



California Regional Water Quality Control Board Central Valley Region

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30 June 2006

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NOTICE OF ADOPTION
OF
REVISED WASTE DISCHARGE REQUIREMENTS
FOR
BIOSOLIDS RECYCLING, INC.
JOSEPH AND CONNIE JESS
PAUL AND SALLY MARCIEL
JESS RANCH AND MARCIEL RANCH BIOSOLIDS APPLICATION SITES
ALAMEDA COUNTY

Waste Discharge Requirements (WDRs) Order No. R5-2006-0071 for the Jess Ranch and Marciel Ranch Biosolids Application Sites was adopted by the California Regional Water Quality Control Board, Central Valley Region at its 23 June 2006 meeting.

Please note that the Provisions of the WDRs contain a compliance schedule for submitting certain technical reports. The first scheduled due date is **30 October 2006**, when you must submit a *Preliminary Groundwater Depth Assessment Workplan*. In addition, the WDRs contain a Monitoring and Reporting Program (MRP), which specifies monitoring requirements that you must implement. Please review the MRP closely so that you may establish the appropriate sampling schedules and protocols. A copy of the Order must be maintained at the facility and must be accessible to anyone managing or performing biosolids application at the sites.

In order to conserve paper and reduce mailing costs, a paper copy of the order is being sent only to the Dischargers. Interested parties are advised that the full text of this order is available on the Regional Water Board's web site at http://www.waterboards.ca.gov/rwqcb5/adopted_orders. Anyone without access to the Internet who needs a paper copy of the order can obtain one by calling Regional Water Board staff.

California Environmental Protection Agency



If you have any questions regarding your new WDRs, please call George Lockwood at (916) 464-4697.

- Original Signed by -

MARK R. LIST, P.G., Chief
Waste Discharge to Land Unit

Enclosures - Adopted Waste Discharge Requirements
Standard Provisions and Reporting Requirements

cc w/o enc: Francis McChesney, Office of Chief Counsel, SWRCB, Sacramento
Gordon Innes, Division of Water Quality, SWRCB, Sacramento
Mark Bradley, State Water Resources Control Board, Sacramento
Department of Water Resources, Sacramento
Department of Health Services, Environmental Management Branch,
Sacramento
Department of Fish and Game, Rancho Cordova
Roel Meregillano, Alameda County Environmental Health Department, Alameda

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. R5-2006-0071

WASTE DISCHARGE REQUIREMENTS
FOR
BIOSOLIDS RECYCLING, INC.
JOSEPH AND CONNIE JESS
PAUL AND SALLY MARCIEL
JESS RANCH AND MARCIEL RANCH BIOSOLIDS APPLICATION SITES
ALAMEDA COUNTY

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

1. Biosolids Recycling, Inc., Joseph and Connie Jess, and Paul and Sally Marciel (hereafter known as "Dischargers") submitted a Report of Waste Discharge (RWD) dated 20 December 2004 for revision of Waste Discharge Requirements (WDRs) that regulate the discharge of biosolids to land. A revised RWD was received on 15 August 2005.
2. Jess Ranch, which is owned by Joseph and Connie Jess, is at 15850 Jess Ranch Road in eastern Alameda County, as shown on Attachment A, which is attached hereto and made part of the Order by reference. Marciel Ranch, owned by Paul and Sally Marciel, is adjacent to the west side of Jess Ranch. The land application areas are in Sections 24, 25, and 26, T2S, R3E, (MDB&M), and comprise Assessor's Parcel Nos. 99B-7800-7-4 and -7-8 (Jess) and 99B-7800-1-9 (Marciel).
3. Biosolids Recycling, Inc. obtains and delivers biosolids to the application sites, oversees biosolids application by the land owners, and performs monitoring and reporting related to biosolids application.

Existing Facility and Discharge

4. The Dischargers have been applying biosolids to land as a soil amendment at the Jess Ranch (450 acres) since 1992, and at the Marciel Ranch (470 acres) since 1994. Reportedly, Marciel Ranch has not received biosolids since 1996, and Jess Ranch did not receive biosolids from 2000 through 2004. Both sites are currently regulated under WDRs Order No. 94-363. The Dischargers requested that Order No. 94-363 be revised to allow for a shorter storm water detention period after biosolids are applied.
5. The biosolids application sites are divided into several 20-acre application fields for monitoring and compliance purposes. Each field receives one application of biosolids per year in accordance with the agronomic needs of the crop to be grown. Supplemental fertilizers are not used. The amount of biosolids applied is determined for each field based on the crop to be grown and the plant available nitrogen (PAN) content of the biosolids.
6. Biosolids are delivered to the ranch sites in end-dump trucks, typically at solids contents of 20 to 30 percent. The trucks deliver their loads directly to the fields (there are no centralized staging

areas). The biosolids are then loaded from the ground into a tractor-mounted box-type manure spreader using a front-end loader, with typical application rates of 20 to 35 wet tons per acre.

7. According to the RWD, biosolids are delivered, unloaded, and applied to land within 24 hours of arrival at the site, and will be incorporated into the soil within 24 hours of application using contour tilling.
8. Biosolids are typically applied from April through November; however, the Discharger would also like the option to be able to apply biosolids during the winter. Each field is seeded, typically in the late fall, with winter barley or other crops such as pasture grass mix. According to the Western Fertilizer Handbook, the nitrogen uptake for barley is 160 pounds per acre per year. The fields are not irrigated.
9. Based on the 1998 Annual Report submitted by the Dischargers, post-application soil analytical data for Jess Ranch are summarized below.

Constituent/Parameter	No. of Samples	Minimum Result	Maximum Result	WDRs Limit for Groundwater Protection
pH, std. units	35	5.38 ¹	7.60 ¹	6.5 (min.)
Cation exchange capacity, meq/100 g	35	17.8	57.2	NA
Cadmium, mg/L ²	35	<0.002	0.0046	0.1
Copper, mg/L ²	35	0.037	0.42	20.0
Lead, mg/L ²	35	<0.005	0.033	0.5
Nickel, mg/L ²	35	0.076	0.10	0.134
Zinc, mg/L ²	35	0.012	0.74	200.0

NA Not applicable

¹ Results not typical.

² Soluble concentration determined using the Waste Extraction Test with deionized water as the extractant.

Most of the samples exhibited a pH of greater than 6.5, and a cation exchange capacity greater than 30 meq/100g. Based on these data, typical biosolids applications have not caused exceedance of the soluble concentration limits prescribed in Order No. 94-363 to prevent groundwater degradation.

10. The 1998 Annual Report included the following data for calculated cumulative metals loadings at the Jess Ranch.

Constituent	Cumulative Loading (lb/acre)		WDRs Limit ¹
	Minimum	Maximum	
Arsenic	<1	2	36
Cadmium	<1	3	34
Chromium ²	1	31	1,070
Copper	18	201	1,336
Lead	2	64	267
Mercury	<1	<1	15
Molybdenum ²	<1	3	16
Nickel	2	14	374
Selenium	<1	<1	31
Zinc	22	326	2,494

¹ Limits based on requirements of 40 CFR 503. Note, however, that the State Board's General Order for land application of biosolids requires that those limits be adjusted downward to account for naturally occurring metals in the soil so that metals from biosolids application combined with naturally occurring metals will not cause soil concentrations to exceed risk-based limits determined by the U.S. EPA.

² 40 CFR 503 no longer contains concentration or loading limits for chromium, and the limits for molybdenum have been suspended by U.S. EPA pending further review. Note, however, that the State Board's General Order for land application of biosolids imposes the original limits for molybdenum.

Based on the calculated cumulative metals loading after seven years of biosolids application (1992 through 1999), it appears that the lead and copper content of biosolids will determine the number of applications remaining before the cumulative loading limits are reached, and that the cumulative loading limit for lead may be reached within 22 years if biosolids are applied each year and metals concentrations are the same as in previous years.

Compliance History

11. Order No. 94-363, originally issued to Future-Tech Environmental Services and the land owners, prohibited discharge of storm water and irrigation runoff from the fields for six months following application of biosolids. That Order also allowed biosolids to be stored on-site for up to 45 consecutive days, but required vadose zone monitoring beneath the biosolids storage facility.
12. During a routine facility inspection on 26 July 2000, staff observed that the existing runoff control and storm water detention basins were not designed to capture runoff from all of the permitted land application fields and did not appear large enough to contain all storm water for the required detention period. Additionally, there was no vadose zone monitoring system in operation at the biosolids storage area. The new facility operator (RPI/Biogro, a subsidiary of Waste Management, Inc.) stated that the storm water detention and vadose zone monitoring requirements were unnecessary and infeasible. Staff subsequently issued a Notice of Violation to the Dischargers

requiring that they either comply with the WDRs or apply for revised WDRs and justify the proposed changes.

13. In August 2000, Synagro West, Inc. purchased RPI/Biogro. Synagro's response to the NOV stated that the existing runoff controls were sufficient to protect surface water quality and that the Dischargers would cease use of the biosolids storage area in lieu of installing a vadose zone monitoring system. On 11 December 2000, staff reiterated that the existing runoff controls did not comply with the WDRs and informed the Dischargers that no further discharge would be approved until the deficiencies were corrected. Synagro agreed to cease land application, but requested that the WDRs not be rescinded.
14. In May 2004, the land owners and the former owner of Future-Tech Environmental Services (now the owner of Biosolids Recycling, Inc.) applied for an ownership change for Order No. 94-363, naming Biosolids Recycling, Inc. as the new facility operator. On 6 July 2004, staff formally informed the new operator of the previous enforcement action and requested that Biosolids Recycling, Inc. submit a detailed compliance plan before submitting any pre-application reports for staff's approval.
15. On 28 December 2004, the Dischargers submitted a RWD to apply for revised WDRs. Staff informed the Dischargers that processing the application would be delayed due to staffing constraints. Because of the anticipated shorter processing time, the Dischargers requested that staff consider the RWD as an application for coverage under State Water Resources Control Board (State Board) Order No. 2004-0012-DWQ, the General Waste Discharge Requirements for the Discharge of Biosolids to Land.
16. On 20 January 2005, staff received a proposed interim compliance plan from the Dischargers, who were seeking permission to apply biosolids before revised WDRs or coverage under the State Board's General Order were to be issued. The Dischargers proposed to apply biosolids only to portions of Jess Ranch that had adequate runoff controls and to pump the storm water detention ponds for field irrigation as needed to prevent releases of runoff from the site.
17. On 10 February 2005, staff issued a letter conditionally approving the interim compliance plan. In addition to the control proposed by the Dischargers, additional conditions included a) constructing runoff control berms between the proposed application areas and a seasonal drainage that traverses the Jess Ranch site, and b) limiting the application period to April through October 2005. The Dischargers later amended the interim compliance plan to eliminate application to areas that drain to the seasonal drainage course.
18. On 17 May 2005, staff approved the Dischargers' pre-application report (for 2005 only) on the condition that application be limited to areas that drain to detention ponds and to slopes no greater than those allowed in Order No. 94-363.

Proposed Changes in the Discharge

19. On 29 June 2005, staff informed the Dischargers that the RWD was inadequate as a Notice of Intent to apply for coverage under the State Board’s General Order for the following reasons:
 - a. The RWD did not demonstrate compliance with the slope restrictions of the General Order, which restrict applications to slopes of 25 percent or less;
 - b. The RWD did not demonstrate compliance with the setback requirements of the General Order; and
 - c. The RWD did not specify how the Dischargers would comply with the runoff control requirements of the General Order.

20. On 15 August 2005, the Dischargers submitted a revised RWD requesting individual WDRs for the land application sites. The RWD requested that Order No. 94-363 be revised to require only 30 days of storm water detention following biosolids application. The Dischargers proposed to continue to comply with:
 - a. The slope limitations of Order No. 94-363, which allow application to slopes of up to 28 degrees (i.e., 53 percent, or approximately 2H:1V); and
 - b. The setback requirements of Order No 94-363, which include a 100-foot setback from surface water drainages.

