construction details
 - Borehole diameter
 - Casing and screen material, diameter, and centralizer spacing (if needed)
 - Type of well caps (bottom cap either screw on or secured with stainless steel screws)
 - Anticipated depth of well, length of well casing, and length and position of perforated interval
 - Thickness, position and composition of surface seal, sanitary seal, and sand pack
 - Anticipated screen slot size and filter pack

D. Well Development (not to be performed until at least 48 hours after sanitary seal placement):

- Method of development to be used (i.e., surge, bail, pump, etc.)
- Parameters to be monitored during development and record keeping technique

Method of determining when development is complete
Disposal of development water

- E. Well Survey (precision of vertical survey data shall be at least 0.01 foot):
Identify the Licensed Land Surveyor or Civil Engineer that will perform the survey
Datum for survey measurements
List well features to be surveyed (i.e. top of casing, horizontal and vertical coordinates, etc.)
- F. Schedule for Completion of Work
- G. Appendix: Groundwater Sampling and Analysis Plan (SAP)
The Groundwater SAP shall be included as an appendix to the work plan, and shall be utilized as a guidance document that is referred to by individuals responsible for conducting groundwater monitoring and sampling activities.

Provide a detailed written description of standard operating procedures for the following:

- Equipment to be used during sampling
- Equipment decontamination procedures
- Water level measurement procedures
- Well purging (include a discussion of procedures to follow if three casing volumes cannot be purged)
- Monitoring and record keeping during water level measurement and well purging (include copies of record keeping logs to be used)
- Purge water disposal
- Analytical methods and required reporting limits
- Sample containers and preservatives
- Sampling
 - General sampling techniques
 - Record keeping during sampling (include copies of record keeping logs to be used)
 - QA/QC samples
- Chain of Custody
- Sample handling and transport

SECTION 2 - Monitoring Well Installation Report

The monitoring well installation report must provide the information listed below. In addition, the report must also clearly identify, describe, and justify any deviations from the approved work plan.

- A. General Information:
Purpose of the well installation project

Brief description of local geologic and hydrogeologic conditions encountered during installation of the wells

Number of monitoring wells installed and copies of County Well Construction Permits

Topographic map showing facility location, roads, surface water bodies

Scaled site map showing all previously existing wells, newly installed wells, surface water bodies, buildings, waste handling facilities, utilities, and other major physical and man-made features.

B. Drilling Details (in narrative and/or graphic form):

On-site supervision of drilling and well installation activities

Drilling contractor and driller's name

Description of drilling equipment and techniques

Equipment decontamination procedures

Soil sampling intervals and logging methods

Well boring log

- Well boring number and date drilled
- Borehole diameter and total depth
- Total depth of open hole (same as total depth drilled if no caving or back-grouting occurs)
- Depth to first encountered groundwater and stabilized groundwater depth
- Detailed description of soils encountered, using the Unified Soil Classification System

C. Well Construction Details (in narrative and/or graphic form):

Well construction diagram, including:

- Monitoring well number and date constructed
- Casing and screen material, diameter, and centralizer spacing (if needed)
- Length of well casing, and length and position of perforated interval
- Thickness, position and composition of surface seal, sanitary seal, and sand pack
- Type of well caps (bottom cap either screw on or secured with stainless steel screws)

E. Well Development:

Date(s) and method of development

How well development completion was determined

Volume of water purged from well and method of development water disposal

Field notes from well development should be included in report

F. Well Survey (survey the top rim of the well casing with the cap removed):

Identify the coordinate system and datum for survey measurements

Describe the measuring points (i.e. ground surface, top of casing, etc.)

Present the well survey report data in a table

Include the Registered Engineer or Licensed Surveyor's report and field notes in appendix

INFORMATION SHEET

ORDER NO. R5-2007-0124
SYNAGRO WEST, LLC AND GARY SILVA
SILVA RANCH WET WEATHER BIOSOLIDS STORAGE FACILITY
CLASS II WASTE PILE AND CLASS II SURFACE IMPOUNDMENT
CONSTRUCTION, OPERATION, AND CLOSURE
SACRAMENTO COUNTY

The Silva Ranch is a 2,800-acre property used for pasturing and growing crops for a variety of animals. Municipal biosolids are accepted at the ranch and applied to land under Waste Discharge Requirements (WDRs) Order No. 95-064 and WDRs Order No. 98-023. These Orders require the Discharger to construct waste management units meeting the requirements of Title 27, California Code of Regulations (Title 27) for storage of biosolids during wet weather when they cannot be applied to land. The Discharger has proposed a facility that will consist of a Class II waste pile and Class II surface impoundment that will receive biosolids during wet weather. The area where the facility will be constructed is shown on Attachments A and B of this Order.

