

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. R5-2004-0078

WASTE DISCHARGE REQUIREMENTS

FOR
LINNE ESTATES, LLC
LINNE ESTATES WASTEWATER TREATMENT SYSTEM
SAN JOAQUIN COUNTY

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

1. On 2 December 2003, Linne Estates, LLC (hereafter Discharger) submitted a Report of Waste Discharge (RWD) for a new wastewater treatment system to treat and dispose of domestic wastewater generated by homes in the proposed Linne Estates residential development. Upon acceptance of the completed plant by the San Joaquin County Board of Supervisors, the facility will be owned and operated by the San Joaquin County Department of Public Works.
2. The facility is at 7701 Nates Road, Tracy in Section 3, T3S, R5E, MDB&M as shown on Attachment A, which is attached hereto and made part of this Order by reference. Linne Estates and the wastewater treatment system are on several parcels. The Assessor's Parcel Numbers are 248-080-14, 16, 17, 20, 22, 33, 34, and 248-090-09.
3. Linne Estates is a 78-acre residential subdivision with 150 residential parcels. Each residence will be constructed with three or four bedrooms. No commercial development is included in the subdivision; therefore, no industrial wastewater will be discharged to the treatment system.
4. The Discharger will own and operate the wastewater system and is responsible for its proper design, operation, and maintenance.

Treatment System and Discharge

5. The wastewater collection system will be a gravity system with two pumping stations. Piping will be gasketed to minimize leakage and infiltration.
6. The wastewater treatment plant was sized based on the San Joaquin County Environmental Health Department's Sewage Standard Ordinance. The ordinance is consistent with U.S. Environmental Protection Agency guidelines and other published values. A total flow of approximately 52,500 gallons per day (gpd) is anticipated based on 350 gpd per residence.
7. The wastewater treatment system is sized for a flow rate of 55,000 gpd. Wastewater treatment will be performed using activated sludge in a batch treatment process. Wastewater will be partially denitrified, disinfected, and discharged to shallow emitters. A treatment schematic is presented on Attachment B, which is attached hereto and made part of this Order by reference.
8. After preliminary screening, wastewater may be diverted to emergency storage, consisting of two buried tanks that provide 60,000 gallons of storage. Normally, wastewater will flow from the

screening to an Influent Equalization System (IES), which consists of a 24,000 gallon buried tank. The IES will be aerated with diffused air to maintain aerobic conditions and prevent nuisance odor conditions.

9. Wastewater will then flow to an aeration tank, which is a 40,000 gallon buried tank that is equipped with air diffusers to provide aerobic treatment. The aeration tank will be equipped with a continuous dissolved oxygen control system. Wastewater is pumped from the aeration tank to either the batch clarifier or the anoxic denitrification system.
10. The anoxic denitrification system is a 20,000 gallon buried tank which will receive nitrified activated sludge mixed liquor to reduce dissolved oxygen concentrations for denitrification. The tank will be equipped with a mixing system and continuous dissolved oxygen concentration metering.
11. The batch clarifier is a 16,000 gallon buried tank. The clarifier will provide sedimentation and additional denitrification. Clarified effluent will be transferred to the filtration system. Settled sludge will either be pumped to the aeration tank or the aerobic sludge digesters.
12. Treated wastewater will be filtered through a multi-media pressure filtration system. The filters contain silica sand, garnet, and anthracite coal. Filter backwash water will be diverted back into the equalization tank for retreatment.
13. After filtration, the wastewater will enter the ozone contact chamber, which is a 5,000 gallon buried tank. Ozone will be generated on-site as needed. The disinfection will be operated in a batch mode. A liquid chlorine backup system will also be available.
14. Filtered and disinfected wastewater will be stored in a 9,000 gallon buried effluent-pumping tank prior to discharge to the dispersal area.
15. Waste activated sludge will be discharged to a 16,000 gallon buried aerobic digestion tank and periodically pumped for off-site disposal.
16. Treated wastewater will be discharged to a 1.7 acre dispersal area through a computer controlled emitter system. Emitters will be grouped into six zones. Moisture sensors located in the dispersal area will allow monitoring of soil moisture and will change the application of wastewater to prevent over application of wastewater and saturated soil conditions. Turf grass will be grown in the dispersal area. The grass will be mowed and the clippings removed from the dispersal area.
17. On 29 July 2003, Kleinfelder, Inc. performed percolation tests at the dispersal area. Based on the calculated infiltration rate (9 min/inch) presented in the 22 September 2003 Geotechnical Services Report, use of an 8-percent safety factor (as recommended by U.S. EPA), and the disposal area available, the volume of wastewater to be applied consists of approximately 9.3-percent of the available hydraulic capacity of the dispersal area.
18. Both good practice and Section 3.3.2.b of the San Joaquin County Public Health Services Environmental Health Division Sewage Standards requires that 100-percent of open land equal to

the size of the installed sewage system be available for future use if needed. The facility complies with this requirement. The replacement area is identified on Attachment C, which is attached hereto and made part of this Order by reference.

19. Untreated wastewater quality was estimated from published sources and is presented below:

| <u>Constituent</u> | <u>Units</u> | <u>Concentration</u> |
|---------------------------|--------------|----------------------|
| Biochemical Oxygen Demand | mg/L | 240 |
| Total Suspended Solids | mg/L | 218 |
| Total Nitrogen | mg/L | 34 |

20. The RWD presents anticipated treated wastewater quality. The projected effluent quality is presented below:

| <u>Constituent</u> | <u>Units</u> | <u>Concentration</u> |
|---------------------------|--------------|----------------------|
| Biochemical Oxygen Demand | mg/L | 15 |
| Total Suspended Solids | mg/L | 15 |
| Total Nitrogen | mg/L | 12 |
| Total Coliform Organisms | mpn/100 ml | 23 |
| Total Dissolved Solids | mg/L | 810 |
| pH | Std. Units | 7 - 8 |

Collection System

21. A collection system “overflow” is a discharge to ground surface or to surface water from the collection system, wastewater treatment system, or disposal area. Temporary storage or collection facilities may be utilized during maintenance operations and discharges to these facilities are not considered overflow events, provided that the waste is fully contained and properly disposed of.
22. Potential causes of overflows within this system include grease blockages, root blockages, debris blockages, sewer line flood damage, vandalism, storm or groundwater inflow/infiltration, lack of capacity, power failures, and contractor caused blockages.
23. Sanitary sewer overflows often contain high levels of suspended solids, pathogenic organisms, nutrients, oxygen demanding organic compounds, oil and grease, and other wastes. Sanitary sewer overflows can cause temporary exceedences of applicable water quality objectives, pose a threat to public health, adversely affect aquatic life, and impair the public recreational use and aesthetic enjoyment of surface waters in the area.
24. The Discharger is expected to take all necessary steps to adequately maintain and operate, and thereby prevent overflows from its collection system. A reasonable means to accomplish this is to update and implement a collection system operation and maintenance manual that includes overflow prevention and response features.

Groundwater Considerations

25. The development will be served by an on-site water supply well. The well is approximately 706 feet deep and the screened intervals are 542-582, 598-608, 632-642, and 666-706 feet below ground surface. The water quality of the well was tested on 3 September 1999. Water quality is presented in the table below:

| <u>Constituent</u> | <u>Units</u> | <u>Concentration</u> |
|------------------------|--------------|----------------------|
| Total Hardness | mg/L | 260 |
| Sodium | mg/L | 66 |
| Chloride | mg/L | 94 |
| Nitrate as N | mg/L | 4.6 |
| Total Dissolved Solids | mg/L | 610 |
| Specific Conductance | µmhos/cm | 930 |
| THMs ¹ | µg/L | ND(0.5) ² |

¹ THMs denotes trihalomethanes.

² ND denotes Not Detected (detection limit shown in parentheses).

26. Three groundwater monitoring wells were installed on 27, 28, and 29 August 2003 in the dispersal area, as shown on Attachment C. Based on data collected on 11 September 2003 and 29 December 2003, the groundwater exists approximately 50 feet below the ground surface and flows to the northwest under a gradient of 0.001 ft./ft. Well MW-1 is likely to be established as the well upgradient of the dispersal area. Groundwater samples were collected and analyzed. A summary of the average groundwater quality is presented below:

| <u>Well</u> | <u>NO₃ as N</u> (mg/L) | <u>Chlorid</u> <u>e</u> (mg/L) | <u>TDS</u> (mg/L) | <u>VDS</u> (mg/L) | <u>SC</u> (µmhos/cm) | <u>TCO</u> (mpn/100 ml) | <u>FCO</u> (mpn/100 ml) |
|-------------|--------------------------------------|--------------------------------------|----------------------|----------------------|-------------------------|----------------------------|----------------------------|
| MW-1 | 20 | 326 | 1280 | 275 | 1805 | ND (2) | ND (2) |
| MW-2 | 13.2 | 335 | 1195 | 230 | 1755 | ND (2) | ND (2) |
| MW-3 | 14 | 319.5 | 1180 | 310 | 1730 | ND (2) | ND (2) |

NO₃ as N denotes Nitrate as Nitrogen. TDS denotes Total Dissolved Solids.

