CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. R5-2007-0125

WASTE DISCHARGE REQUIREMENTS

FOR
KIRKWOOD MEADOWS PUBLIC UTILITY DISTRICT
WASTEWATER TREATMENT PLANT
ALPINE AND AMADOR COUNTIES

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

1. Kirkwood Meadows Public Utility District (KMPUD), hereafter referred to as Discharger, submitted a Report of Waste Discharge (RWD) in March 2006 to update existing Waste Discharge Requirements (WDRs) for the KMPUD wastewater treatment plant. The WDRs are being updated because the Discharger has upgraded its existing wastewater treatment system and has installed a new disposal system. Supplemental information was received on 7 September 2006, 14 December 2006, and 8 June 2007.

2. For the purposes of this Order, the term "Wastewater Treatment Plant" (WWTP) shall mean the wastewater collection system, the wastewater treatment system, the sludge treatment and drying facilities, and the wastewater disposal system. The Discharger's RWD refers to the disposal system as absorption beds, or better know as leachfields. In the remainder of this order the absorption beds are referred to as leachfields.

3. The Discharger owns and operates the WWTP, which is located at 33540 Loop Road, Kirkwood, Alpine County. The treatment plant and disposal sites are located in Assessors Parcel No. 06-010-001 in Sections 27 and 28, T10N, R17E MDB&M, as shown on Attachment A and is attached hereto and made part of this Order by reference.

4. WDRs Order No. 94-108, adopted by the Regional Water Board on 22 April 1994, prescribes requirements for the KMPUD WWTP. This Order is neither adequate nor consistent with the current plans and policies of the Regional Board.

5. The WWTP treats and disposes of wastewater generated from residential and commercial units located in the community of Kirkwood Meadows, and the Kirkwood Ski Resort.

Wastewater Treatment and Disposal System

6. In the fall of 2005, the Discharger upgraded its WWTP from a conventional activated sludge treatment process to a membrane bioreactor (MBR) treatment process. The upgraded wastewater treatment provides tertiary treatment and disinfection. The treatment process includes influent screening, equalization storage, anoxic basins for denitrification, chemical additives for phosphorus removal, aeration basins, membrane basins, membrane filtration, disinfection with sodium hypochlorite, an effluent pump system, aerobic sludge storage, centrifuge sludge dewatering system, and an emergency storage tank. Because

of climatic conditions (i.e., significant winter snowfall) a majority of the wastewater treatment system is located inside of a building. A treatment system flowchart is presented in Attachment B, which is attached hereto and made part of this Order by reference. Each treatment component is further described below. The upgraded wastewater treatment system has a monthly average design capacity of 190,000 gallons per day (gpd) and a peak daily flow of 274,000 gpd. According to information provided in the Discharger's monthly self-monitoring reports for the year 2006, the monthly average influent flows range from approximately 21,300 to 92,650 gpd, with highest flows occurring during the late winter and early spring when snowmelt tends to occur.

7. Wastewater is delivered to the treatment system via two influent pump stations (East Lift Station and Main Lift Station). The East Lift Station has two 230 gallon per minute (gpm) submersible pumps that can be upsized to 400 gpm, while the Main Lift Station has two 90 gpm submersible pumps. Influent wastewater is screened using an automatic fine screen with 1/8-inch perforations that incorporates screening, washing, and compaction functions. The purpose of the screening is to remove larger solids and grit that could damage pumps or interfere with downstream process equipment. Screenings and grit are accumulated in a bagging unit and are picked up weekly for off-site disposal.

8. As part of the WWTP in upgrade in 2005, the Discharger installed a magnetic influent flow meter. However, the Discharger reported that the influent flow meter is not functioning correctly. The Discharger has been monitoring flows at the WWTP by monitoring effluent being discharged to the effluent disposal system. This Order requires the Discharger to monitor influent flows to the treatment plant and also requires the Discharger to fix or replace the influent flow meter so influent flows can be measured.

9. After screening, influent is routed into one of two equalization basins and/or an emergency storage basin (when needed) prior to being pumped into the treatment process. The main function of the equalization storage basins is to allow a portion of peak flows to be stored and then treated after flows subside. This allows the treatment process to be more reliable under peak flows. If Equalization Basin No. 1 becomes filled and there is need to store additional screened wastewater, then excess flow (influent flow minus flow to the MBR) is pumped from Equalization Basin No. 1 to Equalization Basin No. 2. If Equalization Basin No. 2 is filled and excess flows continue, Equalization Basin No. 2 overflows into Emergency Storage Basin No. 1. Equalization Basins Nos. 1 and 2, and the Emergency Storage Basin are closed (i.e., covered) hydraulic structures and are designed to provide one foot of freeboard. The equalization basins and storage basin sizes are as follows:

Basin	Storage Volume (gallons)
Equalization Basin No. 1	60,000
Equalization Basin No. 2	140,000
Emergency Storage Basin No. 1	65,000

10. Prior to wastewater being pumped from Equalization Basin No. 1 into the MBR treatment process, wastewater flows into four Anoxic Basins where it is denitrified. Each Anoxic Basin is concrete lined and has a storage capacity of approximately 12,850 gallons. "Alum"

(i.e., the coagulant aluminum sulfate) and caustics are then added to the wastewater to remove phosphorus.

11. After wastewater is denitrified and phosphorus removed, it is conveyed into the MBR treatment process, which includes two aeration basins, recirculation pumps, two membrane basins, and membrane filtration facilities.

12. Disinfection is performed by the addition of sodium hypochlorite to the MBR effluent. Duplex sodium hypochlorite feed units are used for redundancy. A 38,400-gallon chlorine contact basin is used to maximize contact time.

13. Besides emergency storage provisions, the WWTP incorporates many features that provide a high degree of reliability. All key mechanical equipment systems are provided with redundant standby units so that treatment can proceed at full capacity even when a piece of equipment fails. All pumping and aeration blowers have redundant units. The treatment system also includes multiple process basins so that treatment can continue if a basin is taken out of service for any reason. The KMPUD generates its own electrical power with onsite diesel generators. There are three normal power generators and one backup emergency generator. Only two of the four generators are needed to serve all key demands of the treatment facility at design capacity.

14. Disinfected wastewater is pumped via an effluent pump station to the effluent disposal system. The current effluent disposal system consists of approximately 3,040 linear feet of pressure-dosed leachline, which is divided among eight leachfields (leachfields 1 through 6, 10, and 10a) as shown on Attachment C and is attached hereto and made part of this Order by reference. The Discharger plans to abandon leachfields 5 and 6, and replace those with leachfields 7, 8 and 9 (installed in 2006), resulting in approximately 3,000 linear feet of disposal piping. The depth of the disposal trenches ranges from approximately four to six feet below ground surface. The Discharger's RWD indicates that effluent disposal system is designed to dispose of a monthly average flow of 190,000 gpd and a peak daily flow of 429,000 gallons.

15. In 1983, permeability testing of the soil in the area of current disposal system was conducted. Results of the testing indicate that the percolation rates ranged from approximately 2.2 to 11.4 inches per minute.

16. In March 2004, a hydrogeologic investigation of the effluent disposal system area was performed to determine whether the disposal system has enough hydraulic disposal capacity to accept a monthly average flow of 190,000 gpd. Results of the investigation indicate that the disposal system has sufficient disposal capacity, and that groundwater levels would rise to a maximum of two feet below the bottom of the disposal trenches.

17. Monitoring of wastewater depth in absorption bed disposal trenches can aid in estimating the condition of the effluent disposal system and in adjusting distribution of wastewater within the disposal system. Each individual absorption bed lateral has a monitoring port that terminates at the bottom of the gravel bed within the disposal trenches. The monitoring ports are equipped with a transducer that measures the water pressure in the

disposal trenches, and the data is transmitted back to a receiving unit at the WWTP. Water level measurement data is reviewed by WWTP staff on a daily basis to ensure that the wastewater disposal system is working correctly and overflows (due to hydraulic overloading) do not occur.

18. Waste sludge from the MBR treatment process is accumulated and partially digested in an aerated solids holding tank. Sludge from the holding tank is dewatered using a centrifuge. The dewatered sludge is disposed of at an off-site landfill by a commercial hauling service.

Chemical Constituents

19. Potable water for the community of Kirkwood Meadows and the Kirkwood Ski Resort is supplied by four groundwater supply wells. KMPUD provided potable water quality data for the year 2005, which is presented in the table below:

Constituent	Units	2005 Results			
		Well #2	Well #3	Well #4	Well #5
Chloride	mg/L	2.7	2.0	1.1	1.6
Sodium	mg/L	4.8	33.4	16	16
Nitrate (as NO3)	mg/L	0.54	<0.05	<0.05	<0.05
Nitrate (as N)	mg/L	<0.05	<0.05	<0.05	<0.05
TDS[1]	mg/L	89	178	157	157
Iron	ug/L	61	<50	<50	<50
Manganese	ug/L	<20	<30	50	50
Zinc	ug/L	.043	<0.05	<0.02	<0.02
EC[2]	umho/cm	91	250	201	197
Total Trihalomethanes	ug/L	ND	ND	ND	ND
Total Coliform Organisms	MPN	ND	ND	ND	ND

[1] Total Dissolved Solids
[2] Electrical Conductivity

20. As documented in the monthly monitoring reports, effluent wastewater quality for time period of January 2006 through January 2007 is characterized below. This data reflects the effluent from the upgraded MBR treatment process:

Constituent	Units	Monthly Average Effluent Concentration
BOD_5	mg/L	<1.0 to 3.6
Suspended Solids	mg/L	<1.0 to 2.0
Total Nitrogen (as N)	mg/L	10.5 to 19.8
Total Phosphorus	mg/L	0.2 to 10.4[1]
Total Dissolved Solids	mg/L	217 to 1620[1]
Total Coliform Organisms	MPN/100ml	< 2.0 to <425[1]
pH	Standard Units	6.8 to 8.3

[1] Elevated concentrations of total phosphorus, total dissolved solids, and total coliform organisms were due to a plant upset from maintenance on the MBR membranes in the month of November 2006. Excluding the high concentrations of total phosphorous, total dissolved solids, and total coliform in November 2006, the highest monthly average concentrations for total phosphorous, total dissolved solids, and total coliform were 3.8 mg/L, 458 mg/L, and <2.0 MPN/100ml, respectively.

21. The RWD provided the projected effluent concentrations for the WWTP, which are presented in the table below:

Approximate Seasonal Averages Based on Temperature and Snowmelt

Constituent	Warm Season (May through October)	Cold Season (November through April)
TKN	<2	<2
Ammonia (as N) mg/L	<1	<1
Nitrate (as N) mg/L	2 to 15	10 to 25
Total Nitrogen, mg/L	15	25
TDS, mg/L	200 to 800[a]	200 to 700[a]
PH	6.3 to 7.0	6.4 to 7.0

[a] When residential occupancy is very low (i.e., late spring), the salinity tends to be very low. When infiltration and inflow is very low (i.e., during the early fall), the salinity can be very high because of water conservation measures taken by the permanent residents due to the cost of water.

With the exception of TDS and pH, the projected effluent quality that the upgraded WWTP will provide is similar to that of what the WWTP effluent quality was during 2006. TDS effluent quality was generally lower than the projected 700 to 800 mg/l (maximum concentrations), while pH units were a little higher in effluent quality during 2006 compared to the projected pH effluent quality.

Wastewater Collection System

22. The Discharger owns and maintains approximately 8.3 miles of six-inch gravity sewer lines, and approximately 3,600 feet of eight-inch force main sewer lines. Within the KMPUD collection system there are two sewage pump stations. Both pump stations have alternate power capabilities in case of power outages. KMPUD owns a portable generator

that can provide alternate power if the emergency power system fails for any reason. Each pump station has alarms for high water levels and are connected to the WWTP SCADA system. When the WWTP is not manned, the alarm automatically notifies WWTP staff of potential problems at the pump stations.