The waste pile will be used for storage of biosolids when they cannot be applied to land, and the surface impoundment will capture and store runoff from the waste pile. As required by Title 27, the surface impoundment will be designed for a 1000-year, 24-hour storm event, plus expected annual precipitation, while maintaining at least two feet of freeboard. Annual precipitation required by this Order is based on a 100-year wet season.

The 24-hour, 1,000-year storm event is 4.7 inches. The 100-year annual precipitation is 32 inches. The average annual evaporation is 68 inches. Based on this information, the Discharger proposes a Class II surface impoundment with a storage capacity of approximately 13.4 acre-feet to store runoff from a combined area of approximately 5.9 acres for the waste pile and the impoundment. The proposed storage capacity is adjusted for expected evaporation, moisture retained in the operations layer soil, and use of stored wastewater for dust control within the waste pile area.

The Discharger performed two subsurface investigations beneath the biosolids storage area between August 2001 and March 2002 as part of a nitrogen characterization study. Groundwater was encountered in boring B-2 and monitoring well MW-3 at depths of 26 feet and 18 feet, respectively, indicating the presence of a seasonal perched zone of limited extent. The locations of the soil borings and groundwater monitoring wells are shown on Attachment B. The boring for monitoring well MW-1 was drilled to a depth of 145 feet bgs, and did not encounter groundwater. The boring was terminated prior to encountering the regional aquifer, and was screened from 47 to 145 feet bgs. The boring for monitoring well MW-2 was drilled to a depth of 36 feet, did not encounter groundwater, and was screened from 12 to 35 feet bgs. The boring for monitoring well MW-3 was drilled to a depth of 26 feet bgs, encountered groundwater at 18 feet bgs, and was screened from 6 to 25 feet bgs. A groundwater sample was not collected from MW-3 because the well was dry when the water level was measured on 12 April 2002 during an attempt to develop the well about two weeks after it had been installed. The locations of the soil borings and groundwater monitoring wells are shown on Attachment B. Monitoring wells MW-1 through MW-3 will continue to be

checked for the presence of groundwater and sampled if present as required by Monitoring and Reporting Program (MRP) No. R5-2007-0124. The Discharger proposes to submit a work plan to drill additional monitoring wells at the facility; one background well, and two down-gradient compliance monitoring wells to monitor the regional aquifer. This Order requires the Discharger to submit the proposed work plan.

The Discharger proposes an engineered alternative to the prescriptive liner requirements of Title 27 CCR for the Class II waste pile. The engineered alternative consists of the following components from the top down:

- a. 24 inches of compacted fill operations layer.
Geotextile fabric filter layer.
6 inches of Leachate Collection and Removal System (LCRS) gravel.
Geotextile fabric cushion layer.
60-mil-thick High Density Polyethylene (HDPE) geomembrane.

The Discharger proposes an engineered alternative to the prescriptive liner requirements of Title 27 CCR for the Class II surface impoundment. The engineered alternative consists of the following components from the top down:

- a. A primary 80-mil-thick textured HDPE geomembrane.
- b. A geonet drainage layer, operating as a LCRS.
- c. A secondary 60-mil-thick HDPE geomembrane.
- d. 12-inch compacted clay liner with hydraulic conductivity of 1×10^{-6} cm/s or less.

Information regarding the approval of these engineered alternative liner systems is included in the Findings of this Order.

Surface water drainage is to Browns Creek, which is a tributary to Laguna Creek, which is tributary to the Cosumnes River, which is tributary to the Mokelumne River, which is tributary to the Sacramento-San Joaquin River Delta, as depicted on interagency hydrologic maps prepared by the California Department of Water Resources in August 1986.

WLB: 9/14/2007