VDS denotes Volatile Dissolved Solids. SC denotes Specific Conductance.

TCO denotes Total Coliform Organisms. FCO denotes Fecal Coliform Organisms.

ND denotes Not Detected, detection limit shown in parentheses.

27. The groundwater monitoring wells were installed prior to finalization of the wastewater system plans. As a result, the wells do not adequately monitor the dispersal area. Additional wells are required by this Order to improve the groundwater monitoring network.

Site Specific Conditions

28. The 100 year return annual total rainfall, based on data from Tracy Pump weather station, is 21.87 inches per year.

29. All portions of the development and wastewater treatment facility are outside of the 100-year flood zone.
30. Stormwater that falls on the site is collected and discharged to a stormwater storage pond.
31. The site lies within the San Joaquin Delta Hydrologic Unit, as depicted on interagency hydrologic maps prepared by the Department of Water Resources in August 1986.
32. According to the Soil Conservation Service's Soil Survey of San Joaquin County, surface soil at the wastewater treatment facility consists of Stomar clay loam alluvium derived from sedimentary rocks.
33. The topography of the site and surrounding area is fairly level. Elevation of the site is approximately 110 feet above mean sea level.

Basin Plan, Beneficial Uses, and Regulatory Considerations

34. 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 Water Resources Control Board. Pursuant to Section 13263(a) of the CWC, waste discharge requirements must implement the Basin Plan.
35. Surface water drainage from the site is to the San Joaquin Delta.
36. The Basin Plan establishes numerical and narrative water quality objectives for surface water and groundwater within the basin. Numerical water quality objectives are maximum limits directly applicable to the protection of designated beneficial uses of the water. The Basin Plan requires that the Regional Board, on a case-by-case basis, follow specified procedures to determine maximum numerical limitations that apply the narrative objectives when it adopts waste discharge requirements.
37. The Basin Plan includes a water quality objective for Chemical Constituents that, at a minimum, requires waters designated as domestic or municipal supply to meet the maximum contaminant levels (MCLs) specified in the following provisions of Title 22, California Code of Regulations: Tables 64431-A (Inorganic Chemicals) and 64431-B (Fluoride) of Section 64431, Table 64444-A (Organic Chemicals) of Section 64444, Table 64449-A (Secondary Maximum Contaminant Levels-Consumer Acceptance Limits) of Section 64449, and 64449-B (Secondary Maximum Contaminant Levels-Ranges) of Section 64449. The Basin Plan's incorporation of these provisions by reference is prospective, and includes future changes to the incorporated provisions as the changes take effect. The Basin Plan recognizes that that the Regional Board may apply limits more stringent than MCLs to ensure that waters do not contain chemical constituents in concentrations that adversely affect beneficial uses.
38. The Basin Plan contains narrative water quality objectives for Chemical Constituents, Tastes and Odors, and Toxicity. The Toxicity objective, in summary, requires that groundwater be

maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life associated with designated beneficial uses. The Chemical Constituents objective requires that groundwater “shall not contain chemical constituents in concentrations that adversely affect beneficial uses.” The Tastes and Odors objective requires that groundwater “shall not contain taste- or odor-producing substances in concentrations that cause nuisance or adversely affect beneficial uses.” Chapter IV, Implementation, of the Basin Plan contains the “Policy for Application of Water Quality Objectives.” This Policy specifies, in part, that compliance with narrative water quality objectives may be evaluated considering numerical criteria and guidelines developed and/or published by other agencies and organizations.

39. CWC Section 13241 requires the Regional Board to consider various factors, including economic considerations, when adopting water quality objectives into its Basin Plan. CWC Section 13263 requires the Regional Board to address the factors in Section 13241 in adopting waste discharge requirements. The State Board, however, has held that a Regional Board need not specifically address the Section 13241 factors when implementing existing water quality objectives in waste discharge requirements because the factors were already considered in adopting water quality objectives. The interim groundwater limitations implement adopted water quality objectives in the manner prescribed by the Basin Plan. No additional analysis of Section 13241 factors is required.
40. The beneficial uses of the San Joaquin Delta are municipal and domestic supply; agricultural supply; industrial process supply; industrial service supply; water contact recreation; noncontact water recreation; warm freshwater habitat, cold freshwater habitat; migration of aquatic organisms; spawning, reproduction, and/or early development; wildlife habitat; and navigation.
41. The beneficial uses of underlying groundwaters are municipal and domestic supply, industrial service supply, industrial process supply, and agricultural supply.

Groundwater Degradation

42. State Board Resolution No. 68-16 (“Statement of Policy with Respect to Maintaining High Quality of Waters of the State”) (hereafter Resolution No. 68-16) requires the Regional Board in regulating the discharge of waste to maintain high quality waters of the state until it is demonstrated that any change in quality will be consistent with maximum benefit to the people of the State, will not unreasonably affect beneficial uses, and will not result in water quality less than that described in the Regional Board’s policies (e.g., quality that that does not conform to water quality objectives). In addition, Resolution No. 68-16 requires that discharges of waste to existing high quality waters “be required to meet waste discharge requirements which will result in the best practicable treatment or control of the discharge necessary to assure that (a) pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the State will be maintained.”

43. Some degradation of groundwater beneath the wastewater treatment facility can be found consistent with Resolution No. 68-16 provided that:
 - a. The degradation is limited in area;
 - b. The discharger minimizes the degradation by fully implementing, regularly maintaining, and optimally operating best practicable treatment and control (BPTC) measures;
 - c. The degradation is limited to waste constituents typically encountered in domestic wastewater as listed in the groundwater limitations in this Order; and
 - d. The degradation does not result in water quality less than that prescribed in the Basin Plan.
44. Some degradation of groundwater by some of the typical waste constituents released with a discharge from a domestic wastewater treatment plant (after effective source control, treatment, and control) that provides utility service for a public institution is consistent with maximum benefit to the people of California. Degradation of groundwater by waste constituents (e.g., toxic chemicals) other than those specified in the groundwater limitations in this Order, and by waste constituents that can be effectively removed by conventional treatment and soil attenuation (e.g., total coliform bacteria) is not of maximum benefit. When allowed, the degree of degradation permitted depends upon many factors (i.e., natural background water quality, the waste constituent, the beneficial uses and most stringent water quality objective, source control measures, and waste constituent treatability).
45. Economic prosperity of local communities and associated industry is of benefit to the people of California, and therefore sufficient reason exists to accommodate growth and some groundwater degradation around the wastewater treatment facility, provided that the terms of the Basin Plan are met.

Treatment and Control Practices

46. This wastewater treatment facility provides treatment and control of the discharge that includes advanced treatment, and evaporation, percolation, and plant uptake as disposal methods.
47. Wastes that pass through the treatment system are discharged to the dispersal area; the soil then treats some of the remaining wastes. The amount of treatment depends on the waste type and concentrations, soil type and depth, percolation rates, wastewater application rates, and depth to groundwater. Some waste constituents may migrate through the soil column to the underlying groundwater. Groundwater monitoring is appropriate and necessary to monitor the effectiveness of treatment within the soil column and assure groundwater quality consistent with terms specified herein.
48. The impact on groundwater and the appropriate level of degradation that would comply with Resolution 68-16 have not been fully evaluated. The Discharger's current treatment and control may not constitute BPTC as intended by Resolution No. 68-16 for the following reasons, and groundwater degradation, if any, from the characterized wastewater may not be found consistent with Resolution No. 68-16:

- a. The dispersal area provides minimal area for waste application.
 - b. Source control (prohibition of water softeners) may not be implemented in all residences.
49. This Order establishes interim groundwater limitations for the WWTF that will not unreasonably threaten beneficial uses or result in groundwater quality that exceeds water quality objectives set forth in the Basin Plan. This Order contains tasks for assuring that BPTC and the highest water quality consistent with the maximum benefit to the people of the State will be achieved. Accordingly, the discharge is consistent with Resolution 68-16. Based on the results of the scheduled tasks, the Regional Board may reopen this Order to reconsider groundwater limitations and other requirements to comply with Resolution 68-16.

Other

50. The State Water Resources Control Board adopted Order No. 97-03-DWQ (General Permit No. CAS000001) specifying waste discharge requirements for discharges of stormwater associated with industrial activities, and requiring submittal of a Notice of Intent by all affected industrial dischargers. Because there is no stormwater discharge, the Discharger is not required to obtain coverage under General Permit No. CAS000001.
51. On 15 May 2003, the San Joaquin County Community Planning Commission adopted a Negative Declaration for this project pursuant to the provisions of the California Environmental Quality Act (CEQA), in accordance with Title 14, California Code of Regulations (CCR), Section 15301. Implementation of this Order should assure that there will be no adverse environmental impacts from the discharge.
52. Section 13267(b) of the CWC 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 having discharged or discharging, or who proposes to discharge waste within its region, or any citizen or domiciliary, or political agency or entity of this state who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge, waste outside of its region that could affect the quality of waters within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the regional board requires. The burden, including costs, of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports. In requiring those reports, the regional board shall provide the person with a written explanation with regard to the need for the reports, and shall identify the evidence that supports requiring that person to provide the reports.*

The technical reports required by this Order and the attached "Monitoring and Reporting Program No. R5-2004-0078" are necessary to assure compliance with these waste discharge requirements. The Discharger owns and operates the facility that discharges waste subject to this Order.