23. KMPUD plans to conduct an assessment of the entire collection system in the summer of 2007 to identify areas of infiltration and inflow (I&I). Based on the results of the I&I assessment, KMPUD will determine which areas of the collection system need to be repaired. This Order requires the Discharger to submit the results of its I&I assessment, and provide a timeframe in which repairs will be made to the collection system. Because the KMPUD collection system is located in an environmentally sensitive area, and the water quality in the area are of pristine nature, this Order also requires the Discharger to prepare, submit, and implement a Sanitary Sewer System Operation, Maintenance, Overflow Prevention, and Response Plan.

24. The sanitary sewer system collects wastewater and consists of sewer pipes, manholes, and/or other conveyance system elements that direct raw sewage to the treatment facility. A "sanitary sewer overflow" is defined as a discharge to ground or surface water from the sanitary sewer system at any point upstream of the treatment facility. Temporary storage and conveyance facilities (such as wet wells, regulated impoundments, tanks, highlines, etc.) may be part of a sanitary sewer system and discharges to these facilities are not considered sanitary sewer overflows, provided that the waste is fully contained within these temporary storage/conveyance facilities. Sanitary sewer overflow is also defined in State Water Resources Control Board (State Water Board) Order No. 2006-0003-DWQ, *Statewide General Waste Discharge Requirements for Sanitary Sewer Systems*. A copy of State Water Board Order No. 2006-0003-DWQ is available at http://www.swrcb.ca.gov/resdec/wqorders/2006/wqo/wqo2006_0003.pdf

25. For the facility, any sanitary sewer overflows would consist of varying mixtures of domestic and commercial wastewater, depending on land uses in the sewage collection system. The chief causes of sanitary sewer overflows include grease blockages, root blockages, debris blockages, sewer line flood damage, manhole structure failures, vandalism, pump station mechanical failures, power outages, storm or groundwater inflow/infiltration, lack of capacity, and/or contractor caused blockages.

26. Sanitary sewer overflows often contain high levels of suspended solids, pathogenic organisms, toxic pollutants, nutrients, oxygen demanding organic compounds, oil and grease, and other pollutants. 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.

27. The Discharger is expected to take all necessary steps to adequately maintain, operate, and prevent discharges from its sanitary sewer collection system. This Order requires the Discharger to prepare and implement a *Sewer System Management Plan* (SSMP) consistent with State Water Board Order No. 2006-0003-DWQ.

Site-Specific Conditions

28. Average annual rainfall for the Kirkwood Meadows area is approximately 46.54 inches per year; the 100-year return annual total rainfall is 84.31 inches per year. This data is based on rainfall data collected from the weather station at Twin Lakes, Alpine County (Station No. A70 9105 00).

29. The wastewater disposal areas are outside of the 100-year floodplain.

30. Soils within effluent disposal areas consist of a mixture of silty sands, with various amounts of intermixed cobbles and gravel.

31. Natural ground slopes within the effluent disposal area are approximately 0.05 feet per foot.

32. The facility lies within the San Joaquin Delta Hydrologic Unit Area No. 514.36, as depicted on interagency hydrologic maps prepared by the Department of Water Resources in August 1986.

Groundwater Considerations

33. In 1999, Kleinfelder preformed a hydrogeologic investigation of the area where the existing leachfields are located. According to the information presented in the hydrogeologic investigation report, groundwater in the vicinity of the leachfields range from depths of 10 to 30 feet below ground surface. Groundwater flows northeast, with an estimated gradient of 0.1 feet per foot.

34. On 12 June 2006, and 17 November 2006, KMPUD sampled groundwater monitoring wells MW-2B and MW-5B in the vicinity of new proposed leachfields (leachfields 7, 8, and 9) to provide groundwater quality data for typical domestic wastewater constituents. The groundwater monitoring wells sampled are part of a petroleum groundwater cleanup project at the Kirkwood Maintenance Station. Leachfields 7, 8, and 9 are located near the maintenance station. Results of two sampling events are presented below:

		June 2006 Results	November 2006 Results	
Constituent/Parameter	Units	MW-5B	MW-2B	MW-5B
Depth to groundwater	Measurement	21.7	33.7	33.9
TDS	mg/L	134	97	122
Manganese	mg/L	0.079	3.3	1.0
Sodium	mg/L	6.9	12	8.7
Chloride	mg/L	10	6.8	11
Nitrate as N	mg/L	1.2	<0.05	0.14
TKN	mg/L	<1.0	<1.0	<1.0
pH	Standard units	5.9	6.2	6.0

Results of groundwater samples indicate that the groundwater in the vicinity of the leachfields appears to be of good quality, in general. Elevated manganese in MW-2B and MW-5B may have been caused by reducing conditions associated with the petroleum release.

35. In 2004, Kleinfelder performed groundwater modeling to determine what the groundwater levels would be at the effluent disposal areas during both critical (i.e., seasonal high groundwater and high I&I) and design flow conditions (190,000 gpd). Results indicate that groundwater levels from effluent disposal would rise anywhere between 9 and 12 feet beneath the disposal areas under maximum hydraulic loading conditions, but remain between two and seven feet below the disposal trenches. The modeling indicates that the effluent disposal system can function adequately under the design flow conditions.

36. There are no groundwater monitoring wells located upgradient or downgradient of the existing effluent disposal areas. Wells are necessary to determine the quality of background groundwater, and whether the existing effluent disposal activities have impacted the underlying groundwater. On 2 March 2007, staff requested that the Discharger install groundwater monitoring wells around the new and existing leachfields. The Discharger indicated that the groundwater monitoring wells will be installed by the early fall on 2007. This Order requires the Discharger to submit a well installation report certifying that the required monitoring wells have been installed.

Antidegradation Analysis

37. State Water Board Resolution No. 68-16 (hereafter Resolution 68-16 or the "Antidegradation Policy") requires the Regional Water Board in regulating the discharge of waste to maintain high quality waters of the state (i.e., background water quality) 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 Water Board's policies (e.g., quality that exceeds water quality objectives). Resolution 68-16 requires that any discharge that could degrade the waters of the state be regulated to assure use of best practicable treatment and control (BPTC) of the discharge to assure that pollution or nuisance will not occur, and the highest water quality consistent with maximum benefit to the people of the State will be maintained.

38. The RWD provided a preliminary antidegradation analysis for limited constituents. The analysis concluded that a thorough antidegradation analysis could not be performed since there was no groundwater quality data available for the wastewater disposal areas. The preliminary antidegradation analysis was based on the wastewater treatment and disposal process, effluent quality data from the WWTP, and limited (one round of groundwater sampling) groundwater quality data collected from the monitoring wells located at the Kirkwood Maintenance Facility. Based on this data, effluent disposal has the potential to degrade the underlying groundwater with respect to salinity, and potentially cause pollution of the underlying groundwater with respect to nitrogen compounds. This Order requires the Discharger to perform an interim antidegradation analysis, and a final antidegradation analysis once new groundwater wells have been installed and sampled for a minimum of eight quarters.

39. Concentrations of TDS in the potable water supplied to the KMPUD are approximately 160 mg/L. The monthly average TDS effluent concentration has been increasing over the last few years, with a value of 373 mg/l in 2002 and a value of 492 mg/l in 2006. The incremental addition of dissolved salts though water usage at this facility (about 332 mg/L) is higher than the normal range for domestic use, and may not be considered reasonable, especially if concentrations continue to rise. This Order contains an interim effluent limit of 495 mg/l TDS (that which the Discharger currently achieves), and requires the Discharger to complete a salinity BPTC analysis to determine additional best practicable treatment and control measures for salinity constituents, as well as an appropriate final effluent limit.

40. The WWTP has a nitrification/denitrification activated sludge process, which is considered BPTC for nitrogen compounds. Such a process can typically produce an effluent with total nitrogen concentrations of less that 10 mg/L, although the Discharger states that this particular system is only designed to remove total nitrogen to 15 mg/L from May through October and to 25 mg/L from November through April. KMPUD states that its wastewater is not typical because of cold temperatures, variable flows related to resort activities, variable waste strength due to I&I, and water conservation practices.

    For 2006, average monthly total nitrogen concentrations in effluent ranged from 8.9 to 18.0 mg/L, with a yearly average of 14.4 mg/L. In 2005, the yearly average total nitrogen concentration was 16.0 mg/L. Background groundwater concentrations appear to be approximately 1.0 mg/L for total nitrogen (see Finding No. 34). Based on these effluent concentrations and the apparent background groundwater quality, the current wastewater treatment process does not appear adequate to protect the underlying groundwater from pollution by nitrogen compounds. This Order contains interim nitrogen effluent limitations based on the Discharger's current treatment capability. This Order also requires the Discharger to submit a *Nitrogen BPTC Evaluation Report and Implementation Workplan* to determine additional best practicable treatment and control for nitrogen compounds, as well as the appropriate final effluent limit.

41. The Regional Water Board finds that some degradation of the groundwater beneath the WWTP is consistent with the maximum benefit to the people of the state provided that:

    a. The degradation is confined within a specified boundary;

    b. The Discharger minimizes the degradation by fully implementing, regularly maintaining, and optimally operating BPTC measures;

    c. The degradation is limited to waste constituents typically encountered in municipal wastewater as specified 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.

42. Some degradation of groundwater by some of the typical waste constituents released with discharge from a municipal wastewater utility after effective source control, treatment, and control is consistent with maximum benefit to the people of California. The technology, energy, water recycling, and waste management advantages of municipal utility service far exceed any benefits derived from a community otherwise reliant on numerous concentrated individual wastewater systems, and the impact on water quality will be

substantially less. Degradation of groundwater by constituents (e.g., toxic chemicals) other than those specified in the groundwater limitations in this Order, and by constituents that can be effectively removed by conventional treatment (e.g., total coliform bacteria) is prohibited. When allowed, the degree of degradation permitted depends upon many factors, such as background water quality, the waste constituent, the beneficial uses and most stringent water quality objective, source control measures, and waste constituent treatability.

43. This Order acknowledges that some degradation may occur as a result of the application of treated wastewater to land, but the Regional Board finds that such degradation at this facility is consistent with the maximum benefit to the people of the state. 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, provided that the terms of the Basin Plan are met. This Order is consistent with State Water Board policy.

Treatment and Control Practices

44. Resolution No. 68-16 requires the discharge to be regulated to assure use of best practicable treatment and control (BPTC). The Discharger will provide treatment and control of the discharge that incorporates:

a. Use of a low salinity, low hardness water supply;
b. Use of “Alum” in the wastewater treatment process to reduce effluent phosphorous concentrations;
c. Use of nitrification/denitrification treatment process to reduce organic and inorganic nitrogen content in effluent;
d. Alarm and automatic flow diversion systems to prevent system bypass or overflow;
e. Use of membrane treatment technology to minimize particulate emissions to the effluent disposal system;
f. Wastewater treated to tertiary treatment level;
g. Disposal of effluent via subsurface leachfields, to allow additional treatment and minimize evapoconcentration of salts.
h. Appropriate biosolids storage and disposal practices;
i. An Operation and Maintenance (O&M) manual; and
j. Certified operators to assure proper operation and maintenance.

45. The WWTP design incorporates numerous BPTC measures. However, in order to determine compliance with Resolution No. 68-16, it is appropriate to require that the Discharger establish a schedule for installation and sampling of additional groundwater monitoring wells, formally determine background groundwater concentrations for selected constituents, and determine additional BPTC measures to reduce nitrogen and salinity in the effluent. If groundwater is degraded or there is evidence that the discharge may cause degradation, then the Discharger will be required to evaluate and implement additional BPTC measures for each conveyance, treatment, storage, and disposal component of the

system. Completion of these tasks will ensure that BPTC and the highest water quality consistent with the maximum benefit to the people of the state will be achieved.

46. This Order establishes interim groundwater limitations for the WWTP that will not unreasonably threaten present and anticipated beneficial uses or result in groundwater quality that exceeds water quality objectives set forth in the Basin Plan. This Order also 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 and the Basin Plan. Based on the results of the scheduled tasks, the Regional Water Board may reopen this Order to reconsider groundwater limitations and other requirements to comply with Resolution 68-16.

Basin Plan, Beneficial Uses, and Regulatory Considerations

47. 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. These requirements implement the Basin Plan.