The August 2005 RWD proposed to allow biosolids applications to certain drainage areas during the rainy season (November through March), as summarized below. The drainage areas are depicted on Attachment B, which is attached hereto and made part of the Order by reference.

<u>Site/Drainage Area ID</u>	<u>Proposed Application Period</u>	
	<u>Beginning Month</u>	<u>Ending Month</u>
<u>Jess Ranch</u>		
J-1	June	August
J-1A ¹	May	November
J-2	May	September
J-3	May	September
J-4	May	October
J-5	February	December
<u>Marciel Ranch</u>		
M-1	March	December
M-2	January	December
M-3	January	December
M-4	May	October
M-5	May	September
M-6	May	September
M-7	April	September

¹ The RWD did not define the location or boundaries of this drainage area.

According to the RWD, the areas proposed for winter application (J-5, M-1, M-2, and M-3) exhibit maximum slopes ranging from 17 percent (J-5) to 31 percent or greater (M-1, M-2, and M-3). Each of these areas reportedly has a storm water detention pond with sufficient capacity to contain storm water runoff for at least 30 days during an average precipitation year based on the average year monthly maximum precipitation total of 2.40 inches. Storm water detention is discussed further below.

Because biosolids cannot be applied and incorporated after a crop has been planted, areas that receive winter applications as proposed could not be planted until sometime during the rainy season. Because saturated soil and/or steep slopes may prevent site access for tilling and planting, areas that cannot be tilled and cropped will be vulnerable to erosion. Therefore, it is appropriate to restrict winter biosolids application to slopes that are less vulnerable to erosion (i.e., slopes of 25 percent or less).

21. The December 2004 RWD included an acceptable Spill Response and Traffic Plan to provide full containment of biosolids during transport, prevent spillage, and provide for spill response where appropriate.
22. The December 2004 RWD also included an Adverse Weather and Alternative Plan that specifies the procedures to be used when biosolids cannot be land applied during brief periods due to adverse weather. In general, the Dischargers propose to divert biosolids to a permitted landfill for disposal when they cannot be land applied. During periods of sustained high wind, the Dischargers propose to stage biosolids on the fields until the wind subsides to an acceptable level (which was not defined).
23. The August 2005 RWD included drainage calculations, a summary of historical storm water monitoring data, and an Erosion Control Plan that detailed proposed methods of erosion control for the sites. This information is discussed in the context of site-specific conditions below.

Site-Specific Conditions

24. The sites exhibit rolling hilly terrain with elevations ranging from 340 to 845 feet above mean sea level (MSL). Site drainage is generally northward towards Mountain House Creek, which flows along the northern site boundary and drains to Old River.
25. According to the RWD, the sites exhibit surface slopes of nine to fifteen percent along hilltops and ridgelines, and slopes of greater than 75 percent (1.3H:1V) on the hillsides.
26. Based on a technical report submitted by the Dischargers in March 1998, surface soils at the land application sites consist primarily of up to two feet of clayey loam and clay overlying Panoche Formation sandstone interbedded with shale or Neroly Formation gravelly sandstone. However, the August 2005 RWD describes the soil mantle overlying the bedrock as up to 48 inches thick. Several weathered rock outcroppings are present at the site.

27. The August 2005 RWD states that shallow soils at the sites are neutral to slightly acid, and that the soil pH tends to increase with depth.
28. The application sites are not within the 100-year floodplain.
29. The average annual precipitation in the vicinity of the facility is approximately 13 inches. Based on the period of record for the Altamont Pass weather station, the peak precipitation month is typically January, with a monthly precipitation total of 2.40 inches.
30. The sites are in Altamont Pass, which is subject to moderate, sustained winds. Several commercial wind farms are located around the sites.
31. The reference evapotranspiration rate (ET₀) for the area is approximately 57 inches per year.
32. The Dischargers' Erosion Control Plan states that runoff from the sites and the potential for erosion from bare soil is moderate. The plan proposed to use contour tilling to control erosion, stating that it is effective on slopes of up to 35 percent, but it did not address erosion control for steeper slopes. A winter crop (typically planted in October) would provide further erosion protection, but the RWD did not demonstrate that cropping would be sufficient to prevent erosion on slopes steeper than 35 percent.
33. The operator has stated that certain slopes at the sites are too steep to allow equipment access for land application, tilling, and cropping, but did not define the maximum practical slope for such activities. Although limited site inspections have not revealed evidence of erosion problems associated with cropping practices at the sites, it is unclear whether biosolids can be applied and incorporated on slopes greater than 35 percent without causing erosion. Therefore, it is appropriate to restrict biosolids application to slopes that are shallow enough to provide equipment access for contour tilling and to require that the Dischargers define those areas where site conditions effectively prohibit contour tilling or other effective erosion control.
34. The August 2005 RWD defined several discrete drainage areas for the ranch sites, as shown on Attachment B. Each ranch site has several storm water detention basins to control discharge of storm water to Mountain House Creek. The following table summarizes the drainage calculations and storm water detention capacity at the sites as presented in the RWD.

Site/Detention Pond ID	Drainage Area (acres)	Peak Month Runoff (acre-feet) ¹	Six-Month Runoff Total (acre-feet) ²	Pond Capacity (acre-feet)
<u>Jess Ranch</u>				
J-1	13.6	0.60	2.40	0.50
J-1A	39.5	1.74	6.97	7.3
J-2	55.6	2.45	9.81	2.15
J-3	51.7	2.27	9.11	2.17
J-4	19.5	0.86	3.44	4.13

Site/Detention Pond ID	Drainage Area (acres)	Peak Month Runoff (acre-feet) ¹	Six-Month Runoff Total (acre-feet) ²	Pond Capacity (acre-feet)
J-5	86.3	3.80	15.23	28.33
<u>Marciel Ranch</u>				
M-1	51.7	2.27	9.11	18.4
M-2	32.6	1.43	5.75	>20
M-3	17.5	0.77	3.08	>20
M-4	89.1	3.92	15.71	9.2
M-5	148.5	6.53	26.19	2.3
M-6	54.5	2.40	9.62	0
M-7	25.3	1.11	4.46	0

¹ Based on average year precipitation; peak precipitation occurs in January.

² Based on average year precipitation totals for October through March.

As indicated above, the Dischargers acknowledge that six of the drainage areas (J-1, J-2, J-3, M-5, M-6, and M-7) do not have sufficient storm water detention capacity to provide thirty days of retention during a normal precipitation year. Neither Area J1-A nor its retention pond was depicted or defined on any map. Biosolids Recycling, Inc. states that the runoff calculations are conservative and that the detention ponds have never overflowed. However, the RWD did not:

- a. Provide a map showing the locations of the detention ponds at Marciel Ranch and portions of Jess Ranch; or
- b. Document the drawings, methods, and calculations used to determine the capacity of the detention ponds.

Therefore, it is appropriate to require that the Dischargers provide complete information to demonstrate storm water detention facilities sufficient to ensure compliance with this Order have been constructed prior to any further biosolids application.

35. The August 2005 RWD states that runoff control berms are needed to direct runoff from the application areas to the detention ponds and to prevent runoff from entering the three ephemeral streams that transect the sites. The RWD proposed to reconstruct the berms and detention ponds as needed prior to 15 October each year. Based on staff's December 2005 site inspection, no such berms were present.
36. The Dischargers performed storm water quality monitoring during years when biosolids were applied. Per Monitoring and Reporting Program No. 94-363, the Dischargers were required to analyze one sample of impounded storm water twice yearly. Between 1992 and 1998, a total of sixteen storm water samples were analyzed: five samples from off-site runoff (background) and eleven samples from on-site storm water detention ponds. Most of the samples were obtained between January and April. The analytical results are summarized below.

Parameter	Analytical Result					
	Background			Detention Pond		
	Minimum	Maximum	Mean	Minimum	Maximum	Mean
Electrical conductivity, umhos/cm	1,000	6,320	3,378	97	4,870	1,903
pH, standard units	7.65	8.77	8.3	7.31	9.04	8.1
BOD, mg/L	3.3	6.9	4.9	2.6	54	13
Total coliform organisms, MPN/100 mL	50	1,700	523	14	22,000	3,279
Fecal coliform organisms, MPN/100 mL	17	700	234	11	13,000	2,124
Nitrate as NO ₃ , mg/L	2.81	37	12.7	1	190	63.9
Cadmium, ug/L	<0.5	<10	NA	<0.5	<10	NA
Copper, ug/L	13	20	17	2	98	39
Lead, ug/L	6	6	6	4	60	20
Nickel, ug/L	10	20	14	10	120	31
Zinc, ug/L	5	130	48	10	590	138
Total organic carbon, mg/L	4.1	27	13.2	6.9	41	20.9

The data indicate that storm water originating off-site is typically significantly more saline than on-site runoff contained in the detention ponds. However, the on-site runoff typically contained concentrations of nitrate and metals significantly greater than the off-site samples. Because the ranch sites are used for cattle grazing, the high bacterial counts alone do not provide a good indicator of storm water contamination from biosolids application. The nitrogen and metals results indicate that storm water runoff from the sites contains waste constituents that may pose a threat to surface water quality. It is possible that dilution with storm water from upgradient sources will be sufficient to prevent degradation of surface water quality. It is appropriate to reduce the required storm water detention period to 30 days as requested, as long as the Dischargers demonstrate through surface water monitoring that surface water quality will not be degraded. It is also appropriate to require that the Dischargers expand the storm water detention ponds as needed to provide capacity for 30 days of runoff.

Groundwater Considerations

37. According to the 1998 technical report, the Panoche and Neroly formations are considered unlikely to yield sufficient quantity and quality of water for most uses. However, the report stated that there may be perched zones within the fractured rock of the Neroly Formation, and that the Panoche Formation may also yield groundwater.

38. The Dischargers have not completed a site-specific subsurface investigation to assess the occurrence and chemical quality of groundwater beneath the facility site. However, based on recent groundwater monitoring data for a gasoline service station formerly located at the Interstate 580 Grant Line Road interchange, shallow groundwater is likely to be present at an elevation of 300 feet MSL (approximately 20 to 30 feet below the ground surface) at the northeastern corner of Jess Ranch.
39. According to recent groundwater monitoring reports for the former gas station site, the groundwater gradient is generally towards the north, flowing downhill towards Interstate 580. Historical analytical data for wells upgradient of the former fuel tanks (cross gradient of Jess Ranch) are summarized below.

Parameter	Range of Results		
	MW-4	MW-7	MW-8
Electrical Conductivity, mhos/cm	1,039 to 1,500	1,136 to 6,000	375 to 4,400
pH, standard units	6.24 to 6.92	7.3 to 7.93	7.08 to 7.84
Alkalinity, mg/L	400 to 550	300 to 350	100 to 200
Nitrate as NO ₃ , mg/L	17 to 86	45 to 99	35 to 50
Sulfate, mg/L	30 to 68	85 to 100	16 to 24

These data indicate that local groundwater quality is moderately to extremely saline with nitrate concentrations that frequently exceed the applicable water quality limit of 45 mg/L. Presumably, the nitrate results from ongoing use of the adjacent land as cattle pasture. Due to the possibility of shallow groundwater at the sites and evidence of existing nitrate impacts to groundwater quality, it is appropriate to require that the Dischargers evaluate the depth to groundwater near the down slope site boundary during late spring when the water table is expected to be at its highest point. If groundwater is found at less than 25 feet below ground surface, it is appropriate to require groundwater monitoring and definition of background groundwater quality to ensure compliance with the groundwater limitations of this Order. If groundwater monitoring is necessary, the Discharger may either propose to install wells in the areas with the highest potential for groundwater impact or may propose to install wells throughout the site.