53. The California Department of Water Resources sets standards for the construction and destruction of groundwater wells, as described in *California Well Standards Bulletin 74-90* (June 1991) and *Water Well Standards: State of California Bulletin 94-81* (December 1981). These standards, and

any more stringent standards adopted by the State or County pursuant to CWC section 13801, apply to all monitoring wells.

54. State regulations that prescribe procedures for detecting and characterizing the impact of waste constituents from waste management units on groundwater are found in Title 27, CCR, section 20005, et seq. (hereafter Title 27). While the wastewater system is exempt from Title 27, the data analysis methods of Title 27 may be appropriate for determining whether the discharge complies with the terms for protection of groundwater specified in this Order.
55. The discharge authorized herein and the treatment and storage facilities associated with the discharge, except for discharges of residual sludge and solid waste, are exempt from the requirements of Title 27. The exemption, pursuant to Title 27 section 20090(a), is based on the following:
 - a. The waste consists primarily of domestic sewage and treated effluent;
 - b. The waste discharge requirements are consistent with water quality objectives; and
 - c. The treatment and storage facilities described herein are comparable in function to a municipal wastewater treatment plant.
56. Pursuant to CWC section 13263(g), discharge is a privilege, not a right, and adoption of this Order does not create a vested right to continue the discharge.

Public Notice

57. 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.
58. The Discharger and interested agencies and persons were notified of the intent to prescribe waste discharge requirements for this discharge, and provided an opportunity to submit written views and recommendations and to be heard in a public meeting.
59. In a public meeting, all comments pertaining to the discharge were heard and considered.

IT IS HEREBY ORDERED that, pursuant to CWC sections 13263 and 13267, Linne Estates, LLC, its agents, successors, and assigns, in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted hereunder, 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. Discharge of wastes to surface waters or surface water drainage courses is prohibited.
2. Bypass or overflow of untreated or partially treated waste is prohibited.
3. Surfacing or spillage of wastewater at the treatment system or in the dispersal area is prohibited.
4. Discharge of waste classified as 'hazardous' under Title 23, CCR, Section 2521, or as 'designated' under CWC Section 13173 is prohibited, including any discharge of sludge.
5. Wastewater disposal occurring closer than 150 feet from a public well or 100 feet from all other wells are prohibited. Wells installed under the supervision of a California licensed Engineer or Geologist for the purpose of monitoring the effect of wastewater disposal on groundwater quality are exempted from this prohibition.
6. Discharge of waste at this new facility is prohibited until the Discharger has submitted the report required by Provision No. E.1.a.

B. Discharge Specifications

1. The monthly average flow shall not exceed 55,000 gallons per day.
2. The wastewater treatment and disposal area shall not cause pollution or a condition of nuisance as defined by Section 13050 of the California Water Code.
3. Public contact with wastewater at the treatment plant and in the disposal area shall be precluded or controlled through such means as fences, signs, or acceptable alternatives.
4. 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.
5. Objectionable odor originating from the treatment and disposal system shall not be perceivable beyond the limits of the treatment and disposal system's area.
6. All treatment, storage, and disposal areas shall be designed, constructed, operated, and maintained to prevent inundation or washout due to floods with a 100-year return frequency.
7. Application of wastewater shall be confined to the dispersal area defined in this Order.
8. The Discharger shall operate all systems and equipment to maximize treatment of wastewater and optimize the quality of the discharge.

9. The Discharger shall remove vegetation in the dispersal area as needed to prevent threat of root intrusion into the system and to remove wastewater constituents taken up by the vegetation.
10. The wastewater treatment system shall have sufficient treatment, storage, and disposal capacity to accommodate allowable wastewater flow, inflow and infiltration, and design seasonal precipitation during the winter months. Design seasonal precipitation shall be based on total annual precipitation using a return period of 100 years, distributed monthly in accordance with historical rainfall patterns.
11. Installation of all treatment system equipment shall be performed in accordance with the requirements of this Order and the San Joaquin County Environmental Health Department Sewage Standards.

C. General Solids Disposal Specifications

Sludge means the solid, semisolid, and liquid residues removed during primary, secondary, or advanced wastewater treatment processes. Solid waste refers to grit and screenings generated during preliminary treatment. Residual sludge means sludge that will not be subject to further treatment at the facility.

1. Sludge and solid waste shall be removed from screens, tanks, clarifiers, etc. as needed to ensure optimal plant operation.
2. Treatment and storage of sludge shall be confined to the treatment facility property, and shall be conducted in a manner that precludes infiltration of waste constituents into soils in a mass or at concentrations that will violate the Groundwater Limitations of this Order.
3. Any storage of residual sludge or solid waste at the facility shall be temporary, and the waste shall be controlled and contained in a manner that minimizes leachate formation and precludes infiltration of waste constituents into soils in a mass or at concentrations that will violate the Groundwater Limitations of this Order.
4. Residual sludge and solid waste shall be disposed of in a manner approved by the Executive Officer and consistent with Title 27 CCR, Division 2, Subdivision 1. Removal for further treatment, disposal, or reuse at disposal sites operated in accordance with valid waste discharge requirements issued by a regional water quality control board will satisfy this specification.

D. Groundwater Limitations

1. Release of waste constituents from any wastewater treatment or storage system component associated with the WWTF shall not cause groundwater under and beyond that system component, as determined by an approved well monitoring network, to:
 - a. Contain any of the following constituents in concentrations greater than the water quality limitations or background groundwater quality limitations, whichever is

greater:

| <u>Constituent</u> | <u>Units</u> | <u>Water Quality Limitation</u> | <u>Background Groundwater Limitation</u> |
|-------------------------------------|--------------|---------------------------------|--|
| Ammonia (as NH ₄) | mg/L | 1.5 | |
| Boron | mg/L | 0.7 | |
| Chloride | mg/L | 106 | 326 |
| Iron | mg/L | 0.3 | |
| Manganese | mg/L | 0.05 | |
| Sodium | mg/L | 69 | |
| Total Coliform Organisms | MPN/100 mL | <2.2 ¹ | <2.2 |
| Total Dissolved Solids ² | mg/L | 450 | 1280 |
| Total Nitrogen | Mg/L | 10 | |
| Nitrite (as N) | mg/l | 1.0 | |
| Nitrate (as N) | mg/L | 10 | 20 |
| Bromoform | ug/L | 4 | |
| Bromodichloromethane | ug/L | 0.27 | |
| Chloroform | ug/L | 1.1 | |
| Dibromochloromethane | ug/L | 0.37 | |

¹ As measured over any seven day period.

² A cumulative impact limit that accounts for several dissolved constituents in addition to those listed here separately [e.g., alkalinity (carbonate and bicarbonate), calcium, hardness, phosphate, and potassium].

- b. Exhibit a pH of less than 6.5 or greater than 8.4 pH units.
- c. Impart taste, odor, toxicity, or color that creates nuisance or impairs any beneficial use.

E. Provisions

1. All of the following reports shall be submitted pursuant to Section 13267 of the California Water Code and shall be prepared by a registered professional as described by Provision F.2.
 - a. **At least 10 days prior to start-up of the WWTF**, the Discharger shall submit a report certifying completion of WWTF that the system is ready to begin treating wastewater. The report shall show the treatment plant and disposal area layout, and shall clearly document any significant deviation from the system design as presented in the RWD.
 - b. **Within 30 days of start-up of the WWTF**, the Discharger shall submit as-built drawings which are signed and stamped by a California registered engineer.
 - c. By **26 August 2004**, the Discharger shall submit and implement an Operation and Maintenance (O&M) Plan for the wastewater system. The O&M Plan shall instruct

field personnel on how to manage the day-to-day discharge operations to comply with the terms and conditions of this Order and how to make field adjustments, as necessary, to optimize the effectiveness and life of the dispersal area and preclude nuisance conditions (e.g., surfacing wastewater). It shall also include a troubleshooting flowchart with recommended remedial actions and a description of notification requirements. The O&M Plan shall address management of the wastewater system in sufficient detail to optimize compliance with this Order. The Discharger shall ensure that an up-to-date O&M Plan is readily available to operating personnel at all times, and that personnel are familiar with it.