48. Surface water drainage in the vicinity of the effluent disposal area flows to Kirkwood Creek, which is a tributary to Caples Creek. Caples Creek flows into the Silver Fork of the American River, which flows into the South Fork of the American River. The beneficial uses of the South Fork of the American River above Placerville are municipal and domestic supply; hydropower generation; water contact recreation; non-contact water recreation; warm freshwater habitat; cold freshwater habitat; spawning, reproduction, and/or early development of aquatic life; and wildlife habitat.

49. The Basin Plan designates the beneficial uses of underlying groundwater as municipal and domestic supply, agricultural supply, industrial service supply, and industrial process supply.

50. The Basin Plan establishes numerical and narrative water quality objectives for surface water and groundwater within the basin. Numerical and narrative water quality objectives are maximum (i.e., least stringent) limits directly applicable to the protection of designated beneficial uses of the water. Controllable water quality factors are not allowed to cause further degradation of water quality in instances where other factors have already resulted in water quality objectives being exceeded. Controllable factors are those actions, conditions, or circumstances resulting from human activities that may influence the quality of the waters of the State, are subject to the authority of the State or Regional Board, and that may be reasonably controlled. In addition, the water quality objectives do not require improvement over naturally occurring background concentrations. As described in the attached Information Sheet, the Basin Plan requires that the Regional Water 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.

51. 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 (CCR): 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 Water Board may apply limits more stringent than MCLs to ensure that waters do not contain chemical constituents in concentrations that adversely affect beneficial uses.

52. State Board Order No.WQO-2003-0014 upheld the Regional Board's use of numeric groundwater limits, and states that numeric groundwater limits must be restricted to those constituents present in the waste, breakdown products of constituents present in the waste, and those that might be leached from the soil beneath the wastewater disposal area. The Groundwater Limitations of this Order complies with State Board Order No.WQO-2003-0014, as described below. Additional information regarding each of these chemicals is found in the Information Sheet.

    a. The Discharger has not yet sampled its effluent for boron. However, boron occurs naturally in waters, and is known to be present in the cleaning products used in domestic households[1]. Boron has been found in the wastewater effluent at other domestic wastewater treatment facilities at concentrations ranging from 0.7 to 2.2 mg/l, and is expected to be present in the wastewater at this facility. Boron has the potential to degrade groundwater quality because there is little ability for attenuation in the shallow permeable vadose zone beneath this facility. The groundwater underlying the facility is of pristine quality and has the designated beneficial use of agricultural supply. According to Ayers and Westcot[2], boron can damage sensitive crops if present in excess of 0.7 mg/L in irrigation water, thereby impairing agricultural use of the water resource. The applicable water quality objective to protect the agricultural use from discharges of boron is the narrative Chemical Constituents objective, which is implemented following the "Policy of Application of Water Quality Objectives" in the Basin Plan. A numerical groundwater limitation of 0.7 mg/L for boron, based on Ayers and Westcot, is appropriate to apply the narrative Chemical Constituents objective to protect the agricultural use of groundwater. This limit assumes no impact on sensitive agricultural uses, consistent with the high quality of expected natural background water quality in the area of the discharge.

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[1] American Public Health Association et al., 1985.Standard Method for the Examination of Water and Wastewater, 16th Edition.

[2] 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). This paper contains the results of studies of the impacts of various chemicals on agricultural uses including crop irrigation and stock watering. Therefore, it is appropriate to use the data contained therein to apply the narrative Chemical Constituent water quality objective.

b. The Discharger has not yet sampled its effluent for chloride. However, chloride is known to be present in wastewater, as it is one of the major components of total dissolved solids. Chloride is a major anion in natural water and wastewater, and is added to the waste stream because chloride is present in the human diet and is excreted unchanged from the human body[1,3]. Chloride concentrations at other facilities vary depending on the salinity of the source water and the activities resulting in wastewater discharge. At other domestic wastewater facilities, chloride has been present in the wastewater at concentrations ranging from 48 to 310 mg/l, and is expected to be present at this facility. Chloride has the potential to degrade groundwater quality because there is little ability for attenuation in the shallow permeable vadose zone beneath this facility. According to Ayers and Westcot[2], chloride can damage sensitive crops if present in excess of 106 mg/L in irrigation water applied by sprinklers, thereby impairing agricultural use of the water resource. The applicable water quality objective to protect the agricultural use from discharges of chloride is the narrative Chemical Constituents objective, which is implemented following the "Policy of Application of Water Quality Objectives" in the Basin Plan. A numerical groundwater limitation of 106 mg/L for chloride, based on Ayers and Westcot, is appropriate to apply the narrative Chemical Constituents objective to protect the agricultural use of groundwater. This limit assumes no impact on sensitive agricultural uses, consistent with the high quality of expected natural background water quality in the area of the discharge.

c. The Discharger has not yet sampled its effluent for iron. Iron is naturally occurring in all waters due to its presence in soils and rocks[1], and is liberated from the soil under oxidizing conditions associated with the biodegradation of organic matter. Iron is known to be present in domestic wastewater, and at other domestic wastewater facilities has been found at concentrations ranging from 70 to 190 ug/L. It is also expected to be present in the effluent from this facility. Iron has the potential to degrade groundwater quality because there is little ability for attenuation in the shallow permeable vadose zone beneath this facility. In addition, naturally occurring iron can be solubilized from soil under reducing conditions caused by the land disposal of domestic wastewater[1]. The Chemical Constituents objective prohibits concentrations of chemical constituents in excess of California MCLs in groundwater that is designated as municipal or domestic supply. The California secondary MCL for iron is 0.3 mg/L, and groundwater beneath the facility is designated as municipal or domestic supply. It is therefore appropriate to adopt a numerical groundwater limitation of 0.3 mg/L for iron to implement the Chemical Constituents objective to protect the municipal and domestic use of groundwater.

d. The Discharger has not yet sampled its effluent for manganese. Manganese occurs naturally in waters and is added to the waste stream through both domestic and industrial use[1]. Manganese has been found at other facilities at concentrations ranging from 2 to 21 ug/L, and is expected to be present at this facility. Manganese has the potential to degrade groundwater quality because there is little ability for attenuation in the shallow permeable vadose zone beneath this facility. In addition,

[3] Metcalf and Eddy, 2003. Wastewater Engineering Treatment and Reuse, 4th Edition.

naturally occurring manganese can be solubilized from soil under reducing conditions caused by the land disposal of domestic wastewater, and is more prevalent in dissolved forms in groundwater[1]. The Chemical Constituents objective prohibits concentrations of chemical constituents in excess of California MCLs in groundwater that is designated as municipal or domestic supply. The California secondary MCL for manganese is 50 µg/L, and groundwater beneath the facility is designated as municipal or domestic supply. It is therefore appropriate to adopt a numerical groundwater limitation of 50 µg/L for manganese to implement the Chemical Constituents objective to protect the municipal and domestic use of groundwater.

e. The Discharger has not yet sampled its effluent for sodium. However, sodium is known to be present in wastewater, as it is one of the major components of total dissolved solids. Sodium is a major cation in natural water, due to its prevalence in the earth's crust, and in wastewater because sodium chloride is present in the human diet and is excreted unchanged by the body[1]. Sodium concentrations at other facilities vary depending on the salinity of the source water and the activities resulting in wastewater discharge. At other domestic wastewater facilities, sodium has been present in the wastewater at concentrations ranging from 89 to 300 mg/l, and it is also expected to be found in the effluent at this facility. Sodium has the potential to degrade groundwater quality because there is little ability for attenuation in the shallow permeable vadose zone beneath this facility. According to Ayers and Westcot[2], sodium can damage sensitive crops if present in excess of 69 mg/L in irrigation water, thereby impairing agricultural use of the water resource. The applicable water quality objective to protect the agricultural use from discharges of sodium is the narrative Chemical Constituents objective, which is implemented following the "Policy of Application of Water Quality Objectives" in the Basin Plan. A numerical groundwater limitation of 69 mg/L for sodium, based on Ayers and Westcot, is appropriate to apply the narrative Chemical Constituents objective to protect the agricultural use of groundwater. This limit assumes no impact on sensitive agricultural uses, consistent with the high quality of expected natural background water quality in the area of the discharge.

f. Total dissolved solids, which were found to be present in the wastewater at concentrations up to 492 mg/L (and are projected by the Discharger to increase to 800 mg/L), have the potential to degrade groundwater quality because there is little ability for attenuation in the shallow permeable vadose zone beneath this facility. According to Ayers and Westcot[2], dissolved solids can damage sensitive crops if present in excess of 450 mg/L in irrigation water, thereby impairing agricultural use of the water resource. The applicable water quality objective to protect the agricultural use from discharges of total dissolved solids is the narrative Chemical Constituents objective, which is implemented following the "Policy of Application of Water Quality Objectives" in the Basin Plan. A numerical groundwater limitation of 450 mg/L for total dissolved solids, based on Ayers and Westcot, is appropriate to apply the narrative Chemical Constituents objective to protect the agricultural use of groundwater. This limit assumes no impact on sensitive agricultural uses, consistent with the high quality of expected natural background water quality in the area of the discharge.

g. Nitrate, which was found to be present in the wastewater at concentrations up to 20 mg/L as nitrogen (and is projected by the Discharger to be present at up to 25 mg/L as nitrogen), has the potential to degrade groundwater quality because there is little ability for attenuation in the shallow permeable vadose zone beneath this facility. The Chemical Constituents objective prohibits concentrations of chemical constituents in excess of California MCLs in groundwater that is designated as municipal or domestic supply. The California primary MCL for nitrate is equivalent to 10 mg/L as nitrogen, and groundwater beneath the facility is designated as municipal or domestic supply. It is therefore appropriate to adopt a numerical groundwater limitation of 10 mg/L for nitrate as nitrogen to implement the Chemical Constituents objective to protect the municipal and domestic use of groundwater.

h. The Discharger anticipates that ammonia will be present in the wastewater at <1 mg/L. Ammonia has the potential to degrade groundwater quality because there is little ability for attenuation in the shallow permeable vadose zone beneath this facility. According to Amoore and Hautala[4], the odor of ammonia can be detected in water at a concentration of 1.5 mg/L (as ammonia), and concentrations that exceed this value can impair the municipal or domestic use of the resource due to the adverse odor. The applicable water quality objective to protect the municipal and domestic use from discharges of ammonia is the narrative Tastes and Odors objective, which is implemented following the "Policy of Application of Water Quality Objectives" in the Basin Plan. A numerical groundwater limitation of 1.5 mg/L for ammonia (as ammonia), based on Amoore and Hautala, is appropriate to apply the narrative Tastes and Odors objective to protect the municipal and domestic use of groundwater.

i. pH, which ranged 6.8 to 8.3 standard units in the wastewater, has the ability to degrade groundwater quality because there is little potential for buffering in the shallow permeable vadose zone beneath this facility. According to Ayers and Westcot[2], pH less than 6.5 or greater than 8.4 can damage sensitive crops if present in irrigation water, thereby impairing agricultural use of the water resource. The applicable water quality objective to protect the agricultural use from discharges of substances that affect pH is the narrative Chemical Constituents objective, which is implemented following the "Policy of Application of Water Quality Objectives" in the Basin Plan. A numerical groundwater limitation range of 6.5 to 8.4 for pH, based on Ayers and Westcot, is appropriate to apply the narrative Chemical Constituents objective to protect the agricultural use of groundwater. This limit assumes no impact on sensitive agricultural uses, consistent with the high quality of expected natural background water quality in the area of the discharge.

j. The trihalomethane chemicals bromoform, bromodichloromethane, chloroform, and dibromochloromethane are found in wastewater that has been chlorinated. These

[4] Amoore, J.E. 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). These authors studied the concentration of chemicals in air which caused adverse odors and then calculated the concentration in water that would be equivalent to that amount in air. Therefore, it is appropriate to use the data contained therein to apply the narrative Tastes and Odors water quality objective.

byproducts are formed from reactions with organic matter during the disinfection process. Although the Discharger has not yet sampled its effluent for trihaolmethanes, it is reasonable to assume that they will be present. These volatile organic chemicals do not naturally occur in groundwater, and are toxic priority pollutants. Local groundwater is designated as municipal and domestic supply and is used as a source of drinking water by the KMPUD. According to the USEPA and the Cal/EPA Office of Environmental Health Hazard Assessment, these four chemicals pose a cancer risk at low concentrations in drinking water, and could thereby impair the municipal and domestic beneficial use by imposing toxicity. The applicable water quality objective to protect the municipal and domestic beneficial use from discharges of these trihaolmethanes is the narrative Toxicity objective, which is implemented following the "Policy of Application of Water Quality Objectives" in the Basin Plan. For bromoform, a numerical groundwater limitation of 4 ug/L, based on the USEPA IRIS[5] cancer risk level, is appropriate to apply the narrative Toxicity objective to protect the municipal and domestic beneficial use of groundwater. For bromodichloromethane, a numerical groundwater limitation of 0.27 ug/L, based on the Cal/EPA Cancer Potency Factor[6], is appropriate to apply the narrative Toxicity objective to protect the municipal and domestic beneficial use of groundwater. For chloroform, a numerical groundwater limitation of 1.1 ug/L, based on the Cal/EPA Cancer Potency Factor, is appropriate to apply the narrative Toxicity objective to protect the municipal and domestic beneficial use of groundwater. For dibromochloromethane, a numerical groundwater limitation of 0.37 ug/L, based on the Cal/EPA Cancer Potency Factor, is appropriate to apply the narrative Toxicity objective to protect the municipal and domestic beneficial use of groundwater.