Special Considerations for Biosolids

40. Biosolids have the following characteristics which can cause water quality and public health problems if biosolids application is not properly managed:
- a. Pathogens can be present. Unless biosolids are treated or disinfected to destroy pathogens, significant concentrations of bacteria, viruses, and parasites can remain. Public health problems can be prevented with public access control and crop use restrictions. Additionally,

buffer zones around water supply wells, surface water drainage courses, and public areas are appropriate to prevent transmission of pathogens to the public.

- b. Heavy metals will be present. Over-application of heavy metals can cause groundwater degradation, plant toxicity to plants and/or soil microorganisms, or plant tissue buildup (which may lead to toxicity/adverse effects to animals). Only some of the metals commonly found in biosolids are known to cause water quality or public health problems. It is appropriate to establish application rates for those metals to prevent those problems.
 - c. Biosolids are a significant source of nitrogen. Nitrogen can be over-applied, allowing a buildup of nitrogen in soils. Excess nitrogen will eventually be converted to nitrate, which can migrate to groundwater, causing degradation and/or pollution. Therefore, it is appropriate to require that biosolids be applied at agronomic rates considering the needs of the crops to be grown and residual nitrogen from previous biosolids applications.
 - d. Biosolids are a significant source of decomposable organic matter. Excessive application can create acidic soil conditions, which may be detrimental to crops and may cause groundwater degradation. If the buffering capacity of the soil is exceeded and soil pH decreases below 5, metals (both naturally occurring and those in the biosolids) may dissolve and degrade underlying groundwater. Reducing conditions caused by oxidation of organic matter in the biosolids can also liberate iron and manganese from soil. It is therefore appropriate to require soil monitoring and pH correction as needed. The RWD included a soil pH management program that should be adequate to prevent such degradation.
 - e. Biosolids land application can create odor and insect nuisances if the biosolids have not been adequately stabilized or if wet biosolids are allowed to remain on the ground surface. Compliance with State and federal standards for stabilization of the biosolids will minimize the potential for odors and insect nuisances, and proper management at the application site will prevent odor or insect nuisances. Therefore, it is appropriate to impose requirements that ensure timely incorporation into the soil and buffer zones around residences and public areas.
 - f. Discharge of organic matter, metals, and pathogens to surface waters can affect water quality. It is therefore appropriate to impose requirements to control field runoff after biosolids application.
41. Most of the nitrogen present in biosolids is in organic form, which must be mineralized to ammonia and then nitrate, which is the form of nitrogen that plants utilize. Organic nitrogen from biosolids typically does not completely mineralize during the first year after it is applied, and some may remain present in the soil as humus indefinitely. Therefore, it is common for land applications of biosolids to exceed the total nitrogen requirements of the crop in order to ensure that sufficient plant available nitrogen (PAN) is applied each year. In order to prevent nitrogen over application, biosolids application rates should be based on consideration of the nitrogen content of the biosolids to be applied, nitrogen mineralization from previous years' biosolids applications, and all supplemental nutrient sources (including livestock waste). Appendix E of the US Environmental Protection Agency's *Guide for [Biosolids] Land Appliers* (EPA/831-B-93-002b) describes appropriate procedures for determining PAN for fresh biosolids based on the total nitrogen content and residual PAN from previous years' applications. It is therefore appropriate to

require that the Dischargers calculate PAN using the procedure, volatilization factors, and mineralization rates described that document.

Basin Plan, Beneficial Uses, and Regulatory Considerations

42. The Water Quality Control Plan for the Sacramento River and San Joaquin River Basins, Fourth Edition, (hereafter Basin Plan) designates beneficial uses, establishes water quality objectives, contains implementation plans and policies for protecting waters of the basin, and incorporates by reference plans and policies adopted by the State Board. Pursuant to Section 13263(a) of the California Water Code, waste discharge requirements must implement the Basin Plan.
43. Surface water drainage is to Mountain House Creek, which is tributary to Old River in the Sacramento San Joaquin Delta. The beneficial uses of the Sacramento San Joaquin Delta are municipal and domestic supply; agricultural supply; industrial supply, water contact recreation; non-contact water recreation; warm freshwater habitat; cold freshwater habitat; migration of aquatic organisms; spawning reproduction and/or early development; wildlife habitat; and navigation.
44. The beneficial uses of underlying groundwater are municipal and domestic water supply, agricultural supply, industrial service supply, and industrial process supply.
45. State Board Resolution No. 68-16 prohibits degradation of groundwater quality unless it has been shown that:
 - a. The degradation is consistent with the maximum benefit to the people of the State
 - b. The degradation will not unreasonably affect present and anticipated future beneficial uses;
 - c. The degradation does not cause exceedance of one or more water quality objectives; and
 - d. The Discharger employs best practicable treatment and control to minimize degradation.

The Dischargers have not provided the required demonstration pursuant to State Board Resolution No. 68-16 to be allowed to cause groundwater degradation. Therefore, none is authorized by this Order.

46. The discharge is exempt from the requirements of *Consolidated Regulations for Treatment, Storage, Processing, or Disposal of Solid Waste*, as set forth in Title 27, CCR, Division 2, Subdivision 1, Section 20005, et seq., (hereafter Title 27). The exemption pursuant to Section 20090(b), is based on the following:
 - a. The Regional Board is issuing waste discharge requirements,
 - b. The discharge complies with the Basin Plan, and
 - c. The biosolids do not need to be managed according to Title 22 CCR, Division 4.5, and Chapter 11, as a hazardous waste.

The exemption does not apply to storage of biosolids for periods exceeding seven calendar days. If the Dischargers elect to operate a long-term biosolids storage facility on-site, that facility will require a separate Order pursuant to Title 27, CCR.

47. The United States Environmental Protection Agency (USEPA) has promulgated biosolids reuse regulations in 40 CFR 503 that establish criteria for water quality protection, limits for heavy metals loading rates, and stabilization and disinfection criteria. The Regional Board is using 40 CFR 503 as a guideline for developing this Order. However, the Regional Board is not the implementing authority for 40 CFR 503, and the Dischargers and generators of biosolids that are land applied pursuant to this Order may have separate and/or additional compliance, reporting, and permitting responsibilities to the USEPA that are not addressed by this Order.
48. The State Water Resources Control Board adopted Water Quality Order No. 97-03-DWQ (National Pollutant Discharge Elimination System, General Permit No. CAS 000001, Waste Discharge Requirements for Discharges of Storm Water Associated with Industrial Activities) to regulate discharges of storm water from industrial sites to surface water. The Dischargers are not required to obtain coverage under this permit. However, it is appropriate for this Order to incorporate requirements to prevent discharge of contaminated storm water to surface water.
49. Pursuant to California Water Code Section 13263(g), discharge is a privilege, not a right, and issuance of this Order does not create a vested right to continue the discharge. Failure to provide the level of management required to assure best practicable treatment and control, preclude conditions that threaten degradation or nuisance, and protect groundwater quality will be sufficient reason to enforce this Order, modify it, or revoke it and prohibit further discharge. Therefore it is appropriate to prescribe limits for waste constituent loading and pH, but it remains the responsibility of the Dischargers to assure that its waste loading practices do not degrade groundwater or create a condition of pollution or nuisance.
50. Section 13267(b) of California Water Code provides that: "In conducting an investigation specified in subdivision (a), 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 the waters of the state within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the 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 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 monitoring and reporting program required by this Order and the attached Monitoring and Reporting Program No. R5-2006-0071 is necessary to assure compliance with these waste discharge requirements. The Dischargers operate the facility that receives the waste subject to this Order.

51. The action to update waste discharge requirements for this existing facility is exempt from the provisions of the California Environmental Quality (CEQA), in accordance with Title 14 CCR, Section 15301.
52. The Alameda County Planning Department adopted a Negative Declaration for Jess Ranch (5 February 1992) and Marciel Ranch (15 September 1993) in accordance with CEQA. The Dischargers have not proposed any changes to the discharge that would trigger subsequent review pursuant to CEQA, and the project(s), when conducted in compliance with this Order, should not cause adverse environmental impacts.

Public Notice

53. All the above and the supplemental information and details in the attached Information Sheet, which is incorporated by reference herein, were considered in establishing the following conditions of discharge.
54. The Dischargers and interested agencies and persons have been notified of the intent to prescribe waste discharge requirements for this discharge, and they have been provided an opportunity for a public hearing and an opportunity to submit their written views and recommendations.
55. All comments pertaining to the discharge were heard and considered in a public meeting.

IT IS HEREBY ORDERED that, pursuant to Sections 13263 and 13267 of the California Water Code, Order No. 94-363 is hereby rescinded, and Biosolids Recycling, Inc., Joseph and Connie Jess, and Paul and Sally Marciel and their agents, successors, and assigns, in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted thereunder, shall comply with the following:

[Note: Other prohibitions, conditions, definitions, and some methods of determining compliance are contained in the attached "Standard Provisions and Reporting Requirements for Waste Discharge Requirements" dated 1 March 1991.]

A. Discharge Prohibitions:

1. **Effective immediately**, any application of biosolids is prohibited unless and until the Executive Officer approves in writing the technical report required pursuant to Provision G.1.a.

2. Land application of biosolids to areas other than those described in Finding No. 2 and Attachments A and B (as modified by the following Prohibitions and Specifications) is prohibited.
3. Unless expressly approved in writing by the Executive Officer, land application of biosolids to areas where the slope exceeds 35 percent is prohibited.
4. Application of biosolids to areas where the slope exceeds 25 percent is prohibited between 1 November and 30 April.
5. Land application of biosolids to any area without adequate runoff control and/or 30-days of storm water detention capacity (as specified in the General Discharge Specifications) is prohibited.
6. Discharge of biosolids except as allowed for authorized biosolids storage, staging, and application is prohibited.
7. Discharge of wastes to surface waters or surface water drainage courses is prohibited.
8. Application of biosolids to saturated ground or during rainfall events is prohibited.
9. Discharge of waste classified as hazardous, as defined in Sections 2521(a) of Title 23, CCR, Division 3, Chapter 15, Section 2510, et seq., (hereafter Chapter 15), or 'designated', as defined in Section 13173 of the California Water Code, is prohibited.
10. Application of any material that results in a violation of the Safe Drinking Water and Toxic Enforcement Act (Health and Safety Code section 25249.5) is prohibited.
11. Application of Class B biosolids exhibiting a moisture content less than 50 percent is prohibited.
12. Application of biosolids at rates in excess of the nitrogen requirements of the vegetation or at rates that would degrade groundwater is prohibited.
13. Discharge of biosolids with pollutant concentrations greater than those shown below is prohibited.

<u>Constituent</u>	<u>Ceiling Concentration (mg/kg dry weight)</u>
Arsenic	75
Cadmium	85
Copper	4,300
Lead	840
Mercury	57
Molybdenum	75

<u>Constituent</u>	<u>Ceiling Concentration (mg/kg dry weight)</u>
Nickel	420
Selenium	100
Zinc	7,500

B. General Discharge Specifications:

1. Objectionable odors originating from the staging, storage, or application of biosolids shall not be perceivable beyond the respective property limits.
2. All staging, storage, and biosolids application areas shall be designed, constructed, operated, and maintained to prevent inundation or washout due to floods with a 100-year return frequency.
3. All storm water detention ponds shall be designed to provide a retention volume equivalent to the runoff total for the peak precipitation month of the average precipitation year plus two feet of freeboard (i.e., runoff generated by 2.40 inches of precipitation plus two feet of freeboard).
4. All storm water detention ponds shall be empty by 1 October each year. After that date, storm water runoff that accumulates in the ponds shall be removed as necessary until the cumulative precipitation to date has equaled or exceeded 2.40 inches. The storm water shall be land applied within the designated land application areas and shall not be allowed to run off or otherwise enter surface water drainage courses.
5. Once the cumulative precipitation to date has equaled or exceeded 2.40 inches, storm water runoff from subsequent precipitation events may be released to surface water drainage courses directly or via flow through the ponds.
6. If temporary berms will be used to direct or contain runoff during the rainy season until the cumulative precipitation has equaled or exceeded 2.40 inches, then the berms shall be reconstructed by 30 June each year.
7. No waste constituent shall be released or discharged, or placed where it will be released or discharged, in a concentration or in a mass that causes violation of the Groundwater Limitations.
8. The storage, transport, or application of biosolids shall not cause a condition of pollution or nuisance as defined by the California Water Code, Section 13050.
9. All biosolids shall comply with the applicable pathogen reduction standards listed in 40 CFR Part 503.32.
10. All biosolids shall comply with one of the applicable vector attraction reduction requirements specified in 40 CFR Part 503.33.
11. Biosolids shall not be applied to soil with a pH of less than 6.5.