- d. By **26 August 2004**, the Discharger shall submit a *Collection System Operation, Maintenance, Overflow Prevention, and Response Plan* (CSR Plan) that describes the actions designed to prevent or minimize the potential for overflows. The Discharger shall maintain the CSR Plan in an up-to-date condition and shall amend the CSR Plan whenever there is a change (e.g., in the design, construction, operation, or maintenance of the collection system) that materially affects the potential for overflows, or whenever there is an overflow. The Discharger shall ensure that the up-to-date CSR Plan is readily available to operating personnel at all times and that the personnel are familiar with it.
- i. At a minimum, the operation and maintenance portion of the CSR Plan shall contain or describe the following:
 1. Detailed maps of the collection system;
 2. A detailed listing of elements to be inspected, a description of inspection procedures and inspection frequency, and sample inspection forms;
 3. A schedule for routine inspection of all pipelines, valves, and other key system components. The inspection/testing program shall be designed to reveal problems that might lead to accidental spills and ensure that preventive maintenance is completed;
 4. Provisions for repair or replacement of defective equipment.
 - ii. At a minimum, the overflow prevention and response portion of the CSR Plan shall contain or describe the following:
 1. Identification of areas of the collection system that historically have overflowed and an evaluation of the cause of the overflow;
 2. Maintenance activities that can be implemented to address the cause of the overflow and means to prevent future overflows;
 3. Procedures for responding to overflows designed to minimize the volume of overflow that enters surface waters, and minimize the adverse effects of overflows on water quality and beneficial uses; and
 4. Steps to be taken when an overflow or spill occurs, and procedures that will be implemented to ensure that all overflows and spills are properly identified, responded to and reported to appropriate agencies, and if necessary, the public.

- e. By **26 August 2004**, the Discharger shall submit a workplan for the characterization of groundwater quality at the disposal area. The workplan shall describe the locations of existing wells, data on the groundwater flow direction, and installation of additional wells to adequately characterize background water quality and potential groundwater impacts from the wastewater discharge. Every monitoring well shall be constructed to yield representative samples from the uppermost layer of the uppermost water bearing zone 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, including a Groundwater Sampling and Analysis Plan.
 - f. By **24 November 2004**, the Discharger shall submit a groundwater well installation report. The report shall be consistent with, and include the items listed in, the second section of Attachment D.
 - g. By **15 October 2005**, the Discharger shall submit a *Groundwater Quality Study Report*. For each groundwater monitoring parameter/constituent identified in the Monitoring and Reporting Program, the report shall present a summary of monitoring data from each monitoring well. Determination of groundwater quality shall be made using the methods described in Title 27, Section 20415(e)(10), and data from at least four consecutive quarterly (or more frequent) groundwater monitoring events.
 - h. If the *Groundwater Quality Study Report* shows that groundwater exceeds Groundwater Limitations, then within **120 days** of the Executive Officer's request, the Discharger shall submit a technical report in the form of a *Wastewater System Evaluation Report and Implementation Workplan*. The technical report shall include a comprehensive evaluation of treatment and control measures that address full mitigation of the source of the exceedance(s). The report shall describe treatment and control alternatives studied, the alternative(s) recommended for implementation, and any specific methods the Discharger proposes to monitor and assure continuous optimal performance, the source of funding, and proposed schedule for implementation. The recommended improvements and implementation schedule are subject to the Executive Officer's approval, but the schedule for full implementation shall be as short as practicable and not exceed two years unless specifically approved by the Regional Board.
2. In accordance with California Business and Professions Code sections 6735, 7835, and 7835.1, engineering and geologic evaluations and judgments shall be performed by or under the direction of registered professionals competent and proficient in the fields pertinent to the required activities. All technical reports specified herein that contain workplans for, that describe the conduct of investigations and studies, or that contain technical conclusions and recommendations concerning engineering and geology shall be prepared by or under the direction of appropriately qualified professional(s), even if not explicitly stated. Each technical report submitted by the Discharger shall contain a statement of qualifications of the responsible licensed professional(s) as well as the professional's signature and/or stamp of the seal.
 3. The Discharger shall comply with the Monitoring and Reporting Program No. R5-2004-0078, which is part of this Order, and any revisions thereto as ordered by the Executive Officer.

4. The Discharger shall comply with the "Standard Provisions and Reporting Requirements for Waste Discharge Requirements", dated 1 March 1991, which are attached hereto and made part of this Order by reference. This attachment and its individual paragraphs are commonly referenced as "Standard Provision(s)." .
5. The Discharger shall use the best practicable treatment and control techniques, including proper operation and maintenance, to assure compliance with terms of this Order.
6. In event of overflow from the collection system, the Discharger shall take all necessary remedial action to control and limit the volume of wastewater discharged, and terminate the overflow as rapidly as possible. Necessary remedial actions may include, but are not limited to, the following:
 - a. Interception and rerouting of sewage flows around the collection line failure;
 - b. Vacuum truck recovery to the extent practical of sanitary sewer overflows and wash down water;
 - c. Cleanup of sewage-related debris at the overflow site;
 - d. Disinfection and posting of the area.
7. The Discharger shall report to the Regional Board any toxic chemical release data it reports to the State Emergency Response Commission within 15 days of reporting the data to the Commission pursuant to section 313 of the "Emergency Planning and Community Right to Know Act of 1986."
8. The Discharger shall not allow waste-free wastewater to be discharged into the wastewater collection, treatment, and disposal system. Waste-free wastewater means rainfall (roof gutters, yard drainage), groundwater, cooling waters, and condensates that are essentially free of wastes.
9. The Discharger 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 being reported, then the Discharge shall state the reasons for such noncompliance and provide an estimate of the date when the Discharger will be in compliance. The Discharger shall notify the Regional Board in writing when it returns to compliance with the time schedule.
10. In the event of any change in control or ownership of land or waste discharge facilities described herein, the Discharger shall notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be immediately forwarded to this office.
11. The Discharger must 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 recession of this Order.

12. A copy of this Order shall be kept at the facility for reference by operating personnel. Key operating personnel shall be familiar with its contents.
13. The Regional Board will review this Order periodically and will revise requirements when necessary.

I, THOMAS R. PINKOS, 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 4 June 2004.

THOMAS R. PINKOS, Executive Officer

TRO: 06/04/04

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2004-0078

FOR
LINNE ESTATES LLC
LINNE ESTATES WASTEWATER TREATMENT SYSTEM
SAN JOAQUIN COUNTY

This Monitoring and Reporting Program (MRP) describes requirements for monitoring domestic wastewater, treated effluent, the dispersal area, and groundwater. This MRP is issued pursuant to Water Code Section 13267. The Discharger shall not implement any changes to this MRP unless and until a revised MRP is issued by the Executive Officer. Regional Board staff shall approve specific sample station locations prior to implementation of sampling activities.

All samples should be representative of the volume and nature of the discharge or matrix of material sampled. The time, date, and location of each grab sample shall be recorded on the sample chain of custody form.

Field test instruments (such as those used to test pH and dissolved oxygen) 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. 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 this MRP.

The MRP is effective upon date of signature, and monthly monitoring reports are required as of the effective date. However, if the WTP is not yet constructed and no discharge of waste is occurring, then the Discharger shall submit monthly monitoring reports stating that the WTP is not yet operating, and shall describe the status of construction and anticipated start-up date.

INFLUENT MONITORING

The Discharger shall collect samples of the influent prior to treatment by the package plant. Influent monitoring shall include, at a minimum, the following:

| <u>Constituents</u> | <u>Units</u> | <u>Type of Sample</u> | <u>Sampling Frequency</u> | <u>Reporting Frequency</u> |
|---------------------------|--------------|-----------------------|---------------------------|----------------------------|
| Flow ¹ | gpd | Metered | Daily | Monthly |
| Biochemical Oxygen Demand | mg/L | Grab | Monthly | Monthly |

¹ Daily flow measurements shall be recorded to determine the volume of wastewater influent each day.

EFFLUENT MONITORING

The Discharger shall conduct effluent monitoring of the wastewater prior to discharge to the dispersal area. Effluent monitoring shall include, at a minimum, the following:

| <u>Constituents</u> | <u>Units</u> | <u>Type of Sample</u> | <u>Sampling Frequency</u> | <u>Reporting Frequency</u> |
|------------------------------------|--------------|-----------------------|---------------------------|----------------------------|
| Total Coliform Organisms | MPN/100 ml | Grab | Twice Monthly | Monthly |
| Nitrate as Nitrogen | mg/L | Grab | Twice Monthly | Monthly |
| Total Kjeldahl Nitrogen | mg/L | Grab | Twice Monthly | Monthly |
| PH | Std units | Grab | Twice Monthly | Monthly |
| Biochemical Oxygen Demand | mg/L | Grab | Monthly | Monthly |
| Total Dissolved Solids | mg/L | Grab | Monthly | Monthly |
| Means of Disinfection ¹ | NA | NA | NA | Monthly |
| Standard Minerals ² | mg/L | Grab | Annually | Annually |

¹ Means of Disinfection – The means of disinfection shall be stated in each monitoring report. Any use of chlorine during the reporting period shall be described.

² Standard Minerals shall include, at a minimum, the following elements and compounds: Boron, Calcium, Iron, Magnesium, Manganese, Sodium, Potassium, Chloride, Sulfate, Total Alkalinity (including alkalinity series), and Hardness.

DISPERSAL AREA MONITORING

The Discharger shall conduct a visual inspection of the dispersal area on a **weekly basis**. Evidence of surfacing wastewater, field saturation, runoff, or the presence of nuisance conditions shall be noted in the report. If surfacing wastewater is observed, the condition shall be immediately reported to Board staff and the need for system repair evaluated.

GROUNDWATER MONITORING

The Discharger shall immediately begin monitoring groundwater with the existing wells (i.e., beginning with the third quarter 2004). Prior to construction of any additional groundwater monitoring wells, the Discharger shall submit plans and specifications to the Board for review and approval. Once installed, all new wells shall be added to the MRP, and shall be sampled and analyzed according to the schedule below.