53. 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 numerical receiving water limitations will be established in Board orders which will, at a minimum, meet all applicable water quality objectives, that where compliance with narrative objectives is required (i.e., where the objectives are applicable to protect specified beneficial uses), the Regional Water Board will, on a case-by-case basis, adopt numerical limitations in orders which will implement the narrative objectives, and that compliance with narrative water quality objectives may be evaluated considering numerical criteria and guidelines developed and/or published by other agencies and organizations.

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5 U.S. Environmental Protection Agency, Integrated Risk Information System, http://www.epa.gov/iris.

6 California Environmental Protection Agency, Office of Environmental Health Hazard Assessment, California Environmental Protection Agency Toxicity Criteria Database, http://www.oehha.org/risk/ChemicalDB/index.asp.

54. The "Antidegradation" section of the attached Information Sheet lists the various waste constituents identified thus far as fitting the restriction of the Findings, along with limits of each constituent necessary to protect beneficial uses known to be adversely affected by waste constituents in groundwater. The listing identifies each constituent, the beneficial uses, water quality objective, and its associated limit, as well as the technical reference for the limit. Some limits may become less restrictive when the water supply is limited to certain applications of a beneficial use. However, in the absence of specific factual information supplied by the discharger to justify restricting certain beneficial uses, groundwater limits have been selected so as to provide protection of unrestricted beneficial uses. Interim groundwater limitations for each constituent reflect the most restrictive listed limit for the waste constituent, except if natural background quality is greater, in which case background becomes the interim limitation.

Other Regulatory Considerations

55. On 2 May 2006, the State Water Resources Control Board adopted *Statewide General Waste Discharge Requirements For Sanitary Sewer Systems General Order No. 2006-0003-DWQ* (General Order). The General Order requires all public agencies that own or operate sanitary sewer systems greater than one mile in length to comply with the Order. The Discharger's collection system exceeds one mile in length, and therefore the General Order is applicable. In July 2006, the Discharger submitted a Notice of Intent to the State Water Board for coverage under General Order 2006-0003-DWQ.

56. The United States Environmental Protection Agency (EPA) has promulgated biosolids reuse regulations in 40 CFR 503, *Standard for the Use or Disposal of Sewage Sludge,* which establishes management criteria for protection of ground and surface waters, sets application rates for heavy metals, and establishes stabilization and disinfection criteria.

57. The Regional Water Board is using the Standards in 40 CFR 503 as guidelines in establishing this Order, but the Regional Water Board is not the implementing agency for 40 CFR 503 regulations. The Discharger may have separate and/or additional compliance, reporting, and permitting responsibilities to the EPA. The RWD states that all biosolids will be hauled to a separate permitted facility.

58. The State Board adopted Order No. 97-03 DWQ (General Permit No. CAS000001) specifying waste discharge requirements for discharges of storm water associated with industrial activities, and requiring submittal of a Notice of Intent by all affected industrial dischargers. Industrial Storm Water permitting requirements do not apply to this facility since the WWTP treats and disposes of less than 1.0 million gallons per day. Therefore, the Discharger is not required to apply for a stormwater NPDES permit.

59. An Environmental Impact Report (EIR) was prepared for the Kirkwood Specific Plan, the Mountain Master Plan, and the Wastewater Treatment Plant Upgrade project. On 8 May 2003, KMPUD adopted the Final EIR for the project in accordance with the California Environmental Quality Act (CCR, Title 14, Section 15261 et. seq.).

60. 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 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. R5-2007-0125 are necessary to assure compliance with these waste discharge requirements. The Discharger owns and operates the facility that discharges the waste subject to this Order.

61. The California Department of Water Resources sets standards for the construction and destruction of groundwater wells (hereafter DWR Well Standards), 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 used to monitor the impacts of wastewater disposal governed by this Order.

62. 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 20380. While the WWTP 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.

63. 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, CCR, Section 20380 et seq. The exemption, pursuant to Title 27 CCR 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 associated with a municipal wastewater treatment plant.

64. 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

65. All the above and the supplemental information and details in the attached Information Sheet, which is incorporated by reference herein, as well as the Regional Water Board's

administrative record, were considered in establishing the following conditions of discharge.

66. The Discharger and interested agencies and persons have been notified of the Regional Water Board's intent to prescribe waste discharge requirements for this discharge, and they have been provided an opportunity to submit written comments and an opportunity for a public hearing.

67. All comments pertaining to the discharge were heard and considered in a public hearing.

IT IS HEREBY ORDERED that Order No. 94-108 is rescinded, and that pursuant to Sections 13263 and 13267 of the California Water Code, Kirkwood Meadows Public Utility District, 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. Discharge of sewage from the sanitary sewer system at any point upstream of the wastewater treatment plant is prohibited. Discharge of treated wastewater outside of the effluent disposal area (i.e., leachfields) is prohibited.

4. Discharge of waste classified as "hazardous" under Title 23 CCR Chapter 15, Section 2521, or "designated," as defined in Section 13173 of CWC is prohibited.

5. Surfacing of waste within or downgradient of the effluent disposal area is prohibited.

B. Discharge Specifications

1. The monthly average influent flow shall not exceed 190,000 gpd, or a peak daily flow of 274,000 gallons.

2. Wastewater within the wastewater disposal trenches shall be maintained within one foot or more below ground surface.

3. Wastewater treatment and disposal shall not cause pollution or a nuisance as defined by Section 13050 of the CWC.

4. Public contact with wastewater in the effluent disposal areas shall be precluded or controlled through such means as fences, signs, or acceptable alternatives.

5. 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.

6. Objectionable odors originating at this facility shall not be perceivable beyond the limits of the wastewater treatment and disposal systems.

7. The Discharger shall operate all systems and equipment to maximize treatment of wastewater and optimize the quality of the discharge. The wastewater shall be filtered at all times.

8. The freeboard in the emergency storage basin shall never be less than one foot as measured vertically from the water surface to the lowest point of overflow.

9. All treatment and disposal facilities shall be designed, constructed, operated, and maintained to prevent inundation or washout due to floods with a 100-year return frequency.

10. The wastewater treatment and disposal system shall have sufficient treatment and disposal capacity to accommodate allowable wastewater flow, design seasonal precipitation, and ancillary inflow and infiltration. Design seasonal precipitation shall be based on total annual precipitation using a return period of 100 years, distributed monthly in accordance with historical precipitation patterns.

11. Disposal of wastewater shall be confined to each wastewater disposal area as defined in Finding No.14 of this Order.

12. A 100-foot buffer zone shall be maintained between the nearest point of the wastewater disposal system and any year-round flowing creek, spring, domestic well, or irrigation well.

13. A 50-foot buffer zone shall be maintained between the nearest point of the wastewater disposal system and any seasonal drainage course.

C. Effluent Limitations

1. Effluent discharged from the wastewater treatment plant into the wastewater disposal system shall not exceed the following limits or interim limits, or lower values as necessary to comply with the Groundwater Limitations:

Constituent	Units	Monthly Average	Daily Maximum	Yearly Average
BOD_5[1]	mg/L	10	20	
Total N as N (Interim Limit)	mg/L	20	--	15
TDS (Interim limit)	mg/L	495	--	

Constituent	Units	Monthly Average	Daily Maximum	Yearly Average
Total Phosphorous	mg/L	5		
Total Coliform Organisms	MPN/100ml	<2.0	23	

[1] BOD_5 denotes 5-day Biochemical Oxygen Demand.

2. Wastewater discharged to the wastewater disposal areas shall not have a pH less than 6.5 or greater than 8.4.

D. 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. Biosolids refers to sludge that has undergone sufficient treatment and testing to qualify for reuse pursuant to federal and state regulations as a soil amendment for agriculture, silviculture, horticulture, and land recycling.

1. Sludge and solid waste shall be removed from screens, sumps, basins, and clarifiers as needed to ensure optimal plant operation.

2. Any storage or treatment of residual sludge, solid waste, and biosolids at the facility shall be temporary and confined to the treatment facility property. 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.

3. Residual sludge, biosolids, and solid waste shall be disposed of in a manner approved by the Executive Officer and consistent with Title 27 CCR Division 2. 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.

4. Use and disposal of biosolids shall comply with the self-implementing Federal regulations of 40 CFR 503, which are subject to enforcement by the U.S. EPA, not the Regional Water Board. If during the life of this Order, the state accepts primacy for implementation of 40 CFR 503, the Regional Water Board may also initiate enforcement where appropriate.

E. Interim Groundwater Limitations

1. Release of waste constituents from the WWTP, including the wastewater disposal area shall not cause groundwater to:

   a. Contain any of the following constituents in concentrations greater than listed or greater than natural background quality, whichever is greater. Note that natural

background conditions have not yet been established for the wastewater disposal areas.

Constituent	Units	Limitation
Boron	mg/L	0.7
Chloride	mg/L	106
Iron	mg/L	0.3
Manganese	mg/L	0.05
Sodium	mg/L	69
Total Coliform Organisms	MPN/100 mL	<2.2
Total Dissolved Solids	mg/L	450
Total Nitrogen	mg/L	10
Nitrate (as N)	mg/L	10
Ammonia (as NH_4)	mg/L	1.5
Bromoform	μg/L	4
Bromodichloromethane	μg/L	0.27
Chloroform	μg/L	1.1
Dibromochloromethane	μg/L	0.37

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.