12. Cumulative metals loading rates shall not exceed the risk-based cumulative loading rates (adjusted to account for background metals concentrations) as defined below:

$$BC = CR - 1.8(BS)$$

Where:

BC = Background-Adjusted Cumulative Loading Rate (lbs/ac)

CR = 40 CFR Part 503 Cumulative Pollutant Loading Rate (lb/ac)

BS = Site Background Soil Concentration (mg/Kg)

And where the values for CR for each metal are given below:

<u>Pollutant</u>	<u>Cumulative Pollutant Loading Rate (lb/ac)</u>
Arsenic	36
Cadmium	34
Copper	1,336
Lead	267
Mercury	15
Molybdenum	16
Nickel	374
Selenium	89
Zinc	2,494

13. Biosolids with a moisture content less than 75 percent shall not be applied during periods when the surface wind speed exceed 25 miles per hour.

14. Biosolids shall be incorporated into the soil within 24 hours after application. If the vector attraction reduction option defined in 40 CFR 503.33(b)(10)(i) is selected, biosolids must be incorporated into the ground within six hours of application.

C. Additional Discharge Specifications for Class B Biosolids

1. After application of biosolids, the Dischargers shall ensure the following:

- a. For at least 30 days, food, feed, and fiber crops are not harvested.
- b. For at least 60 days domestic animals shall not be grazed if average daily (daytime) air temperatures exceed 50°F.
- c. For at least 90 days domestic animals shall not be grazed if average daily (daytime) air temperatures are less than 50°F.
- d. For at least 12 months:

- i Public access to the site is restricted for sites with a high potential for public exposure;
 - ii Turf is not to be harvested if the harvested turf is placed on land with a high potential for contact by the public as defined in 40 CFR Part 503.11; and
 - iii Grazing of milking animals used for producing unpasteurized milk for human consumption is prevented if the field is used as pasture.
- e. For at least 14 months:
- i Food crops with harvested parts that touch the biosolids/soil mixture and are totally above the land surface are not harvested.

D. Biosolids Staging, Storage and Transportation Specifications

Biosolids shall be considered to be “stored” if they are placed on the ground or in non-mobile containers (i.e., not in a truck or trailer) at the application site or an intermediate storage location away from the generator/processing for more than 48 hours. Biosolids shall be considered to be “staged” if placed on the ground for brief periods solely to facilitate transfer of the biosolids between transportation and application vehicles.

1. Biosolids shall not be stored directly on the ground at any location for more than seven consecutive days.
2. Biosolids staged or stored on-site for more than 24 hours shall be covered.
3. Biosolids containing free liquids shall not be placed on the ground prior to application.
4. Areas used for short-term storage of Class B biosolids shall not be accessible to the public.
5. Biosolids storage facilities used for less than seven consecutive days between October 1 and April 30 shall be designed and maintained to prevent washout or inundation from a storm or flood with a return frequency of 100 years.
6. Biosolids storage facilities used between October 1 and April 30 shall be designed and maintained to contain all storm water generated during the 10-year, 24-hour storm event.
7. Biosolids storage facilities shall be designed, maintained, and operated to minimize erosion and leachate generation.
8. The Dischargers shall operate and maintain any biosolids storage areas in accordance with an approved biosolids storage plan.
9. All biosolids shall be transported in covered vehicles capable of containing the designated load.
10. All biosolids capable of generating free liquids shall be transported in leak proof vehicles.

11. Each biosolids transport driver shall be trained as to the nature of its load and the proper response to accidents or spill events and shall carry a copy of an approved spill response plan.

E. Land Application Area Specifications

1. Biosolids may be applied to any area within the designated land application areas where slopes exceed 10 percent only if all of the following conditions are met:
 - a. The soil depth is sufficient to support the crop;
 - b. The slope will allow safe operation of spreading and tilling equipment; and
 - c. The slope can be tilled, planted, and grazed without causing or exacerbating soil erosion.
2. Biosolids staging and application areas shall be at least:
 - a. 10 feet from property lines;
 - b. 500 feet from domestic water supply wells;
 - c. 100 feet from non-domestic water supply wells;
 - d. 50 feet from public roads and occupied onsite residences;
 - e. 100 feet from the ordinary high water line of surface waters and natural or man-made drainage courses, including wetlands and vernal pools; and
 - f. 500 feet from occupied non-agricultural buildings and off-site residences unless the property owner agrees in writing to a reduced setback distance. In no case shall the setback be less than 100 feet.
3. The Dischargers shall comply with the following restrictions;
 - a. Public access to the application fields shall be prevented for at least 12 months after biosolids application;
 - b. Grazing of animals whose products are for human consumption shall be prevented for at least one month after biosolids application;
 - c. Grazing of milking animals shall be prevented for at least 12 months after biosolids application; and
 - d. Planting of unprocessed food crops shall be prevented for at least 36 months after biosolids application.
4. Each field that receives biosolids shall be planted with a crop such that the crop can reasonably be expected to germinate and grow within eight months of biosolids application.

F. Groundwater Limitations:

1. The discharge shall not cause underlying groundwater to contain waste constituents in concentrations statistically greater than natural background water quality.

G. Provisions:

1. The following reports shall be submitted pursuant to Section 13267 of the California Water Code and shall be prepared as described in Provision G.2:
 - a. At least **30 days prior to any planned biosolids application**, the Dischargers shall submit an *Erosion and Runoff Control Compliance Report* that demonstrates that all land application areas have fully functional runoff control systems that comply with the requirements of this Order. The report shall provide the following:
 - i. Complete topographic mapping of all drainage areas, drainage courses, surface waters, storm water detention ponds, areas where slopes exceed 35 percent, and runoff control berms present at the sites. All of these features shall be clearly shown on a single map.
 - ii. Scaled drawings of each runoff detention pond and engineering calculations demonstrating the storage capacity of each pond at two feet of freeboard. Such drawings shall be prepared and signed by a licensed land surveyor.
 - iii. Runoff calculations that demonstrate sufficient runoff detention capacity to ensure compliance with the requirements of this Order.
 - iv. If approval of application to slopes greater than 35 percent is requested, a supplemental erosion control plan that specifies the maximum practical slope for contour tilling and crop planting equipment operation under both wet and dry soil conditions, as well as supplemental erosion control measures as needed.

If desired, the report can be submitted in discrete phases, with each phase consisting of one or more of the drainage areas where the necessary improvements have been completed.

- b. By **30 October 2006**, the Dischargers shall submit a *Preliminary Groundwater Depth Assessment Workplan*. The workplan shall describe the proposed installation of a single soil boring at or near the lowest point of the land application areas to assess whether shallow groundwater is, or may be seasonally, present within the land application areas at depths of 25 feet or less. The workplan shall be consistent with, and include the items listed in, the first section of Attachment C, which is attached hereto and made part of this Order by reference.
- c. By **30 June 2007**, the Dischargers shall submit a *Preliminary Groundwater Depth Assessment Report* that describes completion of the soil boring and contains the items found in the second section of Attachment C. The report shall document that the boring was completed between March and June 2007.
- d. If the report required pursuant to Provision G.1.c shows that groundwater is or may be seasonally present at a depth of less than 25 feet, by **30 July 2007**, the Dischargers shall submit a *Monitoring Well Installation Workplan*. The workplan shall describe the proposed installation of at least four groundwater monitoring wells sufficient to characterize

groundwater gradient and groundwater quality upgradient and down gradient of (a) either the entire land application area, or (b) selected areas that are believed to be most susceptible to groundwater impacts from the application of biosolids. Monitoring wells shall be constructed to yield representative samples from the uppermost layer of the uppermost aquifer and to comply with applicable well standards. The workplan shall be consistent with, and include the items listed in, the first section of Attachment D, which is attached hereto and made part of this Order by reference.

- e. If the report required pursuant to Provision G.1.c shows that groundwater is or may be seasonally present at a depth of less than 25 feet, by **30 December 2007**, the Dischargers shall submit a *Monitoring Well Installation Report* that describes the installation of groundwater monitoring wells and contains the items found in the second and third sections of Attachment D. In accordance with the Monitoring and Reporting Program, groundwater monitoring shall begin with the fourth quarter of 2007.
 - f. If the report required pursuant to Provision G.1.c shows that groundwater is or may be seasonally present at a depth of less than 25 feet, by **30 January 2010**, the Dischargers shall submit a *Background Groundwater Quality Study Report*. For each groundwater monitoring parameter/constituent identified in the MRP, the report shall present a summary of all monitoring data and calculation of the concentration in background monitoring well(s). Determination of background quality shall be made using the methods described in Title 27, Section 20415(e)(10), and shall be based on data from at least 8 consecutive quarterly (or more frequent) groundwater monitoring events. For each monitoring parameter/constituent, the report shall compare the measured concentration in each compliance monitoring well with the proposed background concentration.
2. All technical reports required herein that involve planning, investigation, evaluation, or design, or other work requiring interpretation and proper application of engineering or geological 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. To demonstrate compliance with section 415 and 3065 of Title 16, CCR, all technical reports, must contain a statement of the qualifications of the responsible registered professional(s). 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.
 3. The Dischargers shall comply with Monitoring and Reporting Program No. R5-2006-0071, which is a part of this Order, and any revisions thereto as ordered by the Executive Officer.
 4. The Dischargers shall comply with the "Standard Provisions and Reporting Requirements for Waste Discharge Requirements", dated 1 March 1991, which are attached hereto and by reference a part of this Order. This attachment and its individual paragraphs are commonly referenced as "Standard Provision(s)."

5. At least 90 days prior to termination or expiration of any lease, contract, or agreement involving the land application areas that is used to justify the capacity authorized herein and assure compliance with this Order, the Dischargers shall notify the Regional Board in writing of the situation and of what measures have been taken or are being taken to assure full compliance with this Order.
6. The Dischargers shall submit to the Regional Board on or before each compliance report due date the specified document, or if appropriate, a written report detailing compliance or noncompliance with the specific schedule date and task. If noncompliance is reported, then the Dischargers shall state the reasons for noncompliance and shall provide a schedule to come into compliance.
7. The Dischargers shall report promptly to the Regional Board any material change or proposed change in the character, location, or volume of the discharge.
8. In the event of any change in control or ownership of land or waste discharge facilities presently owned or controlled by the Dischargers, then the Dischargers shall notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be forwarded to this office.
9. The Dischargers shall comply with all conditions of this Order, including timely submittal of technical and monitoring reports as directed by the Executive Officer. Violations may result in enforcement action, including Regional Board or court orders requiring corrective action or imposing civil monetary liability, or in revision or rescission of this Order.
10. A copy of this Order shall be kept at the discharge facility for reference by operating personnel. Key operating personnel at each land application property shall be familiar with its contents.
11. The Regional Board will review this Order periodically and may revise requirements when necessary.

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 23 June 2006.

Original Signed by _____
PAMELA C. CREEDON, Executive Officer

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2006-0071

FOR

BIOSOLIDS RECYCLING, INC.

JOSEPH AND CONNIE JESS

PAUL AND SALLY MARCIEL

JESS RANCH AND MARCIEL RANCH BIOSOLIDS APPLICATION SITES

ALAMEDA COUNTY

This Monitoring and Reporting Program (MRP) describes requirements for monitoring biosolids and biosolids land application areas. This MRP is issued pursuant to Water Code Section 13267. The Dischargers shall not implement any changes to this MRP unless and until a revised MRP is issued by the Executive Officer. Specific sampling locations shall be approved by Regional Board staff prior to implementation of sampling activities.