Prior to sampling, groundwater elevations shall be measured and the wells shall be purged at least three well volumes until pH and electrical conductivity have stabilized. Depth to groundwater shall be measured to the nearest 0.01 feet. Water table elevations shall be calculated. 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 Frequency³</u> |
|--------------------|--------------|-----------------------|---|
|--------------------|--------------|-----------------------|---|

| <u>Constituent</u> | <u>Units</u> | <u>Type of Sample</u> | <u>Sampling and Reporting Frequency³</u> |
|---------------------------------------|--------------|-----------------------|---|
| Groundwater Elevation ¹ | 0.01 Feet | Measurement | Quarterly |
| Depth to Groundwater | 0.01 Feet | Calculated | Quarterly |
| Gradient | Feet/Feet | Calculated | Quarterly |
| Gradient Direction | degrees | Calculated | Quarterly |
| PH | S.U. | Grab | Quarterly |
| Total Dissolved Solids | mg/L | Grab | Quarterly |
| Nitrate as Nitrogen | mg/L | Grab | Quarterly |
| Ammonia as Nitrogen | mg/L | Grab | Quarterly |
| Total Coliform Organisms ² | MPN/100 ml | Grab | Quarterly |
| Trihalomethanes ⁴ | ug/l | Grab | Quarterly |

¹ Groundwater elevation shall be based on depth to water 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 Beginning with the third quarter 2004

⁴ EPA Method 8020 or equivalent

REPORTING

In reporting monitoring data, the Discharger shall arrange the data in tabular form so that the date, sample type (e.g., effluent, groundwater, 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 supervision of a California licensed Registered Engineer or Geologist and signed 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 sampling** (i.e. the January Report is due by 1 March). At a minimum, the reports shall include:

1. If the treatment plant has not yet been constructed, the report shall so state and shall provide an anticipated schedule for construction.
2. If the treatment plant is operational, then:
 - A. Results of influent, effluent, and dispersal area monitoring;

- B. A comparison of monitoring data to the discharge specifications and an explanation of any violation of those requirements. Data shall be presented in tabular format;
- C. If requested by staff, copies of laboratory analytical report(s); and
- D. A calibration log verifying calibration of all hand held monitoring instruments and devices used to comply with the prescribed monitoring program.

B. Quarterly Report

The Discharger shall establish a quarterly sampling schedule for effluent monitoring and groundwater monitoring such that samples are obtained approximately every three months. 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 reports is due by May 1st), and may be combined with the monthly report. The Quarterly Report shall include the following:

1. Results of the groundwater monitoring.
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 a 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 monitoring.

C. Annual Report

An Annual Report shall be prepared as the fourth quarter monitoring report. The Annual Report will include all monitoring data required in the monthly/quarterly schedule. The Annual Report shall be submitted to the Regional Board by **1 February** each year. In addition to the data normally presented, the Annual Report shall include the following:

1. The contents of the regular quarterly monitoring report for the last quarter of the year;
2. If requested by staff, tabular and graphical summaries of all data collected during the year;
3. Results of effluent and groundwater annual monitoring;
4. A description of any activities to control vegetation in the dispersal area;
5. A statement of when the O&M Manual was last reviewed for adequacy, and a description of any changes made during the year;
6. A summary of maintenance and repairs activities which were performed on the collection system; and
7. A discussion of any 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.

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

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

Ordered by: _____
THOMAS R. PINKOS, Executive Officer

4 June 2004
(Date)

INFORMATION SHEET

ORDER NO. R5-2004-0078
LINNE ESTATES, LLC
LINNE ESTATES WASTEWATER TREATMENT SYSTEM
SAN JOAQUIN COUNTY

Background

Linne Estates is a proposed 78-acre residential subdivision that will contain 150 residential parcels. Linne Estates, LLC (hereafter Discharger) will construct a new wastewater treatment system to treat and dispose of domestic wastewater generated by homes in the residential development. Upon acceptance of the completed plant by the San Joaquin County Board of Supervisors, the facility will be owned and operated by the San Joaquin County Department of Public Works. The facility will be at 7701 Nates Road, Tracy.

Wastewater will be collected in a gravity collection system with two pumping stations. Piping will be gasketed to minimize leakage and infiltration. The wastewater treatment system is sized for a flow rate of 55,000 gpd. Wastewater treatment will be performed using activated sludge in a batch treatment process. Wastewater will be partially denitrified, disinfected, and then discharged to shallow emitters in a 1.7 acre dispersal area subdivided into six irrigation zones. Discharge of wastewater will be controlled using moisture sensors to prevent soil saturation and even distribution. Wasted sludge will be discharged to an aerobic digestion tank and pumped periodically for off-site disposal at the City of Tracy's wastewater treatment facility.

This Order requires the Discharger to prepare an As-Built Report, an Operation and Maintenance Plan, a Collection System O&M/Spill Response Plan, a Groundwater Well Installation Workplan, a Groundwater Well Installation Report, and a Groundwater Quality Study Report.

Basin Plan, Beneficial Uses, and Regulatory Considerations

Surface water drainage from the site is to the San Joaquin Delta. The *Water Quality Control Plan for the Sacramento River and San Joaquin River Basins, Fourth Edition* (Basin Plan), designates beneficial uses, establishes water quality objectives, and contains implementation plans and policies to achieve the objectives for all waters of the Basin. Beneficial use designations determine the water quality objectives that apply to a water body. For example, pursuant to the Chemical Constituents objective, waters designated as municipal and domestic supply must meet the maximum contaminant levels (MCLs) for drinking water. The Basin Plan sets forth the applicable beneficial uses (industrial process, industrial service, agricultural, and municipal and domestic supply in this instance) of groundwater, procedure for application of water quality objectives, and the process for and factors to consider in allocating waste assimilation capacity.

Antidegradation Policy (State Board Resolution No. 68-16)

State Board Resolution No. 68-16 ("Statement of Policy with Respect to Maintaining High Quality of Waters of the State") requires the Regional Board in regulating the discharge of waste to maintain high quality waters of the state until it is demonstrated that any change in quality will be consistent with maximum benefit to the people of the State, will not unreasonably affect beneficial uses, and will not result in water quality less than that described in the Regional Board's policies (e.g., quality that does not conform to water quality objectives). In addition, Resolution No. 68-16 requires that discharges of

waste to existing high quality waters “be required to meet waste discharge requirements which will result in the best practicable treatment or control of the discharge necessary to assure that (a) pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the State will be maintained.” Waters can be of high quality for some constituents or beneficial uses and not others. Policies and procedures for complying with this directive are set forth in the Basin Plan (including by reference State Board Resolution No. 68-16).

Resolution No. 68-16 is applied on a case-by-case, constituent-by-constituent basis in determining whether a certain degree of water quality degradation can be justified. It is incumbent upon the Discharger to provide technical information for the Regional Board to evaluate that fully characterizes:

- All waste constituents to be discharged;
- The background quality of the uppermost layer of the uppermost aquifer;
- The background quality of other waters that may be affected;
- The underlying hydrogeologic conditions;
- Waste treatment and control measures;
- How treatment and control measures are justified as best practicable treatment or control (BPTC);
- The extent the discharge will impact the quality of each aquifer; and
- The expected degree of degradation below water quality objectives.

The Regional Board must comply with California Water Code (CWC) Section 13263 in setting appropriate discharge conditions. The Regional Board is required, with respect to the waters of the State that may be affected by the discharge, to implement the Basin Plan and consider the beneficial uses to be protected along with the water quality objectives essential to protect those uses. The Regional Board need not authorize the full utilization of the waste assimilation capacity of the groundwater (CWC Section 13263(b)) and must consider other waste discharges and factors that affect that capacity.

The WWTF was not constructed when this Order was prepared. However, certain waste constituents in domestic wastewater are not fully amenable to waste treatment and control and it is reasonable to expect some impact on groundwater quality. Some degradation for certain constituents is consistent with maximum benefit to the people of California as residential housing and wastewater treatment facilities are a necessity and therefore provide a sufficient reason to accommodate increases in wastewater discharge provided terms of reasonable degradation are defined and met. The proposed Order authorizes some degradation consistent with the maximum benefit to the people of the State.

Three groundwater monitoring wells were installed in August 2003 in the dispersal area and two groundwater monitoring events have been performed. Based on data collected on 11 September 2003 and 29 December 2003, groundwater exists approximately 50 feet below the ground surface and flows to the northwest under a gradient of 0.001 ft/ft. Well MW-1 is likely to be established as the well upgradient of the dispersal area. A summary of the average groundwater quality is presented below:

| <u>Well</u> | <u>NO₃ as N</u> (mg/L) | <u>Chloride</u> (mg/L) | <u>TDS</u> (mg/L) | <u>VDS</u> (mg/L) | <u>SC</u> (µmhos/cm) | <u>TCO</u> (mpn/100 ml) | <u>FCO</u> (mpn/100 ml) |
|-------------|--------------------------------------|---------------------------|----------------------|----------------------|-------------------------|----------------------------|----------------------------|
| MW-1 | 20 | 326 | 1280 | 275 | 1805 | ND (2) | ND (2) |
| MW-2 | 13.2 | 335 | 1195 | 230 | 1755 | ND (2) | ND (2) |
| MW-3 | 14 | 319.5 | 1180 | 310 | 1730 | ND (2) | ND (2) |

NO₃ as N denotes nitrate as nitrogen. TDS denotes Total Dissolved Solids. VDS denotes Volatile Dissolved Solids. SC denotes Specific Conductance. TCO denotes Total Coliform Organisms. FCO denotes Fecal Coliform Organisms.