F. Provisions

1. All of the following reports shall be submitted pursuant to Section 13267 of the California Water Code and shall be prepared as described in Provision F.3.

   a. By **31 October 2007**, the Discharger shall submit and immediately implement an Inflow and Infiltration (I/I) Assessment Report that describes the results ofd the Discharger's I/I evaluation of the collection system, and describes the repairs that must be completed to reduce I/I to industry standards. The report shall also include a proposed schedule for necessary repairs and/or replacement of the collection system components contributing to the I/I problems.

   b. By **15 November 2007**, the Discharger shall submit and implement a report certifying that it has either fixed the existing influent flow meter, or installed a new flow meter, and that the meter was calibrated to accurately monitor influent flows into the treatment plant.

   c. By **30 November 2007**, the Discharger shall submit a Monitoring Well Installation Report prepared in accordance with, and including the items listed in, the second section of Attachment D: *"Monitoring Well Workplan and Monitoring Well Installation Report Guidance."* The report shall describe the installation and development of the new monitoring wells and explain any deviation from the approved workplan.

d. By **15 January 2008**, the Discharger shall submit a *Sanitary Sewer System Operation, Maintenance, Overflow Prevention, and Response Plan* (SSSOP) for the entire KMPUD WWTP collection system. The SSSOP shall describe the actions designed to prevent, or minimize the potential for sanitary sewer overflows, and include the information required in Sections 4 and 6 of State Water Board Order No. 2006-0003-DWQ . The Discharger shall maintain the SSSOP in an up-to-date condition and shall amend the SSSOP whenever there is a change (e.g. in the design, construction, operation, or maintenance of the sanitary sewer system or sewer facilities) that materially affects the potential for sanitary sewer overflows, or whenever there is a sanitary sewer overflow. The Discharger shall ensure that the up-to-date SSSOP is readily available to sewer system personnel at all times and that sewer system personnel are familiar with it.

e. By **1 April 2008**, the Discharger shall prepare and implement a *Salinity Evaluation and Minimization Plan* to address sources of salinity to the wastewater treatment system. At a minimum, the plan shall meet the following requirements outlined in CWC Section 13263.3(d)(3) Pollution Prevention Plans:

i. An estimate of all of the sources of a pollutant contributing, or potentially contributing, to the loadings of salinity in the treatment plant influent including water supply, water softeners, and other residential, commercial and industrial salinity sources.

ii. An analysis of the methods that could be used to prevent the discharge of salinity into the facility, including application of local limits to industrial or commercial dischargers regarding pollution prevention techniques, public education and outreach, or other innovative and alternative approaches to reduce discharges of the pollutant to the facility. The analysis shall also identify sources, or potential sources, not within the ability or authority of the Discharger to control.

iii. An estimate of load reductions that may be identified through the methods identified in subparagraph ii.

iv. A plan for monitoring the results of the salinity pollution prevention program.

v. A description of the tasks, costs, and time required to investigate and implement various elements in the salinity pollution prevention plan.

vi. A statement of the Discharger's salinity pollution prevention goals and strategies, including priorities for short-term and long term action, and a description of the Dischargers intended pollution prevention activities for the immediate future.

vii. A description of the Discharger's existing salinity pollution prevention programs.

viii. An analysis, to the extent feasible, of any adverse environmental impacts, including cross-media impacts or substitute chemicals that may result from the implementation of the pollution prevention program.

ix. An analysis, to the extent feasible, of the costs and benefits that may be incurred to implement the pollution prevention program.

x. Progress to date in reducing the concentration and/or mass of salinity in the discharge.

f. By **31 December 2008**, the Discharger shall submit an Interim *Nitrogen and Salinity BPTC Evaluation.* The report shall contain the interim results of the *Salinity Evaluation.* The report shall also contain an interim evaluation of BPTC measures to reduce nitrogen compounds in effluent, a discussion of BPTC measures proposed for implementation (i.e., recommendations for WWTP modifications), estimated concentration or mass loading reductions for each BPTC measure, and specific methods the Discharger proposes to monitor and assure continuous optimal performance of BPTC measures.

g. By **31 December 2009**, the Discharger shall submit a Final *Nitrogen and Salinity BPTC Evaluation Report and Implementation Workplan*. The report shall include a comprehensive evaluation of the BPTC measures studied to reduce nitrogen and salinity compounds in effluent, a discussion of BPTC measures proposed for implementation (i.e., recommendations for WWTP modifications), estimated concentration or mass loading reductions for each BPTC measure, specific methods the Discharger proposes to monitor and assure continuous optimal performance of BPTC measures, and proposed schedule for modifications. The schedule for full implementation shall be as short as practicable, and in no case shall it exceed two years past the Executive Officer's approval of the workplan unless specifically approved by the Regional Water Board. The component evaluation, recommended improvements, and implementation schedule are subject to the Executive Officer's approval. The report shall also describe how final effluent limits (which minimize degradation of the groundwater to the maximum extent practicable) shall be determined.

h. By **31 December 2009**, the Discharger 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 monitoring data and calculation of the concentration in background monitoring wells. Determination of background quality shall be made using the methods described in Title 27 CCR, Section 20415(e)(10), and shall be based on data from at least eight consecutive quarterly (or more frequent) groundwater monitoring events. For each monitoring parameter/constituent, the report shall compare the calculated background concentration with the interim numeric limitations set forth in Groundwater Limitation E.1.a. Where background concentrations are statistically greater than the interim limitations specified in Groundwater Limitation E.1.a, the report shall recommend final groundwater limitations which comply with Resolution 68-16 for the waste constituents listed therein. Subsequent use of a concentration as a final groundwater limitation will be subject to the approval of the Executive Officer.

2. If groundwater monitoring results show that the discharge of waste is causing groundwater to contain waste constituents in concentrations statistically greater than background water quality then, within **120 days** of the request of the Executive Officer, the Discharger shall submit a *BPTC Evaluation Workplan* that sets forth the scope and schedule for a systematic and comprehensive technical evaluation of each component of the facility's waste treatment and disposal system to determine best practicable treatment and control for each waste constituent listed in the Groundwater Limitation E.1.a of this Order. The workplan shall contain a preliminary evaluation of each component of the WWTP and effluent disposal system and propose a time schedule for completing the comprehensive technical evaluation. The schedule to complete the evaluation shall be as short as practicable, and shall not exceed one year.

3. 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 investigations and studies, 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 bear the professional's signature and stamp.

4. The Discharger shall comply with Monitoring and Reporting Program No. R5-2007-0125, which is part of this Order, and any revisions thereto as ordered by the Executive Officer.

5. 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)."

6. The Discharger shall use the best practicable cost-effective control technique(s) including proper operation and maintenance, to comply with discharge limits specified in this order.

7. The Discharger shall provide certified wastewater treatment plant operators in accordance with Title 23CCR, Division 3, Chapter 26.

8. As described in the Standard Provisions, the Discharger shall report promptly to the Regional Water Board any material change or proposed change in the character, location, or volume of the discharge.

9. Upon the reduction, loss, or failure of the sanitary sewer system resulting in a sanitary sewer overflow, the Discharger shall take any necessary remedial action to (a) control or limit the volume of sewage discharged, (b) terminate the sewage discharge as rapidly as possible, and (c) recover as much as possible of the sewage

discharged (including wash down water) for proper disposal. The Discharger shall implement all applicable remedial actions including, but not limited to, the following:

a. Interception and rerouting of sewage flows around the sewage line failure;

b. Vacuum truck recovery of sanitary sewer overflows and wash down water;

c. Use of portable aerators where complete recovery of the sanitary sewer overflows are not practicable and where severe oxygen depletion is expected in surface waters; and

d. Cleanup of sewage-related debris at the overflow site.

10. The Discharger shall report to the Regional Water 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."

11. The Discharger shall not allow pollutant-free wastewater to be discharged into the wastewater collection, treatment, and disposal system in amounts that significantly diminish the system's capability to comply with this Order. Pollutant-free wastewater means rainfall, groundwater, cooling waters, and condensates that are essentially free of pollutants.

12. The Discharger shall submit to the Regional Water 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 Water Board in writing when it returns to compliance with the time schedule.

13. In the event of any change in control or ownership of the facility or wastewater disposal areas, the Discharger must notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be immediately forwarded to this office. To assume operation as Discharger under this Order, the succeeding owner or operator must apply in writing to the Executive Officer requesting transfer of the Order. The request must contain the requesting entity's full legal name, the state of incorporation if a corporation, the name and address and telephone number of the persons responsible for contact with the Regional Water Board, and a statement. The statement shall comply with the signatory paragraph of Standard Provision B.3 and state that the new owner or operator assumes full responsibility for compliance with this Order. Failure to submit the request shall be considered a discharge without requirements, a violation of the California Water Code. Transfer shall be approved or disapproved by the Executive Officer.

14. 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 Water Board or court

orders requiring corrective action or imposing civil monetary liability, or in revision or recession of this Order.

15. A copy of this Order shall be kept at the discharge facility for reference by operating personnel. Key operating personnel shall be familiar with its contents.

16. The Regional Water Board will review this Order periodically and will 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 14 September 2007.

PAMELA C. CREEDON, Executive Officer

JSK/WSW: 14 Sep 07

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2007-0125

FOR
KIRKWOOD MEADOWS PUBLIC UTILITY DISTRICT
WASTEWATER TREATMENT PLANT
ALPINE AND AMADOR COUNTIES

This Monitoring and Reporting Program (MRP) presents requirements for monitoring of wastewater influent, effluent, wastewater disposal areas (i.e., leachfields), groundwater, sludge, and water supply. 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. Specific sample station locations shall be approved by Regional Board staff prior to implementation of sampling activities.

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

Field testing 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. Instruments are serviced and calibrated per manufacturer's recommendations; and
3. Field calibration reports are submitted as described in the "Reporting" section of this MRP.

INFLUENT MONITORING

Influent samples shall be collected at the same frequency and at approximately the same time as effluent samples and should be representative of the influent at the headworks prior to treatment. Influent monitoring shall include, at a minimum the following:

Constituent	Units	Type of Sample	Sampling Frequency	Reporting Frequency
Flow[1]	gpd	Continuous	Daily	Monthly
BOD[2]	mg/l	Grab	Monthly	Monthly

[1] Influent flows shall be measured with a meter beginning on 1 December 2007.
[2] 5-day biochemical oxygen demand.

EMERGENCY STORAGE BASIN MONITORING

Monitoring of freeboard in the emergency storage basin shall be conducted on a daily basis when the emergency storage basin is in use. Results of daily freeboard monitoring shall be provided in the monthly monitoring reports. If the emergency storage basin was not used during the month, the monthly monitoring report shall state so.

EFFLUENT MONITORING

Effluent samples shall be collected downstream from the last connection through which wastes can be discharged to the leachfields. At a minimum, effluent monitoring shall consist of the following:

Constituent	Units	Type of Sample	Sampling Frequency	Reporting Frequency
Total Flow to leachfields	gpd	Meter	Daily	Monthly
Flows to each leachfield	gpd	Calculated	Weekly	Monthly
BOD[2]	mg/L	Grab	Weekly	Monthly
pH	Standard Units	Grab	Weekly	Monthly
Total Coliform Organisms	MPN[3]/100 ml	Grab	Weekly	Monthly
Total Phosphorous	mg/L	Grab	Monthly	Monthly
Total Nitrate as N	mg/L	Grab	Monthly	Monthly
TKN as N	mg/L	Grab	Monthly	Monthly
Total Dissolved Solids	mg/L	Grab	Monthly	Monthly
Standard Minerals [4]	mg/L	Grab	Annually	Annually
Trihalomethanes[5]	ug/L	Grab	Annually	Annually

[1] Include leachfield number and flow
[2] 5-day Biochemical Oxygen Demand
[3] Most Probable Number
[4] Standard Minerals shall include, at a minimum, the following elements/compounds: boron, calcium, chloride, iron, magnesium, manganese, potassium, sodium, sulfate, total alkalinity (including alkalinity series), and hardness.
[5] Method 8020 or equivalent; to include bromoform, bromodichloromethane, chloroform, and dibromochloromethane and detection limits of 0.5 ug/L or less.

WASTEWATER DISPOSAL AREA MONITORING

The Discharger shall conduct a visual inspection of the wastewater disposal areas (leachfields) on a **weekly basis**. Results shall be recorded and submitted with the monthly monitoring report. Photocopies of entries into an operator's log are acceptable. Evidence of surfacing wastewater, erosion, field saturation, runoff, or the presence of nuisance conditions shall be noted in the report. If surfacing water is found, then a sample shall be collected and tested for total coliform organisms and total dissolved solids. In addition to the visual inspections, monitoring of the leachfields shall include the following:

Constituent	Units	Type of Sample	Sampling Frequency	Reporting Frequency
Application Rate[1]	gal/acre•day	Calculated	Monthly	Monthly
Leachfield Monitoring Port Inspection[2]	Inches	Measurement	Weekly	Monthly

[1] The application rate for each leachfield.
[2] The Discharger shall measure and record the distance from the surface of the liquid in each monitoring port to the surface of the ground in the active lateral(s). In addition, the Discharger shall record when leachfields are switched.

GROUNDWATER MONITORING

This sampling program is effective with the 4th quarter 2007. 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 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:

Constituent	Units	Type of Sample	Sampling and Reporting Frequency[4]
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
Total Coliform Organisms[2]	MPN/100ml	Grab	Quarterly
pH	S.U.	Grab	Quarterly
Total Dissolved Solids	mg/l	Grab	Quarterly
Nitrates as Nitrogen	mg/l	Grab	Quarterly
Total Kjeldahl nitrogen	mg/l	Grab	Quarterly
Standard Minerals[3]	mg/l	Grab	Annually
Total Trihalomethanes[5]	ug/L	Grab	Annually
Metals [6]	mg/l	Grab	Annually

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 Standard Minerals shall include, at a minimum, the following elements and compounds: boron, calcium, chloride, iron, magnesium, manganese, potassium, sodium, sulfate, total alkalinity (including alkalinity series), and hardness.