All samples shall be representative of the volume and nature of the material sampled. The time, date, and location of each sample shall be recorded on the sample chain of custody form. Field test instruments (such as those used to measure pH and electrical conductivity) may be used provided that:

1. The operator is trained in proper use and maintenance of the instruments;
2. The instruments are calibrated prior to each monitoring event;
3. The instruments are serviced and/or calibrated by the manufacturer at the recommended frequency; and
4. Field calibration reports are submitted as described in the "Reporting" section of the MRP.

BIOSOLIDS MONITORING

Biosolids from each generator shall be sampled and analyzed as follows. Results for all chemical constituents shall be reported in mg/Kg on a dry weight basis. Composite samples may be used in lieu of grab samples if all required sample holding times are met.

For Generators Using Continuous Sludge Wasting and Disposal and for Pond Cleaning Projects:

<u>Constituent(s)</u>	<u>Sample Type</u>	<u>Sampling Schedule</u>		<u>Reporting Frequency</u>
		<u>Small Generator</u> ¹	<u>Large Generator</u> ²	
Metals (total) ³	Grab	1 per six months	1 per 200 dry tons; minimum of 1 per month	Monthly ⁶
PCB arochlors, aldrin, dieldrin ⁴	Grab	1 per six months	1 per 500 dry tons; minimum of 1 per six months	Monthly ⁶
Semi-volatile organics ⁵	Grab	1 per six months	1 per 500 dry tons; minimum of 1 per six months	Monthly ⁶
Percent moisture	Grab	1 per quarter	1 per 200 dry tons; minimum of 1 per month	Monthly ⁶

<u>Constituent(s)</u>	<u>Sample Type</u>	<u>Sampling Schedule</u>		<u>Reporting Frequency</u>
		<u>Small Generator</u> ¹	<u>Large Generator</u> ²	
Total nitrogen	Grab	1 per quarter	1 per 200 dry tons; minimum of 1 per month	Monthly ⁶
Ammonia nitrogen	Grab	1 per quarter	1 per 200 dry tons; minimum of 1 per month	Monthly ⁶
Nitrate nitrogen	Grab	1 per quarter	1 per 200 tons; minimum of 1 per month	Monthly ⁶
Total phosphorus	Grab	1 per quarter	1 per 200 tons; minimum of 1 per month	Monthly ⁶
Total potassium	Grab	1 per quarter	1 per 200 tons; minimum of 1 per month	Monthly ⁶

¹ Small generators are those that generate and/or land apply less than 350 dry tons per year (either during a cleanout project or by continuous wasting and disposal).
² Large generators are all others.
³ Include at least the following metals: arsenic, cadmium, copper, lead, mercury, molybdenum, nickel, selenium, and zinc.
⁴ Using SW 846 Method 8080.
⁵ Using EPA Method 8270.
⁶ Include analytical data in the monthly monitoring report for the month in which monitoring occurred. For months in which no monitoring takes place, the Monthly Monitoring Report shall so state.

If, for a particular biosolids generator, it can be demonstrated that the generator’s biosolids exhibit consistent chemical character over a period of at least two years, the applicable sampling schedule may be reduced by one-half upon written approval of a Biosolids Monitoring Data Summary Report. The report shall contain tabulated analytical data summaries for all biosolids monitoring data for the previous three years.

For Generators with Stockpile Disposal Projects:

<u>Constituent(s)</u>	<u>Sample Type</u>	<u>Number of Samples</u>
Metals (total)	Composite	1 per 200 dry tons; minimum of 1 per month
PCB arochlors, aldrin, dieldrin	Composite	1 per 500 dry tons; minimum of 1 per six months
Semi-volatile organics	Composite	1 per 500 dry tons; minimum of 1 per six months
Percent moisture	Composite	1 per 200 dry tons; minimum of 1 per month
Total nitrogen	Composite	1 per 200 dry tons; minimum of 1 per month
Ammonia nitrogen	Composite	1 per 200 dry tons; minimum of 1 per month
Nitrate nitrogen	Composite	1 per 200 tons; minimum of 1 per month

<u>Constituent(s)</u>	<u>Sample Type</u>	<u>Number of Samples</u>
Total phosphorus	Composite	1 per 200 tons; minimum of 1 per month
Total potassium	Composite	1 per 200 tons; minimum of 1 per month

The analytical data shall be presented in the monthly monitoring report(s) for the month(s) in which application of the biosolids occurs. For months in which no application takes place, the Monthly Monitoring Report shall so state.

ROUTINE FIELD MONITORING

The Dischargers shall establish and implement an inspection and application oversight program to monitor and control biosolids application rates and ensure compliance with the WDRs. Each discrete application field shall be managed and monitored as follows:

1. Pre-application Oversight:
 - a. Identify generator(s) whose biosolids are to be applied.
 - b. Define crop to be planted.
 - c. Calculate allowable loading rate based on soil nitrogen residual data from the previous fall and most recent plant available nitrogen (PAN) and moisture content data for the generator(s)' biosolids.
 - d. Document communication of allowable loading rates to spreader operator.
2. Pre-application Inspection:
 - a. Verify that setbacks are clearly delineated.
 - b. Verify that runoff controls are in place and functional.
 - c. Verify that culverts are blocked (where applicable).
3. Application Oversight:
 - a. Verify compliance with setbacks and allowable loading rate.
 - b. Verify compliance with soil incorporation requirements.
4. Post-application Oversight:
 - a. Confirm with irrigation manager requirements to control runoff for the specified period after application.
 - b. Calculate actual biosolids and PAN loading rates.
 - c. Note anticipated dates of planting, irrigation, and harvest.

POST-APPLICATION SOIL MONITORING

The Dischargers shall sample soil during the fourth quarter of each year as follows: two background sampling locations outside of the land application areas and six sampling locations within each discrete

drainage area identified in the Waste Discharge Requirements that has received biosolids in the last 12 calendar months (not to exceed one sample per 20 acres). Sampling locations shall be distributed to be representative of each subarea and predominant soil type. Soil samples shall be collected from each sampling location at the following depth intervals: 0 to 1 foot and 2 to 3 feet below the ground surface. Each 12-inch sample shall be thoroughly mixed to create a composite sample representative of the depth interval, and shall be analyzed as follows:

<u>Constituent/Parameter</u>	<u>Units</u>	<u>Sampling and Reporting Frequency</u> ³
Soil Classification (USCS and USDA)	--	Annually
pH	Std. units	Annually
Total Solids	% total weight	Annually
Total Alkalinity ¹	mg/Kg as CaCO ₃	Annually
Cation Exchange Capacity ¹	meq/100 grams	Annually
Electrical Conductivity	mg/Kg, mg/L	Annually
Nitrate nitrogen	mg/Kg	Annually
Total Kjeldahl nitrogen	mg/Kg	Annually
Chloride ²	mg/L	Annually
Metals ^{2,4}	mg/L	Annually

¹ To be reported on a dry weight basis; show calculations.

² Analysis shall be performed on the extract obtained from the Waste Extraction Test using distilled water as the extractant.

³ Samples shall be collected in the fall (fourth quarter). Sampling must occur at the same time each year.

⁴ Include at least the following metals: arsenic, cadmium, copper, lead, mercury, molybdenum, nickel, selenium, zinc, iron, and manganese.

SURFACE WATER MONITORING

Beginning upon adoption of this Order, the Dischargers shall sample each surface water sampling location depicted on Attachment B (R-1 through R-4, inclusive) once per month between 1 October and 30 May when water is present in the channels. Storm water monitoring shall include, at a minimum, the following:

<u>Constituent</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Sampling and Reporting Frequency</u>
pH	std.	Grab	Monthly
Total dissolved solids	mg/L	Grab	Monthly
BOD	mg/L	Grab	Monthly
Nitrate nitrogen	mg/L	Grab	Monthly

<u>Constituent</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Sampling and Reporting Frequency</u>
Ammonia nitrogen	mg/L	Grab	Monthly
Selected minerals ¹	mg/L	Grab	Monthly
Metals ²	ug/L	Grab	Monthly

¹ Selected minerals shall include, at a minimum, the following: chloride, iron, manganese, and sodium.

² Metals shall include arsenic, cadmium, copper, lead, mercury, nickel, and zinc.

GROUNDWATER MONITORING

If required pursuant to completion of the report specified in Provision G.1.c, the Dischargers shall implement the following groundwater monitoring program for all monitoring wells beginning with the fourth quarter 2007. Prior to construction of any groundwater monitoring wells, the Dischargers shall submit a Groundwater Monitoring Well Installation Workplan to the Regional Board for review and approval. Once installed, all new wells shall be added to the MRP, and all wells shall be sampled and analyzed according to the schedule below.

Prior to purging, 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 prior to sampling. Depth to groundwater shall be measured to the nearest 0.01 feet. Water table elevations shall be calculated and used to determine groundwater gradient and direction of flow. Samples shall be collected using approved EPA methods. Groundwater monitoring shall include, at a minimum, the following:

<u>Constituent</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Sampling and Reporting Frequency</u> ⁵
Depth to groundwater	0.01 feet	Measurement	Quarterly
Groundwater elevation ¹	0.01 Feet	Calculated	Quarterly
Gradient magnitude	feet/feet	Calculated	Quarterly
Gradient direction	Degrees	Calculated	Quarterly
pH	std.	Grab	Quarterly
Total dissolved solids	mg/L	Grab	Quarterly
Nitrate nitrogen	mg/L	Grab	Quarterly
Ammonia nitrogen	mg/L	Grab	Quarterly
Total coliform organisms ²	MPN/100 ml	Grab	Quarterly
Standard minerals ³	mg/L	Grab	Annually
Metals ⁴	ug/L	Grab	Annually

¹ Groundwater elevation shall be determined based on depth-to-water measurements using a surveyed measuring point elevation on the well and a surveyed reference elevation.

² Using a minimum of 15 tubes or three dilutions.

- ³ Standard Minerals shall include, at a minimum, the following elements/compounds: calcium, chloride, iron, magnesium, manganese, potassium, sodium, sulfate, total alkalinity (including alkalinity series), and hardness.
- ⁴ Metals shall include arsenic, cadmium, copper, lead, mercury, molybdenum, nickel, selenium, and zinc.
- ⁵ Beginning with the fourth quarter 2007.

REPORTING

In reporting monitoring data, the Dischargers shall arrange the data in tabular form using the format provided in the example tables, which are part of this MRP, or in another approved format so that the date, sample type (e.g., biosolids, soil, etc.), and reported analytical result for each sample are readily discernible. The data shall be summarized in such a manner to clearly illustrate compliance with waste discharge requirements and spatial or temporal trends, as applicable. The results of any monitoring done more frequently than required at the locations specified in the Monitoring and Reporting Program shall be reported in the next scheduled monitoring report.

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 Geologist and signed and stamped by the registered professional.

A. Monthly Monitoring Reports

Monthly reports shall be submitted to the Regional Board on the **1st day of the second month following the end of the monitoring period** (i.e. the January Report is due by 1 March). At a minimum, the reports shall include:

1. A scaled site map depicting each discrete field, property boundaries, roads, on-site structures, surface water bodies, drainage features, and runoff controls (as applicable);
2. The results of biosolids monitoring for each generator whose waste was applied to land during the month. Specifically, tabulated data for each generator shall be provided using the attached Biosolids Monitoring Results form (or approved revision thereof). Laboratory analytical reports need not be included, but must be provided upon request.
3. The results of routine field monitoring. Specifically, tabulated information for each discrete application field used during the month shall be provided using the attached Field Monitoring Results form (or approved revision thereof).
4. Daily precipitation, monthly total precipitation, and cumulative precipitation to date (between 1 October and 30 June only). Precipitation data shall be obtained from the Altamont Pass weather station or other approved on-site or off-site precipitation monitoring site.
5. The results of surface water monitoring if water was present at the surface water sampling locations. If water was not present, the monitoring report shall so state.
6. Whether water was present in the storm water detention ponds and, if so, the freeboard in each pond on the last day of the month.
7. If water from the storm water retention ponds was applied to land, report the areas where it was applied and the corresponding dates of application. Specify which ponds, if any, for which the 30-day retention requirement has been satisfied and the method of subsequent storm water release from the associated drainage area (e.g., pond bypass or discharge through the pond).