Although two groundwater sampling events have been performed, sufficient quarterly groundwater monitoring has not been conducted to establish the most appropriate groundwater limits. Reasonable time is necessary to gather specific information about the WWTF and the site to make informed, appropriate, long-term decisions. This proposed Order, therefore, establishes interim groundwater limitations at a concentration protective of the beneficial uses of groundwater of the State pending the Discharger's completion of certain tasks and provides time schedules to complete specified tasks. The Discharger is expected to identify, implement, and adhere to BPTC as individual practices are reviewed and upgraded in this process. During this period, degradation may occur from certain constituents, but is not authorized to exceed the interim groundwater limitations.

Water quality objectives define the least stringent limits that could apply as water quality limitations for groundwater at this location, except where natural background quality exceeds the objective. The values below are concentrations directly from the Basin Plan, or derived indirectly using Basin Plan procedures for implementation of narrative water quality objectives, and must be met to maintain specific beneficial uses of groundwater. They are based on numeric and narrative water quality objectives. Consistent with the Policy for Application of Water Quality Objectives in the Basin Plan, criteria of appropriate agencies have been used to implement narrative water quality objectives. Unless natural background for a constituent proves higher, the interim groundwater quality limitations established in the proposed Order are the most stringent of the values listed for the listed constituents.

| <u>Constituent</u> | <u>Units</u> | <u>Value</u> | <u>Beneficial Use</u> | <u>Criteria or Justification</u> |
|--------------------------|--------------|------------------|-----------------------|---|
| Ammonia | mg/L | 1.5 | MUN ¹ | Taste and Odor ² |
| Boron | mg/l | 0.7 | AGR ³ | Boron Sensitivity ⁴ |
| Chloride | mg/L | 106 | AGR ³ | Chloride sensitivity on certain crops irrigated via sprinklers ⁴ |
| | | 142 | AGR ³ | Chloride sensitivity on certain crops ⁴ |
| | | 250 | MUN ¹ | Recommended Secondary MCL ⁵ |
| | | 500 | MUN ¹ | Upper Secondary MCL ⁵ |
| Iron | mg/L | 0.3 | MUN ¹ | Secondary MCL ⁶ |
| Manganese | mg/L | 0.05 | MUN ¹ | Secondary MCL ⁶ |
| Nitrate as N | mg/L | 10 | MUN ¹ | Primary MCL ⁷ |
| Nitrite as N | mg/L | 1 | MUN ¹ | Primary MCL ⁷ |
| Total Nitrogen | mg/L | 10 | MUN ¹ | Primary MCL ¹¹ |
| Sodium | mg/L | 69 | AGR ³ | Sodium sensitivity on certain crops ⁴ |
| Total Dissolved Solids | mg/L | 450 ⁸ | AGR ³ | Salt sensitivity for certain crops ⁴ |
| | | 500 | MUN ¹ | Recommended Secondary MCL ⁵ |
| | | 1,000 | MUN ¹ | Upper Secondary MCL ⁵ |
| Total Coliform Organisms | MPN/100 | Less than | MUN ¹ | Basin Plan |

| <u>Constituent</u> | <u>Units</u> | <u>Value</u> | <u>Beneficial Use</u> | <u>Criteria or Justification</u> |
|----------------------|--------------|--------------|-----------------------|---|
| | ml | 2.2 | | |
| Trihalomethanes | µg/L | 80 | MUN ¹ | MCL ⁸ |
| Bromoform | µg/L | 4 | MUN ¹ | USEPA Cancer Potency Factor ⁹ |
| Bromodichloromethane | µg/L | 0.27 | MUN ¹ | Cal/EPA Cancer Potency Factor ¹⁰ |
| Chloroform | µg/L | 1.1 | MUN ¹ | Cal/EPA Cancer Potency Factor ¹⁰ |
| Dibromochloromethane | µg/L | 0.37 | MUN ¹ | Cal/EPA Cancer Potency Factor ¹⁰ |
| PH | pH Units | 6.5 to 8.5 | MUN ¹ | USEPA Secondary MCL ¹² |
| | | 6.5 to 8.4 | AGR ³ | Irrigation of crops ⁴ |

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- 1 Municipal and domestic supply.
 - 2 J.E. Amoores and E. Hautala, *Odor as an Aid to Chemical Safety : Odor Thresholds Compared with Threshold Limit Values and Volatilities for 214 Industrial Chemicals in Air and Water Dilution*, Journal of Applied Toxicology, Vol. 3, No. 6 (1983).
 - 3 Agricultural supply.
 - 4 Ayers, R. S. and D. W. Westcot, Water Quality for Agriculture, Food and Agriculture Organization of the United Nations – Irrigation and Drainage Paper No. 29, Rev. 1, Rome (1985).
 - 5 Title 22, California Code of Regulations (CCR), section 64449, Table 64449-B.
 - 6 Title 22, CCR, Section 64449, Table 64449-A.
 - 7 Title 22, CCR, Section 64431, Table 64431-A.
 - 8 Title 22, CCR, Section 64439.
 - 9 USEPA Integrated Risk Information System.
 - 10 Cal/EPA Toxicity Criteria Database (OEHHA).
 - 11 Assumes that, over time, all nitrate species will convert to nitrate or nitrite.
 - 12 40 Code of Federal Regulations 143.3

Municipal wastewater contains numerous dissolved inorganic waste constituents (i.e., salts, minerals) that together comprise Total Dissolved Solids (TDS). Each component constituent is not individually critical to beneficial use protection unless they are individually listed. The cumulative impact from these other constituents, along with the cumulative affect of the constituents that are individually listed can be effectively controlled using TDS as a generic indicator parameter.

Not all TDS constituents pass through the treatment process and soil profile in the same manner or rate. Chloride tends to pass through both rapidly to groundwater. Groundwater chloride concentrations in the region normally are much lower than in treated municipal wastewater; therefore, chloride is a useful indicator parameter for evaluating the extent to which effluent reaches groundwater. However, the limited data collected to date indicates chlorine exists at higher concentration than that expected in the discharge. Boron is another TDS constituent that may occur in wastewater in concentrations greater than natural background groundwater depending on the source water and to the extent residents use cleaning products containing boron. Other indicator constituents for monitoring potential groundwater degradation due to wastewater discharge includes total coliform bacteria, ammonia, total nitrogen, and Trihalomethanes (THMs) (by-products of chlorination). Since the WWTF uses ozone to disinfect the effluent, THMs are not included in the monitoring program or interim groundwater limitations. A backup chlorine system does exist and if chlorine is regularly used, the MRP will be modified to include THMs in effluent and groundwater monitoring. Dissolved iron and manganese are useful indicators to determine whether components of the WWTF with high-strength waste constituents are ineffective in containing waste. Exceptionally high TDS and nitrogen also typifies this type of release.

This Order assigns numeric groundwater limitations only for constituents anticipated to be present in the wastewater, known potential breakdown products of domestic wastewater, or known to potentially leach from soil as a result of domestic wastewater discharge to land.

Treatment Technology and Control

Selecting appropriate treatment and control technologies so that the soil underlying the disposal area can accept the residual waste constituent loading while preventing unacceptable levels of groundwater degradation is a critical aspect of land disposal system siting and design¹. Given the character of municipal wastewater, secondary treatment technology is generally sufficient to control degradation of groundwater from decomposable organic constituents when there is sufficient separation between the base of the land discharge area and the water table. Adding disinfection significantly reduces populations of pathogenic organisms, and significant layers of fine-grained soils in the vadose zone can reduce them further by filtration. Neither organics nor total coliform organisms, the indicator parameter for pathogenic organisms, should be found in groundwater beneath a well-sited, well-designed, well-operated facility.

Municipal wastewater typically contains nitrogen in concentrations greater than water quality objectives, which vary according to the form of nitrogen. Nitrogen concentrations can be controlled by an appropriate secondary treatment system to nitrify and denitrify the wastewater (e.g., oxidation ditch) or tertiary treatment for nitrogen reduction². Agronomic reuse of treated wastewater on harvested crops is an effective means to convert wastewater nitrogen into plant matter and nitrogen gas³. The effectiveness of these approaches varies, but one or more of them should be able achieve nitrogen concentrations in groundwater well below the water quality objectives. The proposed interim groundwater limitations for nitrogen are based on the water quality objectives and on background water quality.