4 Beginning 4th Quarter 2007.

5 EPA Method 8020 or equivalent.

6 At a minimum, the following metals shall be included: arsenic, copper, lead, iron, manganese, nickel, and zinc. Analytical methods shall be selected to provide reporting limits below the Water Quality Limit for each constituent.

BIOSOLIDS MONITORING

The Discharger shall keep records regarding the quantity of biosolids generated by the treatment processes; any sampling and analytical data; the quantity of biosolids stored on site; and the quantity removed for disposal. The records shall also indicate that steps taken to reduce odor and other nuisance conditions. Records shall be stored onsite and available for review during inspections.

If biosolids are transported off-site for disposal, then the Discharger shall submit records identifying the hauling company, the amount of biosolids transported, the date removed from the facility, the location of disposal, and copies of all analytical data required by the entity

accepting the waste.

All records shall be submitted as part of the Annual Monitoring Report.

WATER SUPPLY MONITORING

A sampling station shall be established where a representative sample of the municipal water supply can be obtained. Water supply monitoring shall include at least the following for each water source used during the previous year. As an alternative to annual water supply monitoring, the Discharger may submit results of the most current DHS water supply monitoring data.

Constituents	Units	Sampling Frequency	Reporting Frequency
Total Dissolved Solids	mg/L	Annually	Annually
Total Nitrogen as N	mg/L	Annually	Annually
pH	pH units	Annually	Annually
Standard Minerals [1]	mg/L	Annually	Annually

[1] Standard Minerals shall include, at a minimum, the following elements/compounds: boron, calcium, chloride, iron, magnesium, manganese, potassium, sodium, sulfate, total alkalinity (including alkalinity series), and hardness.

REPORTING

In reporting monitoring data, the Discharger shall arrange the data in tabular form so that the date, sample type (e.g., influent, effluent, emergency storage basin, absorption bed, 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 by the registered professional.

A. Monthly Monitoring Reports

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

1. Results of the influent, effluent, and absorption bed monitoring;
2. Copies of inspection logs;
3. A comparison of the monitoring data to the discharge specifications and an explanation of any violation of those requirements;
4. If requested by staff, copies of laboratory analytical report(s); and
5. A calibration log verifying calibration of all hand-held monitoring instruments and

devices used to comply with the prescribed monitoring program.

B. Quarterly Report

Beginning with the fourth quarter 2007, the Discharger shall establish a quarterly sampling schedule for 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 quarter is due by May 1st) and may be combined with the monthly report. The Quarterly Report shall include the following:

1. Results of 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 discussion of seasonal trends if any;

4. A narrative discussion of the analytical results for all groundwater locations monitored including spatial and temporal tends, 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 December monitoring report for the last sampling event of the year;

2. If requested by staff, tabular and graphical summaries of all data collected during the year;

3. An evaluation of the performance of the domestic wastewater treatment system the groundwater quality beneath the wastewater treatment facility;

4. Summary of information on the disposal of biosolids as described in the “Biosolids Monitoring” section;

5. A discussion of whether the Discharger anticipates removing biosolids in the coming year, and if so, the anticipated schedule for cleaning, drying, and disposal;

6. 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;

7. A discussion of any data gaps and potential deficiencies/redundancies in the monitoring system or reporting program;

8. A description of any additional measures taken to reduce nitrogen concentrations in effluent.

9. A copy of the certification for each certified wastewater treatment plant operator working at the facility and a statement about whether the Discharger is in compliance with Title 23, CCR, Division 3, Chapter 26.

10. The results from annual monitoring of the effluent, groundwater, and water supply;

11. A forecast of influent flows, as described in Standard Provision No. E.4;

12. A statement of when the O&M Manual was last reviewed for adequacy, and a description of any changes made during the year;

13. Copies of equipment maintenance and calibration records (including influent flow meter), as described in Standard Provision No. C.4; and

14. A discussion of the following:

    a. Compliance with the interim effluent performance limits for salinity and nitrogen as specified in the Effluent Limitations of the WDRs;

    b. Salinity and nitrogen reduction efforts implemented in accordance the approved workplans;

    c. Other best practical treatment and control measures implemented pursuant to

any approved BPTC Workplan (if required by the Executive Officer); and

d. Based on monitoring data, an evaluation of the salinity and nitrogen reduction and/or BPTC measures that were implemented.

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 the penalty of perjury statement by the Discharger, or the Discharger's authorized agent, as described in the Standard Provisions General Reporting Requirements Section B.3.

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

Ordered by: _____
PAMELA C. CREEDON, Executive Officer
14 September 2007
(Date)

JSK/WSW: 14 Sep 07

INFORMATION SHEET

ORDER NO. R5-2007-0125
KIRKWOOD MEADOWS PUBLIC UTILITY DISTRICT
WASTEWATER TREATMENT PLANT
ALPINE AND AMADOR COUNTIES

Background

Kirkwood Meadows Public Utility District (KMPUD) owns and operates a wastewater treatment plant that serves the community of Kirkwood Meadows in Alpine and Amador Counties. Sources of wastewater treated and disposed of by the WWTP include wastes generated from residential and commercial units, and the Kirkwood Ski Resort.

In the fall of 2005, KMPUD upgraded its WWTP from a conventional activated sludge treatment process to a membrane bioreactor (MBR) treatment process. The upgraded wastewater treatment, which is designed to treat and dispose of 190,000 gallons per day (monthly average), provides tertiary treatment and disinfection. The treatment process includes influent screening, equalization storage, anoxic basins for denitrification, chemical additives for phosphorus removal, aeration basins, membrane basins, membrane filtration, disinfection with sodium hypochlorite, an effluent pump system, and emergency storage. Wastewater is disposed via subsurface leachfields.

Due to significant snowfall accumulation in the winter, the wastewater treatment system is largely located indoors. All key wastewater treatment mechanical equipment systems, pumping systems, and aeration units are provided with redundant standby units so that treatment can proceed at full capacity, even when a piece of equipment fails or is taken out of service for maintenance.

Solids and Biosolids Disposal

Screenings and grit removed from the influent wastewater is accumulated in a bagging unit and are picked up weekly for off-site disposal Biological sludge waste from the MBR treatment process is accumulated and partially digested in an aerated solids holding tank, prior to being dewatered in a centrifuge unit. The dewatered sludge is disposed of at an off site landfill by a commercial hauling service.

Basin Plan, Beneficial Uses, and Regulatory Considerations

Surface water from the effluent disposal area flows to Kirkwood Creek, which is a tributary to Caples Creek. Caples Creek flows into the Silver Fork of the American River, which flows into the South Fork of the American River. The *Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region, Fourth Edition* (Basin Plan), designates beneficial uses, establishes water quality objectives, and contains implementation plans and policies for all waters of the Basin. Beneficial uses often determine the water quality objectives that apply to a water body. For example, waters designated as municipal and domestic supply must meet the maximum contaminant levels (MCLs) for drinking waters. The Basin Plan sets forth the applicable beneficial uses (industrial, agricultural, and domestic and municipal 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

The antidegradation directives of State Water Board Resolution No. 68-16, "Statement of Policy With Respect to Maintaining High Quality Waters in California," or "Antidegradation Policy" require that waters of the State that are better in quality than established water quality objectives be maintained "consistent with the maximum benefit to the people of the State." 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.

Resolution 68-16 is applied on a case-by-case, constituent-by-constituent basis in determining whether a certain degree of 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 water 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 and control;
- The extent the discharge will impact the quality of each aquifer; and
- The expected degree of degradation below water quality objectives.

In allowing a discharge, the Regional Water Board must comply with CWC Section 13263 in setting appropriate conditions. The Regional Water Board is required, relative to the groundwater 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 for that purpose. The Regional Board need not authorize the full utilization of the waste assimilation capacity of the groundwater (CWC 13263(b)) and must consider other waste discharges and factors that affect that capacity.

Certain domestic wastewater constituents are not fully amenable to waste treatment and control and it is reasonable to expect some impact on groundwater. Some degradation for certain constituents is consistent with maximum benefit to the people of California because the technology, energy, water recycling, and waste management advantages of municipal utility service to the State far outweigh the environmental impact of a community that would otherwise be reliant on numerous concentrated individual wastewater systems. Economic prosperity of local communities is of maximum benefit to the people of California, and therefore sufficient reason to accommodate 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 but does not authorize pollution (i.e., violation of any water quality objective).

No groundwater monitoring wells currently exist upgradient or downgradient of the wastewater disposal areas; therefore, staff was unable to establish the most appropriate groundwater limits. In addition, certain aspects of wastewater treatment and control practices may not be justified as representative of Best Practicable Treatment and Control (BPTC). Reasonable time is necessary to gather specific information about the WWTP to make informed, appropriate, long-term decisions. This Order, therefore, establishes interim groundwater limitations to assure protection of the beneficial uses of groundwater of the State pending the completion of certain tasks and provides time schedules to complete those tasks. During this period, degradation may occur from certain constituents, but cannot exceed water quality objectives (or natural background water quality should it exceed objectives) or cause nuisance.

According to the Basin Plan, 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 unaffected by the discharge of waste already exceeds the objective. The interim groundwater limits below apply numeric and narrative water quality objectives that must be met to maintain specific beneficial uses of groundwater. The constituents listed are those that are expected to be found in treated domestic wastewater or to be released from the soil upon the application of such waste. The *Policy for Application of Water Quality Objectives* in Chapter IV of the Basin Plan provides a mechanism to apply narrative objectives using relevant and appropriate numeric limits published by other agencies and organizations. Due to the expected high quality of natural background groundwater in the location of the discharge, numeric limits were selected so as to require that conditions of nuisance, adverse tastes and odors, toxicity, or impact to sensitive agricultural uses would not be expected to occur. For the same reason, where incorporated drinking water MCLs are expressed as ranges, limits were selected that represent no impact on the municipal or domestic supply beneficial use. Unless natural background for a constituent proves to be higher, the groundwater quality limit established in proposed Order is the most stringent of the values for the listed constituents. Once the discharger provides information on background water quality and best practicable treatment or control, the groundwater limits may need to be adjusted (see *Reopener* below).

Constituent	Units	Limit	Beneficial Use	Water Quality Objective	Criteria or Justification
Ammonia	mg/L	1.5	MUN [1]	Tastes and Odors	Odor Threshold [2]
Boron	mg/L	0.7	AGR [3]	Chemical Constituents	Protect sensitive crops [4]
	mg/L	1.0	MUN[1]	Toxicity	Calif. Drinking Water Notification Level based on toxicity[11]
Chloride	mg/L	106	AGR [3]	Chemical	Sensitivity of certain

Constituent	Units	Limit	Beneficial Use	Water Quality Objective	Criteria or Justification
				Constituents	crops irrigated via sprinklers [4]
		142	AGR [3]	Chemical Constituents	Chloride sensitivity on certain crops [4]
		250	MUN [1]	Chemical Constituents	Recommended Secondary MCL [5]
		500	MUN [1]	Chemical Constituents	Upper Secondary MCL [5]
Iron	mg/L	0.3	MUN [1]	Chemical Constituents	Secondary MCL [6]
Manganese	mg/L	0.05	MUN [1]	Chemical Constituents	Secondary MCL [6]
Nitrate plus Nitrite as N	mg/L	10	MUN [1]	Chemical Constituents	Primary MCL [7]
Nitrite as N	mg/L	1	MUN [1]	Chemical Constituents	Primary MCL [7]
Sodium	mg/L	69	AGR [3]	Chemical Constituents	Sensitivity of certain crops [4]
Total Dissolved Solids	mg/L	450[8]	AGR [3]	Chemical Constituents	Crop sensitivity [4]
		500	MUN [1]	Chemical Constituents	Recommended Secondary MCL [5]
		1,000	MUN [1]	Chemical Constituents	Upper Secondary MCL [5]
Total Coliform Organisms	MPN/100 ml	<2.2	MUN [1]	Bacteria	Basin Plan and non-detect
Trihalomethanes	µg/L	80	MUN [1]	Chemical Constituents	MCL [8]
Bromoform	µg/L	4	MUN [1]	Toxicity	USEPA IRIS Cancer Risk Level [9]
Bromodichloromethane	µg/L	0.27	MUN [1]	Toxicity	Cal/EPA Cancer Potency Factor [12]
Chloroform	µg/L	1.1	MUN [1]	Toxicity	Cal/EPA Cancer Potency Factor [12]
Dibromochloromethane	µg/L	0.37	MUN [1]	Toxicity	Cal/EPA Cancer Potency Factor [12]
pH	pH Units	6.5 to 8.5	MUN [1]	Chemical Constituents	Secondary MCL [10]
		6.5 to 8.4	AGR [3]	Chemical Constituents	Protect sensitive crops [4]

1 Municipal and domestic supply
2 J.E. Amoore 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 which is incorporated by reference into the Basin Plan.
6 Title 22, CCR, Section 64449, Table 64449-A which is incorporated by reference into the Basin Plan.