8. For each biosolids generator and discrete application field, a comparison of monitoring data to the discharge specifications and an explanation of any violation of those requirements.
9. If no biosolids were applied during the month, a letter report certifying that fact shall be submitted.

B. Quarterly Monitoring Reports

If required pursuant to completion of the report specified in Provision G.1.c, the Dischargers shall establish a quarterly sampling schedule for groundwater such that samples are obtained approximately every three months. Quarterly reporting shall begin with the fourth quarter 2007. Quarterly monitoring reports shall be submitted to the Board by the **1st day of the second month after the quarter** (i.e. the January-March quarterly report is due by May 1st). The Quarterly Report shall include the following:

1. Results of groundwater monitoring. The results of regular monthly monitoring reports for March, June, September and December may be incorporated into their corresponding quarterly monitoring report;
2. A narrative description of all preparatory, monitoring, sampling, and analytical testing activities for the groundwater monitoring. The narrative shall be sufficiently detailed to verify compliance with the WDR, this MRP, and the Standard Provisions and Reporting Requirements. The narrative shall be supported by field logs for each well documenting depth to groundwater; parameters measured before, during, and after purging; method of purging; calculation of casing volume; and total volume of water purged;
3. Calculation of groundwater elevations, an assessment of groundwater flow direction and gradient on the date of measurement, comparison of previous flow direction and gradient data, and discussion of seasonal trends if any;
4. A narrative discussion of the analytical results for all groundwater locations monitored including spatial and temporal trends, with reference to summary data tables, graphs, and appended analytical reports (as applicable);
5. A comparison of the monitoring data to the groundwater limitations and an explanation of any violation of those requirements;
6. Summary data tables of historical and current water table elevations and analytical results;
7. A scaled map showing relevant structures and features of the facility, the locations of monitoring wells and any other sampling stations, and groundwater elevation contours referenced to mean sea level datum; and
8. Copies of laboratory analytical report(s) for groundwater samples.

C. Annual Report

An Annual Report shall be prepared and submitted to the Regional Board by **1 February** each year. The Annual Report shall include the following:

1. The monthly monitoring report for the last month of the calendar year.

2. For each biosolids generator, a summary of all analytical data and verification of compliance with the biosolids monitoring requirements. Include all Biosolids Monitoring Results forms.
3. For each discrete application field, a chronological log of dates of biosolids application, irrigation, precipitation, and runoff control operations. Specifically, tabulated information for each discrete application field shall be provided using the attached Field Activities Summary form (or approved revision thereof).
4. For each discrete application field:
 - a. Total cumulative metals loading rates as of the end of the previous calendar year;
 - b. Calculation of the total metals and nitrogen loading rates for the year;
 - c. The cumulative metals loading rates since biosolids land application began; and
 - d. The cumulative metals loading rates to date as a percentage of the cumulative metals loading limits.
5. A report of soil monitoring, including:
 - a. Sampling and analysis activities, including a scaled map of sampling locations;
 - b. Tabulation of all soil analytical results;
 - c. Historical time vs. concentration plots for each constituent at each sampling interval;
 - d. A discussion of any observed spatial or temporal variation; and
 - e. Whether pH adjustment is needed and, if so, how and when the adjustment will be made.
6. A surface water monitoring summary report, including:
 - a. Tabular and graphical summaries of all data collected during the year;
 - b. An evaluation of the storm water quality;
 - c. A discussion of compliance and the corrective actions taken, as well as any planned or proposed actions needed to prevent discharge of pollutants in storm water runoff to surface water.
7. A report describing the runoff control berms constructed to direct runoff to the surface detention ponds and to prevent such runoff from entering the ephemeral streams during the 30-day holding period. The report shall include the date of construction of each berm, a map showing the location of all berms, and pictures verifying the construction.
8. If required pursuant to completion of the report specified in Provision G.1.c, a groundwater monitoring summary report including:
 - a. The contents of the regular groundwater monitoring report for the last sampling event of the year;
 - b. If requested by staff, tabular and graphical summaries of all data collected during the year;
 - c. An evaluation of the groundwater quality beneath the site;

- d. A discussion of compliance and the corrective actions taken, as well as any planned or proposed actions needed to bring the discharge into full compliance with the waste discharge requirements;
- e. A discussion of any data gaps and potential deficiencies/redundancies in the monitoring system or reporting program; and
- f. The results for groundwater analyses that are performed annually.

A letter transmitting the self-monitoring reports shall accompany each report. The letter shall clearly indicate the Dischargers' name, facility or site name, county, monitoring period, and type of report (i.e., monthly, quarterly, or annual). The letter shall include a discussion of any requirement violations during the reporting period and actions taken or planned for correcting noted violations, such as operation or facility modifications. If the Dischargers have 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. Pursuant to the Standard Provisions and Reporting Requirements, the transmittal letter shall contain a statement by the Dischargers or the Dischargers' authorized agent, under penalty of perjury, that to the best of the signer's knowledge, the report is true, accurate, and complete.

The Dischargers shall implement the above monitoring program as of the date of this Order.

Ordered by:

Original Signed by
PAMELA C. CREEDON, Executive Officer

June 23, 2006

(Date)

Attachments Biosolids Monitoring Results form
Monthly Field Monitoring Results form
Annual Field Activities Summary form

BIOSOLIDS MONITORING RESULTS

Generator Information

Owner Name _____
 Facility Name _____
 RWQCB Region _____
 County _____
 NPDES Permit No. _____
 WDRs Order No. _____

Project Information

Project Type _____ Pond cleanout _____ Continuous wasting/drying
 _____ Drying bed cleanout _____ Stockpile Disposal
 Estimated Project Duration _____ to _____
 Estimated Total Mass ⁴ _____ dry tons this calendar year
 Required EPA Certification Frequency _____
 Stabilization Method _____
 Pathogen Reduction Method ⁸ _____
 Vector Attraction Reduction Option ⁹ _____

Sampling Information

¹ Lab Sample ID
² Sampler's Sample ID
³ Sampler
 Sample Date
 Analysis Date

Analytical Result

	Wet Basis	Dry Basis	Wet Basis	Dry Basis	Wet Basis	Dry Basis	Wet Basis	Dry Basis	Wet Basis	Dry Basis	Wet Basis	Dry Basis
Fecal coliform, MPN/g												
Total solids, percent												
Total nitrogen, mg/Kg												
Ammonia nitrogen, mg/Kg												
Nitrate nitrogen, mg/Kg												
Total phosphorus, mg/Kg												
Total potassium, mg/Kg												

Nitrogen Loading Rate

⁵ Mineralization rate, percent												
⁶ Volatilization factor, percent												
⁷ Units conversion factor												
PAN, lbs/ton												

Footnotes

- ¹ Sample ID assigned by the analytical laboratory.
- ² Sample ID from chain of custody form.
- ³ Specify whether sampling was performed by Synagro or generator/generator's contractor.
- ⁴ Estimated mass to be land applied at this site.
- ⁶ Equals 50% for surface application; 100% for subsurface injection.
- ⁷ Equals 0.002 lbs/ton per mg/Kg.
- ⁸ Specify in detail. For example: "Class B - anaerobic digestion for ___ to ___ days at ___ to ___ degrees F (range for past month)".
- ⁹ Specify in detail. For example: "Option 1 - volatile solids reduction greater than 38%; VS in = ___, VS out = ___".

⁵ Equals 20% for aerobically digested; 30 % for aerobically digested; 25 % for aerobically/anaerobically digested; 40% for lime-stabilized.

Sampling Information

¹ Lab Sample ID

² Sampler's Sample ID

³ Sampler

Sample Date

Analysis Date

Metals Analyses

Wet Basis Dry Basis Wet Basis Dry Basis Wet Basis Dry Basis

Arsenic, mg/Kg

Cadmium, mg/Kg

Copper, mg/Kg

Lead, mg/Kg

Mercury, mg/Kg

Molybdenum, mg/Kg

Nickel, mg/Kg

Selenium, mg/Kg

Zinc, mg/Kg

	Wet Basis	Dry Basis	Wet Basis	Dry Basis	Wet Basis	Dry Basis

Semi-volatile organic compounds, detections only (mg/Kg)

PCBs/aldrin/dieldrin, detections only (mg/Kg)

Regulatory Limits				
40 CFR 503 (dry wt. basis)		22 CCR (wet wt. basis)		
mg/Kg	mg/Kg	mg/L	mg/L	mg/Kg
Table 1	Table 3	STLC	10 x STLC	TTLc
75	41	5	50	500
85	39	1	10	100
4,300	1,500	25	250	2,500
840	300	5	50	1,000
57	17	0.2	2.0	20
75		350	3,500	3,500
420	420	20	200	2,000
100	36	1	10	100
7,500	2,800	250	2,500	5,000

MONTHLY FIELD MONITORING RESULTS

Month _____ Year _____

Field Information

Field ID No.				
Gross Acreage				
Net Acreage				
Crop				
Anticipated Planting Date				
Anticipated Harvest Date				
Anticipated Irrigation Date(s)				
Next Allowable Runoff Date				

Source Information

Source ID Code	Owner Name	Facility Name

Biosolids Application Information (tonnage per field)

Day of Month	Source ID	Wet Wt.	Dry Wt.	Wet Wt.	Dry Wt.	Wet Wt.	Dry Wt.	Wet Wt.	Dry Wt.
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									
31									

Total Application (tons)				
Application Rate (tn/ac)				
PAN Application (lb)				
PAN Rate (lb/ac)				
Phosphorus Rate (lb)				
Phosphorus Rate (lb/ac)				
Potassium Rate (lb)				
Potassium Rate (lb/ac)				

MONTHLY FIELD MONITOR

Month _____

Field Information

Field ID No.	
Gross Acreage	
Net Acreage	
Crop	
Anticipated Planting Date	
Anticipated Harvest Date	
Anticipated Irrigation Date(s)	
Next Allowable Runoff Date	

Source Information

Source ID Code

Biosolids Application Information (tonnage per field)

Day of Month	Source ID	Wet Wt.	Dry Wt.
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			
31			

Total Application (tons)		
Application Rate (tn/ac)		
PAN Application (lb)		
PAN Rate (lb/ac)		
Phosphorus Rate (lb)		
Phosphorus Rate (lb/ac)		
Potassium Rate (lb)		
Potassium Rate (lb/ac)		

INFORMATION SHEET

ORDER NO. R5-2006-0071

BIOSOLIDS RECYCLING, INC., JOSEPH AND CONNIE JESS, AND PAUL AND SALLY MARCIEL
JESS RANCH AND MARCIEL RANCH BIOSOLIDS APPLICATION SITES
ALAMEDA COUNTY

Jess Ranch (450 acres) and Marciel Ranch (470 acres) have been used as biosolids land application sites intermittently since 1992, and are currently regulated under WDRs Order No. 94-363. Each field receives one application of biosolids per year in accordance with the agronomic needs of the crop to be grown. Supplemental fertilizers are not used. Following biosolids application (typically April through November), each field is cropped, and the fields are not irrigated. Cattle are grazed at the sites to remove the crop.

Based on the calculated cumulative metals loading after seven years of biosolids application at Jess Ranch (1992 through 1999), it appears that the lead and copper content of biosolids will determine the number of applications remaining before the cumulative loading limits are reached, and that the cumulative loading limit for lead may be reached within 22 years if biosolids are applied each year and metals concentrations are the same as in previous years.