Many waste constituents that are forms of salinity pass through conventional domestic wastewater treatment process unchanged except through evapoconcentration. Clay soils have a significant ability to assimilate some of the salinity through cation exchange, whereas sands and other soil types have relatively little⁴. However, in most cases, the combination of long term use of the dispersal area will ultimately overwhelm the natural attenuation capacity of the underlying soil. Therefore, effective control of long-term effects often relies upon effective source control and pretreatment measures. In the best of circumstances, long-term land discharge of treated municipal wastewater will degrade groundwater with salt (as measured by TDS and EC) and the individual components of salts (e.g., sodium, chloride). The proposed Order sets interim limits based on measured background water quality.

A discharge of wastewater that overloads soils with nutrients and organics can result in anaerobic conditions in the soil profile, creation of organic acids, and a decrease in soil pH. Under these

¹ USEPA Office of Research and Development, Manual of Wastewater Treatment and Disposal for Small Communities, EPA/625/R-92/006, Washington, D.C. (1992).

² Metcalf, and Eddy, Inc., Wastewater Engineering Treatment, Disposal and Reuse (3rd Ed.), McGraw-Hill, Inc., New York, (1991).

³ Brown and Caldwell, Kennedy Jenks, Komex H₂O Science, Manual of Good Practice for Land Application of Food Process/Rinse Water, California League of Food Processors, Sacramento (2003).

⁴ Dragun, James, The Soil Chemistry of Hazardous Materials, Hazardous Materials Control Research Institute, Silver Spring MD, (1988).

conditions, iron and manganese compounds in the soil can solubilize and leach into groundwater. Anaerobic conditions can also lead to the presence of ammonia in the groundwater. Such overloading is preventable through appropriate system design and operation. The proposed groundwater limitations for pH, iron, manganese, and ammonia apply the water quality objectives.

Title 27

Title 27 California Code of Regulations (CCR) Section 20005 et seq. ("Title 27"), contains regulations to address certain waste discharges to land for treatment, storage, processing, or disposal. Title 27 establishes a waste classification system, specifies siting and construction standards for full containment of designated and non-hazardous wastes, requires extensive monitoring of groundwater and the unsaturated zone for any indication of failure of containment, and specifies closure and post-closure maintenance requirements. Generally, no degradation of groundwater quality by any waste constituent is acceptable.

Discharges of domestic sewage and treated effluent can be treated and controlled to a degree that will not result in unreasonable degradation of groundwater. For this reason, they have been conditionally exempted from Title 27, except for the discharge to land of residual sludge and solid waste generated as part of the treatment process [Title 27 Section 20090(a)]. The conditions require that Waste Discharge Requirements (WDRs) have been issued or waived and that the discharge not result in violation of any water quality objective in groundwater.

Treatment and storage facilities for sludge that are part of the WWTF are considered exempt from Title 27 under Section 20090(a), under the condition that the facilities not result in a violation of any water quality objective. However, residual sludge (for the purposes of the proposed order, sludge that will not be subjected to further treatment by the WWTF is not exempt from Title 27. Solid waste (e.g., grit and screenings) that results from treatment of domestic sewage and industrial waste also is not exempt from Title 27. This residual sludge and solid waste are subject to the provisions of Title 27.

Accordingly, the municipal discharge of effluent and the operation of treatment or storage facilities associated with a municipal wastewater treatment plant can be allowed without requiring compliance with Title 27, but only if resulting degradation of groundwater is in accordance with all water quality objectives. The conditions for sludge, solid waste, and biosolids management proposed in this Order are intended to assure this be evaluated along with other aspects of BPTC, pursuant to Resolution No. 68-16.

Discharge Prohibitions and Specifications

The Report of Waste Discharge (RWD) and water balance states that the treatment system is adequate for the estimated flow of 55,000 gpd. This Order maintains the flow limit based on the RWD's description of the treatment system and dispersal area's capacity.

Monitoring Requirements

CWC Section 13267 authorizes the Regional Board to require monitoring and technical reports as necessary to investigate the impact of a waste discharge on waters of the state. In recent years there has been increased emphasis on obtaining all necessary information, assuring the information is timely as

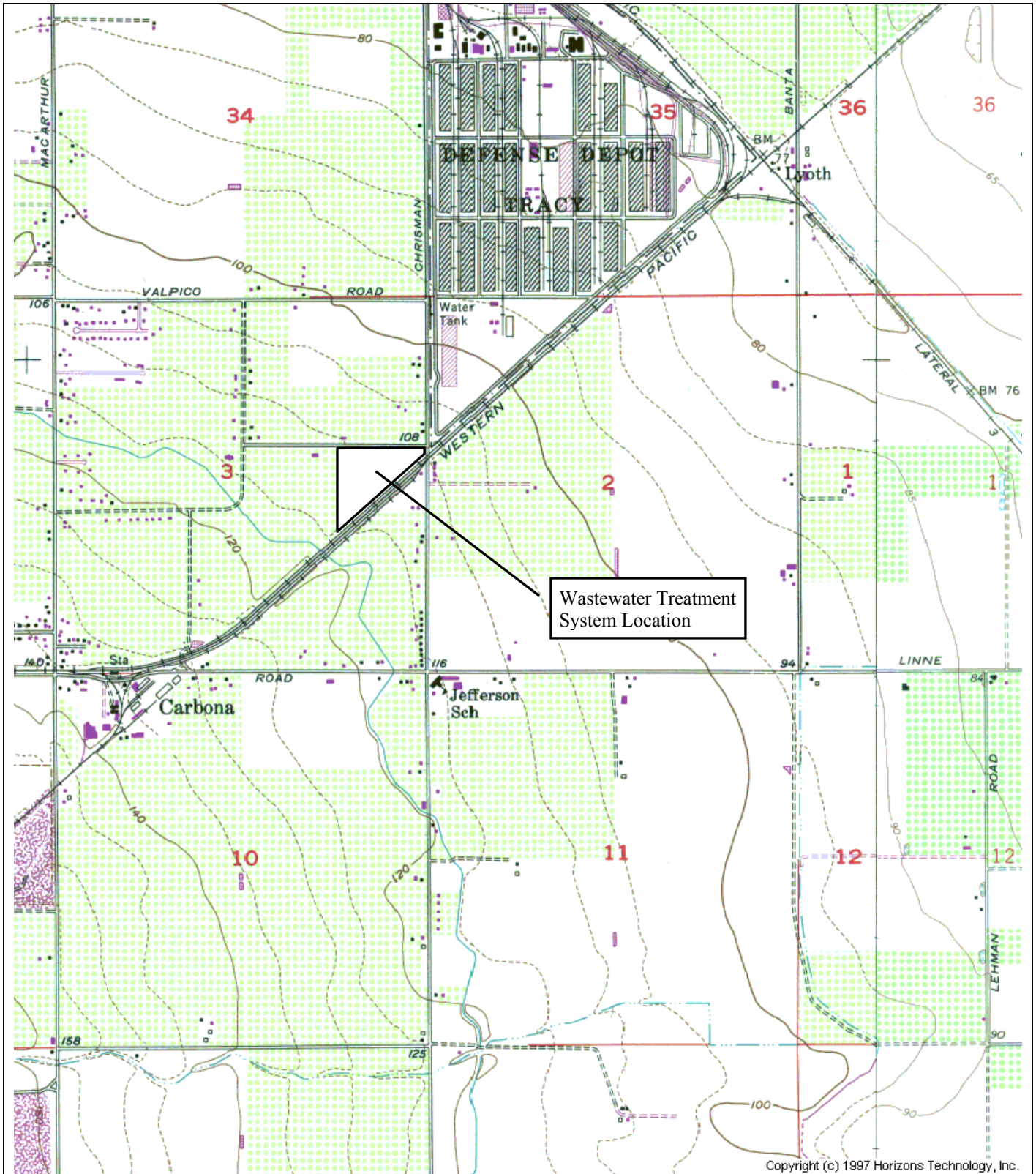
well as representative and accurate, thereby improving accountability of any discharger for meeting the conditions of discharge. CWC Section 13268 authorizes assessment of administrative civil liability where appropriate. The required reports are consistent with CWC Section 13267 because the Discharger is responsible for the discharge subject to the proposed Order and the reports are necessary to assure compliance with the proposed Order.

The Discharger is required to monitor the influent, effluent, dispersal area, and groundwater. To determine the effectiveness of the treatment system, the Discharger is required to monitor influent for flow and BOD, and effluent for BOD, coliform, TDS, pH, nitrogen compounds, and state the means of disinfection.

Title 27 regulations pertaining to groundwater monitoring and the detection and characterization of waste constituents in groundwater have been in effect and successfully implemented for many years. No regulation currently specifies similar criteria more suitable for a situation where extensive infiltration into groundwater occurs. However, where, as here, such infiltration occurs, it is appropriate that the Title 27 groundwater monitoring procedures be extended and applied on a case-by-case basis under Water Code Section 13267.