7 Title 22, CCR, Section 64431, Table 64431-A which is incorporated by reference into the Basin Plan.
8 Title 22, CCR, Section 64439, which applies the narrative objective to fully protect the cited beneficial use.
9 USEPA Integrated Risk Information System, http://www.epa.gov/iris.
10 Title 40, Code of Federal Regulations, Section 143.3, which applies the narrative objective to fully protect the cited beneficial use.
11 California Department of Health Services, Division of Drinking Water and Environmental Management, Drinking Water Notification Levels, http://www.dhs.ca.gov/ps/ddwem.
12 CAL/EPA Toxicity Criteria Database (OEHHA), http://www.oehha.org/risk/ChemicalDB.

Domestic wastewater contains numerous dissolved organic and inorganic constituents that together comprise Total Dissolved Solids (TDS). Each component constituent is not individually critical to any beneficial use. Critical constituents are individually listed. The cumulative impact from the 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. The relevant numerical water quality limit for salinity is 450 mg/L, and is used through Basin Plan procedures to apply the narrative Chemical Constituents water quality objective for the protection of agricultural supply, the beneficial use most sensitive to TDS. This limit assumes no impact on sensitive agricultural uses, consistent with the high quality of expected natural background water quality in the area of the discharge. Most individual salt components can safely be assumed to be proportionately low such that TDS can be an effective indicator parameter in their regulation.

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. As chloride concentrations in most groundwaters in the region are much lower than in treated municipal wastewater, chloride is a useful indicator parameter for evaluating the extent to which effluent reaches groundwater. Boron is another TDS constituent that may occur in wastewater in concentrations greater than groundwater depending on the source water and the extent residents use cleaning products containing boron. Other indicator constituents for monitoring for groundwater degradation due to recharged effluent include total coliform bacteria, ammonia and total nitrogen, and Total Trihalomethanes (TTHMs), a by-product of chlorination.

A Groundwater Limitation for chloroform is included in this Order and is based on the Basin Plan Toxicity objective and OEHHA Toxicity Criteria for the protection of human health. The Office of Environmental Health Hazard Assessment (OEHHA) has published and maintains the Toxicity Criteria Database, which contains cancer potency factors for chemicals, including chloroform, that have been used as a basis for regulatory actions by the boards, departments and offices within the California Environmental Protection Agency (Cal/EPA). The cancer potency factor for oral exposure to chloroform in this database is 0.031 milligrams per kilogram body weight per day (mg/kg-day). By applying standard toxicologic assumptions used by OEHHA, USEPA and other environmental agencies in evaluating health risks via drinking water exposure (i.e., 70 kg body weight and 2 liters per day water consumption), this cancer potency factor is equivalent to a concentration in drinking water of 1.1 ug/L (ppb) at the 1-in-a-

million cancer risk level. The 1-in-a-million risk level is consistent with that used by the Department of Health Services (DHS) to set de minimis risks from involuntary exposure to carcinogens in drinking water in the development of drinking water MCLs and Action Levels and by OEHHA to set negligible cancer risks in the development of Public Health Goals for drinking water. The one-in-a-million cancer risk level is also mandated by USEPA in applying human health protective criteria contained in the National Toxics Rule and the California Toxics Rule for priority toxic pollutants in California surface waters.

Similarly, Groundwater Limitations for bromoform, bromodichloromethane, and dibromochloromethane are included in this Order and are based on the Basin Plan Toxicity objective and USEPA IRIS cancer risk levels for the protection of human health. The U.S. Environmental Protection Agency maintains the Intetrated Risk Information System (IRIS), which contains concentrations of constituents in drinking water associated with specified cancer risk levels. The Groundwater Limitations for bromoform, bromodichloromethane, and dibromochloromethane were selected from IRIS based on the 1-in-a-million risk level. Assumptions and rationale for selection of these limitations are identical to those discussed above for chloroform.

Treatment Technology and Control

Given the character of domestic wastewater, tertiary treatment technology is generally sufficient to control degradation of groundwater from decomposable organic constituents. Adding disinfection significantly reduces populations of pathogenic organisms, and reasonable soil infiltration rates and unsaturated soils can reduce them further. Neither organics nor total coliform organisms, the indicator parameter for pathogenic organisms, should be found in groundwater in a well-designed, well-operated facility. The bacteria objective in the Basin Plan, cited as a groundwater limitation in the order, is equivalent to requiring that coliform organisms not be detected in groundwater. Due to the high quality of groundwater quality within the Kirkwood Meadows Valley, the Discharger has elected to perform tertiary treatment with chlorine disinfection on the wastewater. Chlorine disinfection of effluent causes formation of trihalomethanes, which are toxic priority pollutants. Treatment to reduce these in wastewater generally has not been performed, and little is known at this point on the typical impact on groundwater.

Domestic wastewater typically contains nitrogen in concentrations greater than water quality objectives, which vary according to the form of nitrogen. The WWTP has a nitrification/denitrification activated sludge treatment process, which is usually considered BPTC for nitrogen compounds. Such a process typically can produce an effluent with total nitrogen concentrations of less that 10 mg/L. However, KMPUD’s wastewater is not typical because of cold temperatures, variable flows related to resort activities, and variable strengths of waste due to I&I and water conservation practices. Wastewater strength has a direct impact on the ability of a MBR nitrification/denitrification activated sludge treatment process to achieve a total nitrogen effluent of less than 10mg/L. Wastewater effluent concentrations for nitrogen

range from approximately 4.5 to 45 mg/L. Background groundwater concentrations appear to be approximately 1.0 mg/L for total nitrogen (see Finding # 35). Based on these effluent concentrations and the apparent background groundwater quality, the current wastewater treatment process for nitrogen compounds does not appear adequate to protect the underlying groundwater from pollution by nitrogen compounds. This Order requires the Discharger to submit a *BPTC Evaluation Workplan* to evaluate the facility's waste treatment and disposal system to determine additional best practicable treatment and control for nitrogen compounds.

Waste constituents that are forms of salinity pass through the treatment process and soil profile and effective control of long-term affects relies upon effective source control. Long-term discharge of domestic wastewater with higher concentrations of TDS than groundwater will degrade that groundwater. The quality of source water for the KMPUD is very good, with a TDS of approximately 160 mg/L. Salt addition through use higher than the expected range, as effluent reveals a TDS of approximately 495 mg/L. For comparison, the national average increment for TDS ranges from 100 to 300 mg/L, according to *Wastewater Engineering* by Metcalf & Eddy; the incremental maximum in the Basin Plan for the Tulare Lake Basin is 500 umhos/cm (about 300 mg/L); and the incremental average standard allowed in the Santa Ana Basin in 230 mg/L. The proposed Order sets for interim effluent limits at the current discharge concentration, while requiring the development of salinity reduction BPTC measures.

Other constituents in domestic wastewater that may pass through the treatment process and the soil profile, include recalcitrant organic compounds, radionuclides, and pharmaceuticals. Hazardous compounds are not usually associated with domestic wastewater and when present are reduced in the discharge to inconsequential concentrations through dilution and treatment. It is inappropriate to allow degradation of groundwater with such constituents.

A discharge of wastewater that overloads soils with nutrients and organics can result in anaerobic conditions in the soil profile, which in turn creates organic acids and decreases soil pH. Under conditions of low soil pH (below 5), iron and manganese compounds in the soil can solubilize and leach into groundwater. Though iron and manganese limits are set at the numerical water quality objectives (MCLs incorporated by reference), groundwater pH is expected to remain the same as background.

Title 27

Title 27, CCR, Section 20005 et seq. (Title 27), contains regulations to address certain discharges to land. Title 27 establishes a waste classification system, specifies siting and construction standards for containment of classified waste, 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 under Title 27 regulations.

Discharges of domestic wastewater 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. Discharges of domestic sewage and treated effluent which are regulated by WDRs and treatment and storage facilities associated with the WWTP are considered exempt from Title 27 under Section 20090(a), provided that the discharges and facilities will not result in a violation of any water quality objective. As the exemption specifically excludes the discharge to land of: 1) solid waste such as grit and screenings that result from treatment of domestic sewage, and 2) residual sludge that will not be further treated at the WWTP, such discharges must comply with provisions of Title 27.

The discharge of wastewater and the operation of treatment and/or storage facilities associated with a wastewater treatment plant can be allowed without requiring compliance with Title 27 only if groundwater degradation complies with the Basin Plan, Resolution No. 68-16 (Antidegradation Policy), and does not violate any water quality objectives.

Proposed Order Terms and Conditions

Discharge Prohibitions and Specifications

The proposed Order establishes a monthly average discharge flow limit of 190,000 gpd and a peak daily flow of 274,000 gallons.

The proposed Order's Effluent Limitations for BOD_5 are based on the predicted effluent quality as stated in the RWD. The RWD did not predict TDS quality; that limit is based on the current performance of the facility, as is the nitrogen effluent limit. Both of these limits are interim values, and will be revised upon the Discharger's completion of BPTC studies.

Monitoring Requirements

Section 13267 of the CWC 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, and thereby improving accountability of any discharger for meeting the conditions of discharge. Section 13268 of the CWC authorizes assessment civil administrative liability where appropriate.

The proposed Order includes influent and effluent monitoring requirements, land disposal (leachfields) area monitoring, groundwater monitoring, sludge monitoring, and water supply monitoring. In order to adequately characterize effluent, the Discharger is required to monitor for BOD, total coliform organisms, TDS, nitrogen, phosphorous, pH, and other constituents. Monitoring of additional minerals is required on an annual basis.

The Title 27 zero leakage protection strategy relies heavily on extensive groundwater monitoring to increase a discharger's awareness of, and accountability for, compliance with the prescriptive and performance standards. With wastewater being applied to land, monitoring takes on even greater importance. The proposed Order includes monitoring of effluent water quality, application rates, and groundwater quality.

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 land application of wastewater 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.