Order No. 94-363, originally issued to Future-Tech Environmental Services and the land owners, prohibited discharge of storm water and irrigation runoff from the fields for six months following application of biosolids. That Order also allowed biosolids to be stored on-site for up to 45 consecutive days, but required vadose zone monitoring beneath the biosolids storage facility.

During a routine facility inspection on 26 July 2000, staff observed that the existing runoff control and storm water detention basins were not designed to capture runoff from all of the permitted land application fields and did not appear large enough to contain all storm water for the required detention period. . Additionally, there was no vadose zone monitoring system in operation at the biosolids storage area as required by the WDRs. Staff subsequently issued a Notice of Violation to the Dischargers requiring that they either comply with the WDRs or apply for revised WDRs, justifying the proposed changes. The operator agreed to cease land application, but requested that the WDRs not be rescinded.

The Dischargers requested that Order No. 94-363 be revised to require only 30 days of storm water detention following biosolids application, and to allow biosolids applications to certain drainage areas during the rainy season (November through March). The Dischargers proposed to continue to comply with:

1. The slope limitations of Order No. 94-363, which allow application to slopes of up to 28 degrees (53 percent, or greater than 2H:1V); and
2. The setback requirements of Order No 94-363, which include a 100-foot setback from surface water drainages.

The sites exhibit rolling hilly terrain with drainage to Mountain House Creek in Altamont Pass. Slopes range from nine to fifteen percent along hilltops and ridgelines, and are greater than 75 percent (1.3H:1V) on the hillsides. The sites are subject to moderate, sustained winds.

The proposed discharge does not qualify for coverage under State Water Resources Control Board (State Board) Order No. 2004-0012-DWQ, the General Waste Discharge Requirements for the Discharge of Biosolids to Land because the Dischargers wish to apply biosolids to slopes greater than 25 percent. However, many of the requirements of the General Order are appropriate for these sites. Therefore, the

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Prohibitions and Discharge Specifications of this Order are similar to those contained in the State Board's General Order. Staff's derivation of certain Discharge Specifications and Provisions contained in this Order is discussed below

Prohibition A.1 and Provision G.1.a

Based on the Report of Waste Discharge, the Dischargers have not demonstrated that the discharge as proposed complies with the Basin Plan as it pertains to protecting surface water quality that may be degraded by storm water discharges from the site. Therefore, Prohibition A.1 prohibits any application of biosolids unless and until the Executive Officer approves an *Erosion and Runoff Control Compliance Report* that demonstrates that all land application areas have fully functional runoff control systems that comply with the requirements of this Order. The specific reasons for this requirement are discussed further below.

The August 2005 RWD defined several discrete drainage areas for the ranch sites. Each ranch site has several storm water detention basins to control discharge of storm water to Mountain House Creek. The Dischargers acknowledge that six of the drainage areas do not have sufficient storm water detention capacity to provide thirty days of retention during a normal precipitation year (based on the peak month precipitation total of 2.40 inches). Biosolids Recycling, Inc. states that the runoff calculations are conservative and that the detention ponds have never overflowed. However, the RWD did not:

- a. Provide a map showing the locations of the detention ponds at Marciel Ranch and portions of Jess Ranch; or
- b. Document the drawings, methods, and calculations used to determine the capacity of the detention ponds

Therefore, it is appropriate to require that the Dischargers provide complete information to demonstrate storm water detention facilities sufficient to ensure compliance with this Order prior to any further biosolids application, as required by Prohibition A.1.

Additionally, runoff control berms are needed to direct runoff from the application areas to the detention ponds and to prevent runoff from entering the three ephemeral streams that transect the sites. The RWD proposed to reconstruct the berms and detention ponds as needed prior to 15 October each year. Based on staff's December 2005 site inspection, no such berms were present.

Provision G.1.a requires that the Dischargers submit an *Erosion and Runoff Control Compliance Report* that demonstrates that all land application areas have fully functional runoff control systems at least 30 days prior to any planned biosolids application. The report must provide the following:

- a. Complete topographic mapping of all drainage areas, drainage courses, surface waters, storm water detention ponds, areas where slopes exceed 35 percent, and runoff control berms present at the sites.
- b. Scaled drawings of each runoff detention pond and engineering calculations demonstrating the storage capacity of each pond at two feet of freeboard.
- c. Runoff calculations that demonstrate sufficient runoff detention capacity to ensure compliance with the requirements of this Order.

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- d. If approval of application to slopes greater than 35 percent is requested, a supplemental erosion control plan that includes a scaled topographic map that documents areas where slopes exceed 35 percent and specifies the maximum practical slope for contour tilling and crop planting equipment operation under both wet and dry soil conditions, as well as supplemental erosion control measures as needed.

If desired, the report can be submitted in discrete phases, with each phase consisting of one or more of the drainage areas where the necessary improvements have been completed.

Prohibition A.5 and General Discharge Specifications B.3 through B.6

The Dischargers monitored storm water quality during years when biosolids were applied. Between 1992 and 1998, a total of sixteen storm water samples were analyzed: five samples from off-site runoff (background) and eleven samples from storm water detention ponds.

The storm water monitoring data indicate that storm water originating off-site is typically significantly more saline than on-site runoff contained in the detention ponds. However, the on-site runoff typically contained concentrations of nitrate and metals significantly greater than the off-site samples, which indicates that storm water runoff from the sites contains waste constituents that may pose a threat to surface water quality.

It is possible that dilution with storm water from upgradient sources will be sufficient to prevent degradation of surface water quality. It is appropriate to reduce the required storm water detention period to 30 days as requested, as long as the Dischargers demonstrate through surface water monitoring that surface water quality will not be degraded. It is also appropriate to require that the Dischargers expand the storm water detention ponds as needed to provide capacity for 30 days of runoff as defined by General Discharge Specification B.3 (i.e., 2.40 inches of precipitation). Accordingly, Prohibition A.5 prohibits land application of biosolids to any area without adequate runoff control and/or storm water detention capacity.

In requiring that the Dischargers provide retention systems with capacity to store 30 days of runoff, it is staff's intention to ensure that the first flush of storm water from the sites will be captured and land applied, and not released to surface water. Simply retaining storm water for 30 days after biosolids application to land will not reduce the concentrations of the metals and nitrate that pose a threat to surface water quality. Based on historical monitoring data for impounded runoff, concentrations of these waste constituents were high relative to background runoff after several precipitation events. Therefore, General Discharge Specification B.3 of the proposed Order defines the design basis for all retention structures as the runoff total for the peak precipitation month of the average precipitation year plus two feet of freeboard (i.e., runoff generated by 2.40 inches of precipitation plus two feet of freeboard).

General Discharge Specification B.4 requires that all storm water detention ponds be empty by 1 October each year. After that date, storm water runoff that accumulates in the ponds must be removed as necessary until the cumulative precipitation to date has equaled or exceeded 2.40 inches. The retained storm water must be land applied within the designated land application areas and not be allowed to enter surface water drainage courses.

Discharge Specification B.5 allows the discharge of storm water runoff to surface water drainage courses

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only for runoff generated after the cumulative total precipitation since 1 October equals or exceeds 2.40 inches. The Dischargers may wish to use temporary (seasonal) berms to direct or contain storm water runoff as required. It is important that such berms be completely intact to capture the first runoff events of each rainy season. Accordingly, Discharge Specification B.6 requires that any such berms be reconstructed by 30 June each year.

Prohibitions A.3 and A.4, and Land Application Area Specification E.1

The Dischargers' Erosion Control Plan states that runoff from the sites and the potential for erosion from bare soil is moderate. The plan proposed to use contour tilling to control erosion, stating that it is effective on slopes of up to 35 percent, but it did not address erosion control for steeper slopes. A winter crop (typically planted in October) would provide further erosion protection, but the RWD did not demonstrate that cropping would be sufficient to prevent erosion on slopes steeper than 35 percent. Therefore, Prohibition A.3 prohibits land application of biosolids to areas where the slope exceeds 35 percent unless expressly approved in writing by the Executive Officer. Because of the increased erosion risk associated with late tilling and seeding of winter application areas, Prohibition A.4 allows winter application of biosolids only to areas where slopes are less vulnerable to erosion (slopes of 25 percent or less).

The operator has stated that certain slopes at the sites are too steep to allow equipment access for land application, tilling, and cropping, but did not define the maximum practical slope for such activities. Although evidence of erosion problems associated with cropping practices has not been observed at the sites, it is unclear whether biosolids can be applied and incorporated on slopes greater than 35 percent without causing erosion. Therefore, Application Area Specification E.1 allows biosolids application to slopes greater than 10 percent only if the soil depth is sufficient to support the crop; the slope will allow safe operation of spreading and tilling equipment; and the slope can be tilled, planted, and grazed without causing or exacerbating soil erosion. Provision G.1.a requires that the Dischargers define those areas where site conditions effectively prohibit contour tilling or other effective erosion control. The Executive Officer can approve application to slopes greater than 35 percent if the report demonstrates that erosion can be adequately controlled.

Land Application Area Specification E.4

Because biosolids cannot be applied and incorporated after a crop has been planted, areas that receive winter applications as proposed could not be planted until sometime during the rainy season. However, site access for tilling and planting may be prevented by saturated soil. Areas that cannot be tilled and cropped will be vulnerable to erosion. Accordingly, Land Application Area Specification E.4 requires that each field receiving biosolids be planted with a crop such that the crop can reasonably be expected to germinate and grow within eight months of biosolids application.

Provisions G.1.b through G.1.f and Groundwater Monitoring Requirements of the Monitoring and Reporting Program

The Dischargers have not completed a site-specific subsurface investigation to assess the occurrence and chemical quality of groundwater beneath the facility site. However, based on recent groundwater monitoring data for a gasoline service station formerly located at the northeastern corner of Jess Ranch, shallow groundwater may be present approximately 20 to 30 feet below the ground surface at lower portions of the ranch sites.

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Historical groundwater monitoring data for wells upgradient of the former fuel tanks indicate that local groundwater quality is moderately to extremely saline with nitrate concentrations that frequently exceed the applicable water quality limit of 45 mg/L. Presumably, the nitrate results from ongoing use of the adjacent land as cattle pasture. Due to the possibility of shallow groundwater present at the sites and evidence of existing nitrate impacts to groundwater quality, it is appropriate to require that the Dischargers evaluate the depth to groundwater near the down slope site boundary during late spring when the water table is expected to be at its highest point. If groundwater is found at less than 25 feet below ground surface, it is appropriate to require groundwater monitoring and definition of background groundwater quality to ensure compliance with the groundwater limitations of this Order.

Accordingly, Provisions G1.b through G.1.c require that the Discharger perform a limited investigation to determine if groundwater is present, or may be seasonally present, at a depth of less than 25 feet below the ground surface. If groundwater is present at that depth, Provisions G.1.d through G.1.f require that the Dischargers install monitoring wells and evaluate background groundwater quality. The Dischargers may elect to install wells in areas with the highest potential for impacts (i.e., areas where the water table is shallowest) or throughout the sites. The Monitoring and Reporting Program requires quarterly groundwater monitoring only if groundwater is present, or may be seasonally present, at a depth of less than 25 feet below the ground surface.

Surface Water Monitoring Requirements of the Monitoring and Reporting Program

Historical monitoring data for impounded storm water runoff indicate that storm water runoff from the sites contains nitrate and metals at concentrations that may pose a threat to surface water quality. It is possible that dilution with storm water from upgradient sources will be sufficient to prevent degradation of surface water quality. It is appropriate to reduce the required storm water detention period to 30 days as requested, as long as the Dischargers demonstrate through surface water monitoring that surface water quality will not be degraded. The Monitoring and Reporting Program identifies four surface water monitoring locations (one location upgradient and downgradient for each of the ranch sites) and requires monthly surface water monitoring when water is present in the surface water channels during the rainy season. If the surface water monitoring reports show increases of biosolids waste constituents in the receiving water, it may be appropriate to reopen this Order and require more stringent runoff control and retention times, or to require that the Dischargers obtain an NPDES permit for storm water discharges from the sites.