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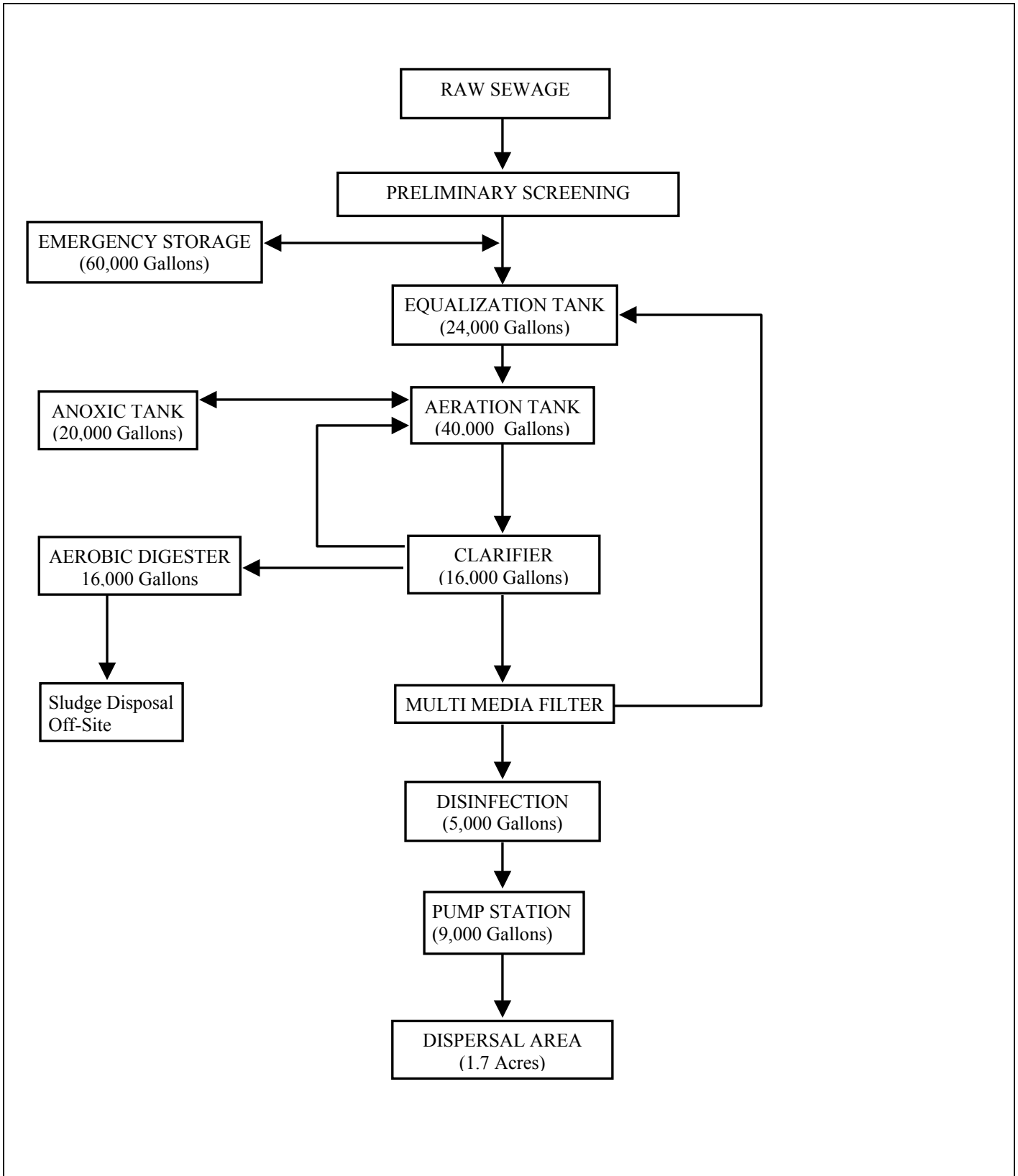
The conditions of discharge in the proposed Order were developed based on currently available technical information and applicable water quality laws, regulations, policies, and plans, and are intended to assure conformance with them. However, information is presently insufficient to develop final effluent and groundwater limitations, so the proposed Order contains interim limitations. Additional information must be developed and documented by the Discharger as required by schedules set forth in the proposed Order. The requirements that apply to this facility may be modified in the future based on new information.



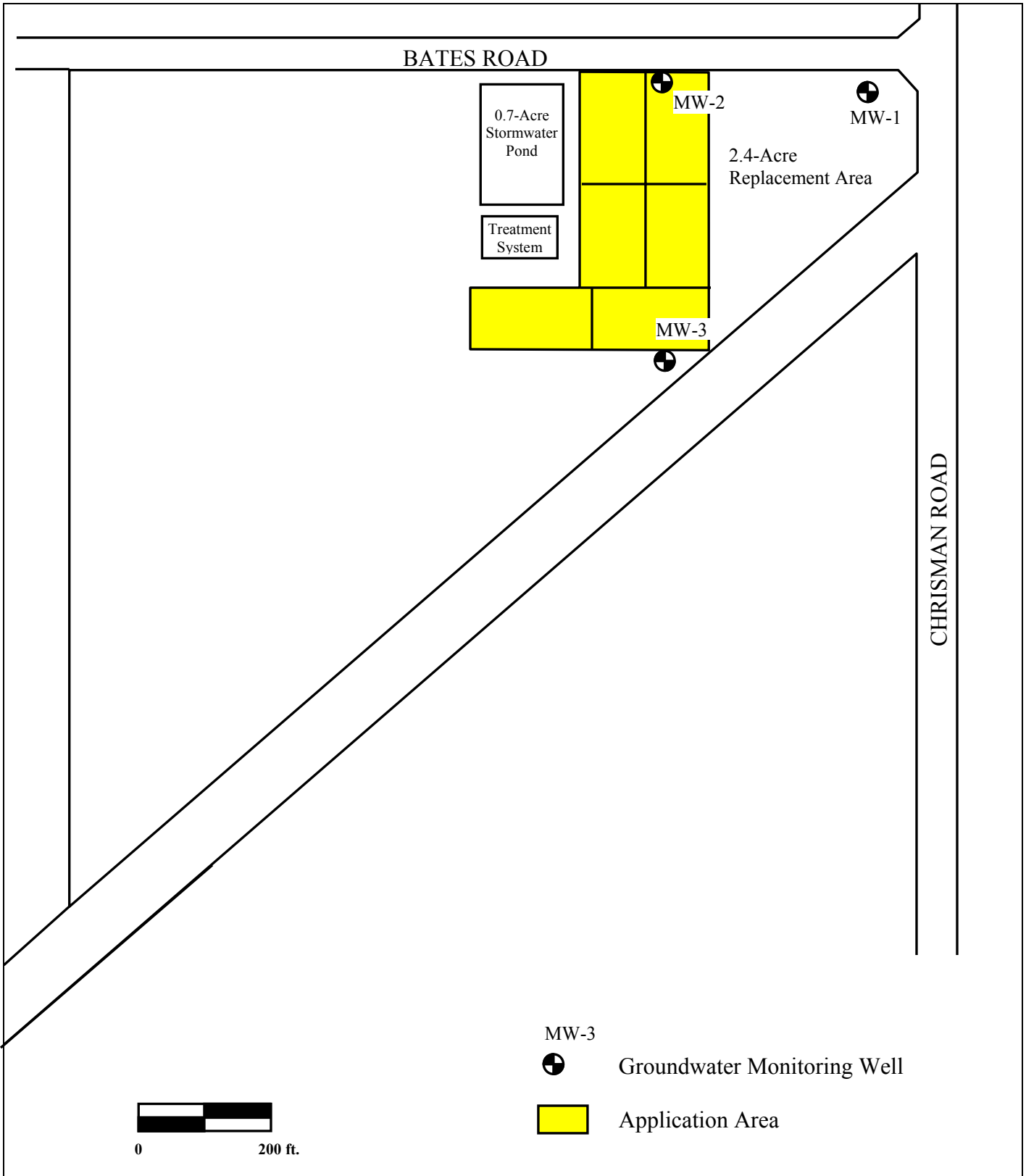
Drawing Reference:
 Tracy, California
 USGS TOPO MAP
 7.5 Minute Quad

SITE LOCATION MAP
 San Joaquin County Service Area
 Linne Estates
 7701 Nates Road, Tracy, San Joaquin County

approx. scale
 1 in. = 2,000 ft.

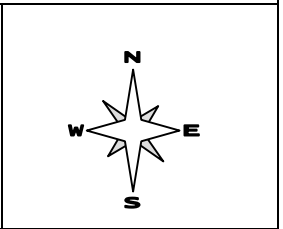


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|---|--|
| <p>Drawing Reference:</p> <p>Modified from Figure P.01 7H Tech Services, Inc. Report of Waste Discharge</p> | <p>SCHEMATIC FLOW DIAGRAM</p> <p>San Joaquin County Service Area Linne Estates 7701 Nates Road, Tracy, San Joaquin County</p> |
|---|--|



Drawing Reference:
Plate C.05 (modified)
Report of Waste
Discharge Addendum

WASTEWATER FACILITY MAP
San Joaquin County Service Area
Linne Estates
7701 Nates Road, Tracy, San Joaquin County





California Regional Water Quality Control Board

Central Valley Region



Terry Tamminen
Secretary for
Environmental
Protection

Robert Schneider, Chair

Arnold Schwarzenegger
Governor

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ORDER NO. R5-2004-0078

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 approve the workplan. Upon installation of the monitoring wells, the Discharger shall submit a well installation report which 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

California Environmental Protection Agency

- 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