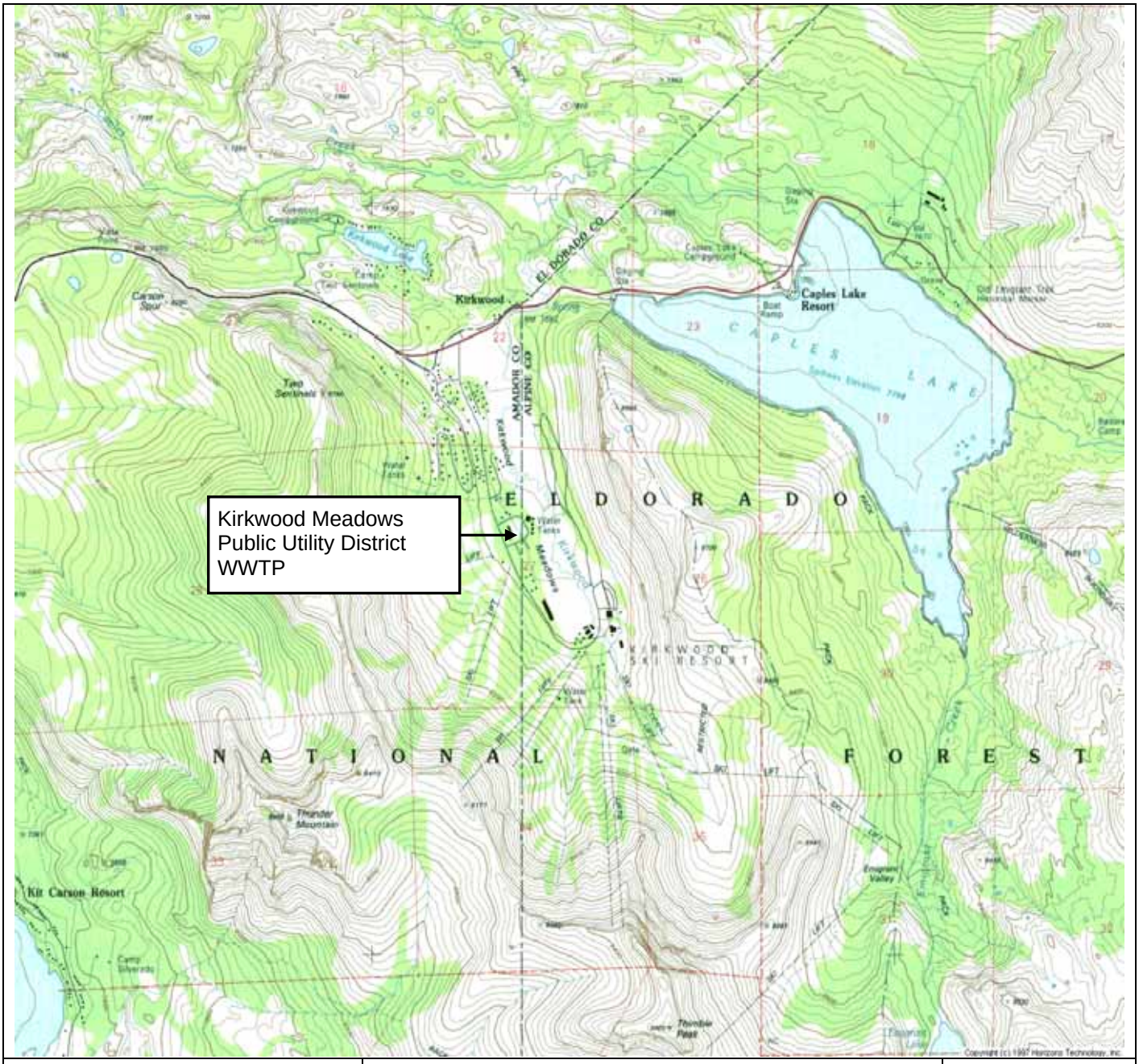
The Discharger must monitor groundwater for wastewater constituents expected to be present in the discharge, and capable of reaching groundwater, and violating groundwater limitations if its treatment, control, and environmental attenuation, proves inadequate. Background groundwater quality is not defined; this Order requires the Discharger to install and monitor groundwater monitoring wells upgradient and downgradient of the wastewater disposal areas to detect potential groundwater impacts.

For each constituent listed in the Groundwater Limitations section, the Discharger must, as part of each monitoring event, compare concentrations of constituents found in each monitoring well (or similar type of groundwater monitoring device) to the background concentration or to prescribed numerical limitations to determine compliance.

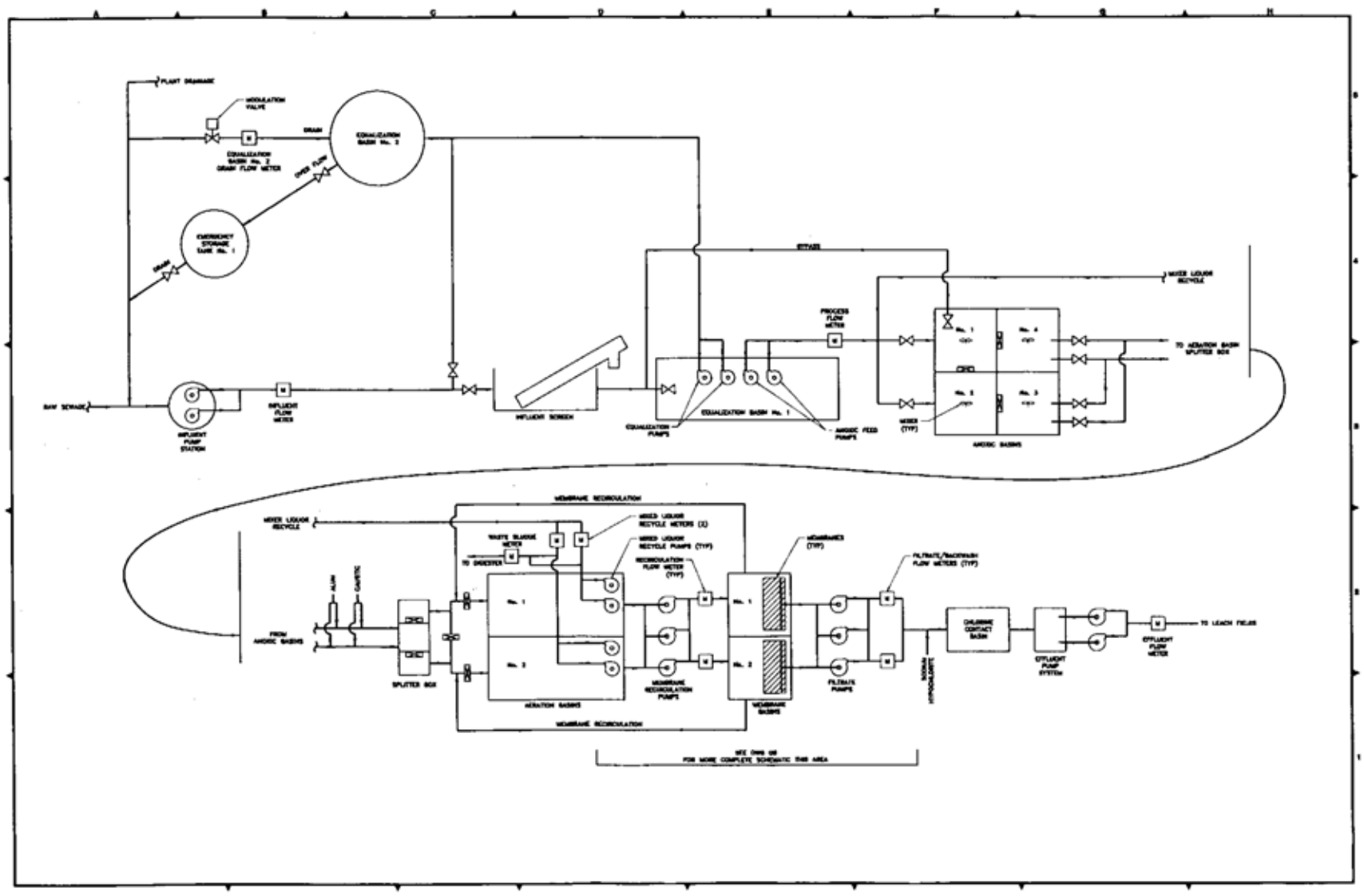
Reopener

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. As this additional information is obtained, decisions will be made concerning the best means of assuring the highest water quality possible and that could involve substantial cost. It may be appropriate to reopen the Order if applicable laws and regulations change. The CWC requires that waste discharge requirements implement all applicable requirements.

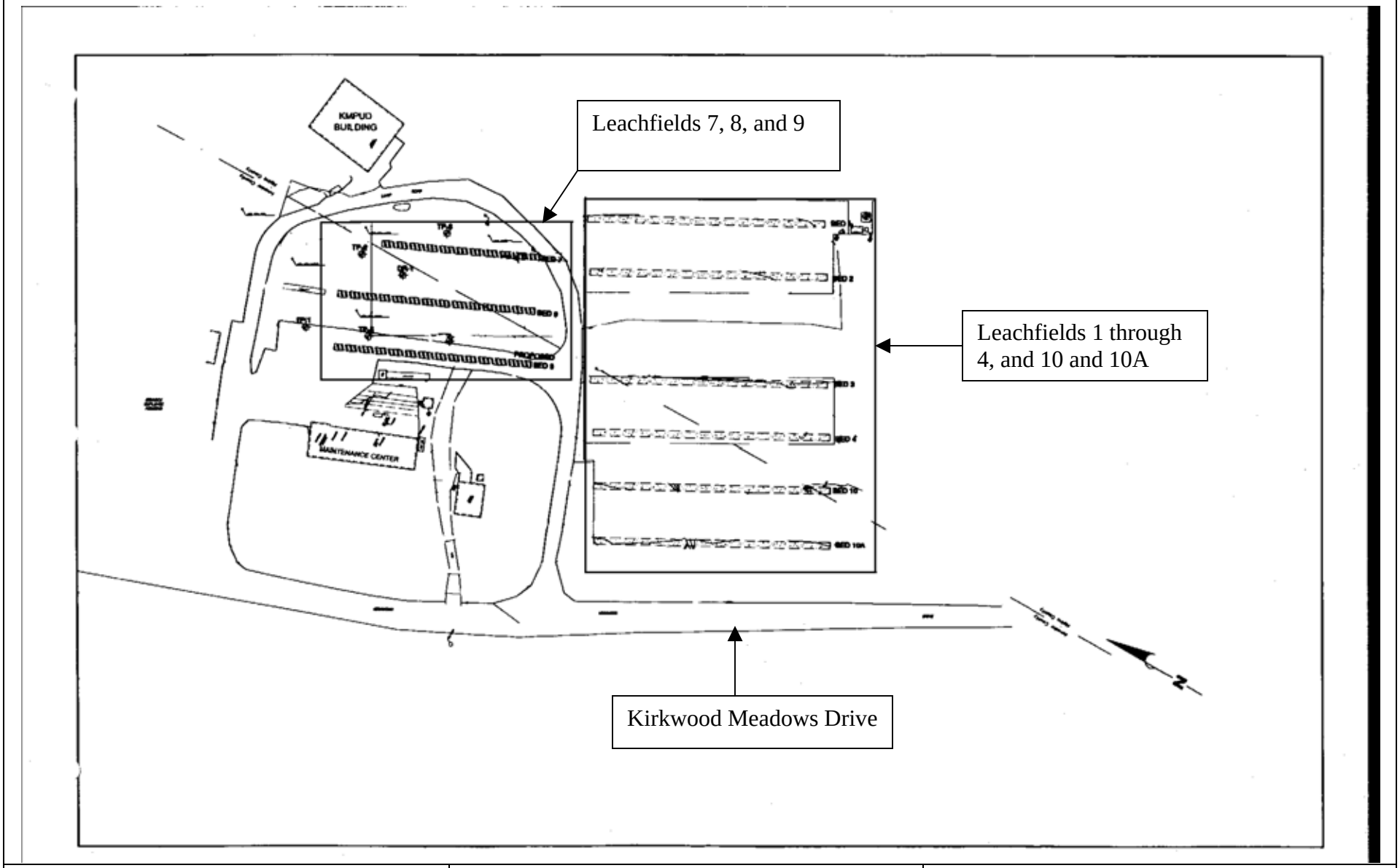
JSK/WSW:14 Sep 07



Drawing Reference: U.S.G.S TOPOGRAPHIC MAP 7.5 MINUTE QUADRANGLE	**SITE LOCATION MAP** KIRKWOOD MEADOWS PUBLIC UTILITY DISTRICT WASTEWATER TREATMENT PLANT	N W E S approx. scale 1 in.= 24,000 ft.



DRAWING REFERENCE: Kirkwood Meadows Public Utility District Report of Waste Discharge Figure 1	Kirkwood Meadows Public Utility District Wastewater Treatment Plant	N W E S



DRAWING REFERENCE: Kirkwood Meadows Public Utility District Report of Waste Discharge Figure 4	Kirkwood Meadows Public Utility District Wastewater Disposal Areas	

California Regional Water Quality Control Board
Central Valley Region
Karl E. Longley, ScD, P.E., Chair

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Arnold Schwarzenegger
Governor

ATTACHMENT D

ORDER NO. R5-2007-0125

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
- 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