Monitoring Reports

Historically, individual WDRs for biosolids land application sites required that dischargers obtain approval prior to each application of biosolids by submitting a Pre-Application Report. A Post-Application Report was also required following application. The State Board's General Order contains a similar requirement. WDRs for other types of waste typically allow a discharger to discharge and require that the discharger comply with requirements and specifications to protect water quality. The discharger submits post-discharge monitoring reports to allow staff to verify compliance with the WDRs.

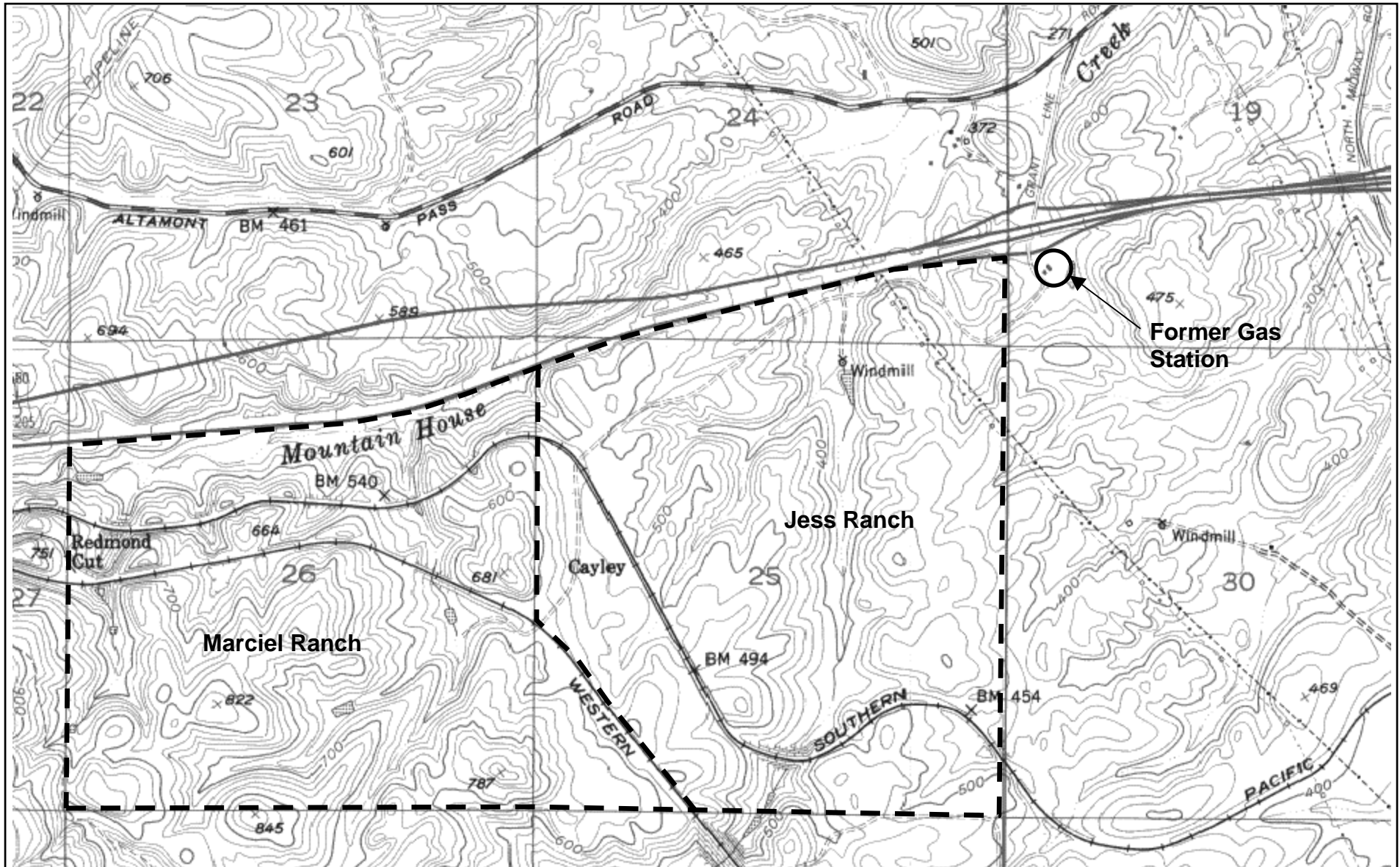
The pre-application report process for biosolids requires that staff complete the report reviews quickly so that land application could proceed, and staff has had to review multiple pre-application reports for each permitted site each year. Staff's review of numerous such reports indicates that biosolids typically have complied with the waste constituent restrictions of the WDRs. Therefore, there is not a compelling reason

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to require that the Dischargers obtain approval before each and every application. Accordingly, the Monitoring and Reporting Program requires that the Discharger submit monthly monitoring reports whose content is equivalent to the contents of both a pre- and post-application report.

ALO: 07/06/06

ATTACHMENT A



Drawing Reference:
USGS Topographic Map
7.5-Minute Quadrangle
Altamont

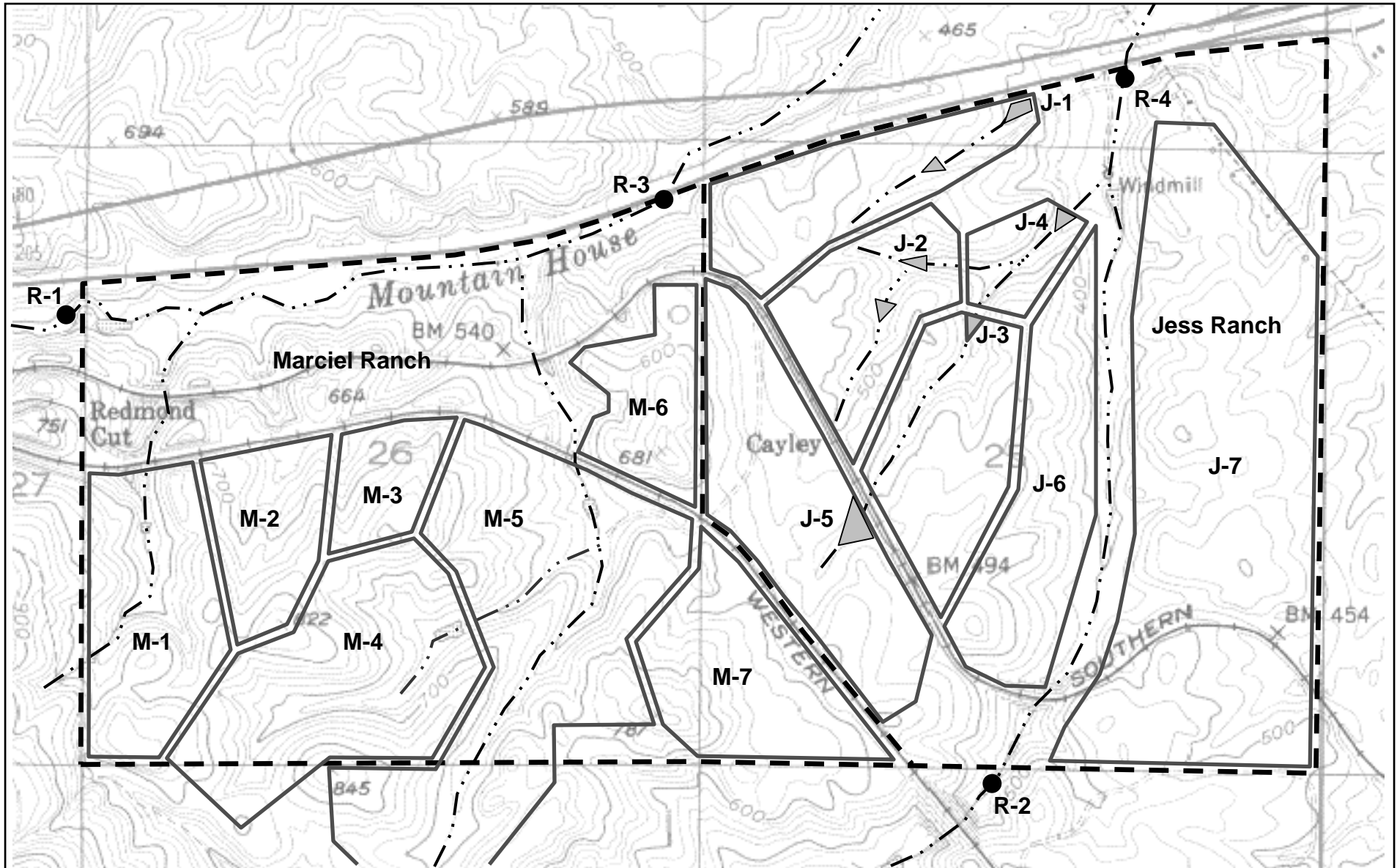
VICINITY MAP
BIOSOLIDS RECYCLING, INC.
JESS RANCH AND MARCIEL RANCH
ALAMEDA COUNTY

ORDER NO. R5-2006-0071



Approx. Scale: 1" = 1,600'

ATTACHMENT B



Drawing Reference:
 Report of Waste Discharge
 Biosolids Recycling, Inc.
 December 2004 and
 August 2005

DRAINAGE MAP
 BIOSOLIDS RECYCLING, INC.
 JESS RANCH AND MARCIEL RANCH
 ALAMEDA COUNTY

ORDER NO. R5-2006-0071



Approx. Scale:
 1" = 1,200'

- Site Boundary
- Drainage Area Boundary
- Drainage Course/Creek
- ▲ J-1 Storm Water Detention Pond
- R-1 Surface Water Sampling Location

**ATTACHMENT C
REQUIREMENTS FOR
PRELIMINARY GROUNDWATER DEPTH ASSESSMENT
WORKPLAN AND REPORT**

Prior to the field investigation, the Dischargers shall submit a workplan containing, at a minimum, the information listed in Section 1 below. The work may proceed after staff approves the workplan. Upon completion of the field exploration, the Dischargers shall submit a report that includes the information contained in Section 2 below. All workplans 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 - Preliminary Groundwater Depth Assessment Workplan

The workplan shall contain the following minimum information:

- A. General Information:
 - Purpose of the project
 - Brief description of local geologic and hydrogeologic conditions
 - Proposed drilling location(s) and rationale for selection
 - Topographic map showing facility location, roads, all existing on-site wells, proposed exploratory boring, surface drainage courses, surface water bodies

- B. Drilling Details:
 - County permit
 - On-site supervision of drilling
 - Description of drilling equipment and techniques
 - Equipment decontamination procedures
 - Soil sampling intervals (if appropriate) and logging methods
 - Procedure for determining whether the boring intersects the shallow water table
 - Procedure for abandoning the boring

- F. Schedule for completion of field work

SECTION 2 - Preliminary Groundwater Depth Assessment Report

The report must provide the information listed below. In addition, the report must also clearly identify, describe, and justify any deviations from the approved workplan.

- A. General Information:
 - Purpose of the project
 - Brief description of local geologic and hydrogeologic conditions encountered during drilling
 - County boring and abandonment permit (if required)
 - Topographic map showing facility location, roads, all existing on-site wells, exploratory boring location(s), surface drainage courses, surface water bodies

- 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. Boring abandonment procedures

**ATTACHMENT D
REQUIREMENTS FOR
MONITORING WELL INSTALLATION WORKPLANS AND
MONITORING WELL INSTALLATION REPORTS**

Prior to installation of groundwater monitoring wells, the Discharger shall submit a workplan containing, at a minimum, the information listed in Section 1 below. Wells may be installed after staff approves the workplan. Upon installation of the monitoring wells, the Discharger shall submit a well installation report that includes the information contained in Section 2 below. All workplans 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 Workplan and
Groundwater Sampling and Analysis Plan**

The monitoring well installation workplan 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 workplan, 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 workplan.

- 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