

REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION
REVISED MONITORING AND REPORTING PROGRAM NO. 98-094

FOR
SIERRA PACIFIC INDUSTRIES INC.
CLEAN CLOSURE OF CLASS III WOOD WASTE LANDFILL, CLOSURE OF ASH DISPOSAL
AREA, AND CLEANUP OF DIP TANK AREA
AMADOR COUNTY

This Monitoring and Reporting Program (MRP) describes requirements for monitoring a Wood Waste Landfill, an unlined leachate basin associated with the Wood Waste Landfill, an Ash Disposal Area, a former dip tank area, groundwater, surface water, leachate, and seeps. Pursuant to Section 13267 of the California Water Code, the Discharger must comply with this MRP. Sierra Pacific Industries Inc. (Discharger) must not implement any changes to this MRP unless and until a revised MRP is issued by the Executive Officer.

The Discharger must comply with this MRP, with Title 27 California Code of Regulations §20005, et seq. (hereafter Title 27), and with the *Standard Provisions and Reporting Requirements for Title 27 (27 CCR §20005, et seq.)*, dated August 1997 (Standard Provisions), and as ordered by Waste Discharge Requirements Order No. 98-094 (WDRs). Further, the Discharger must fully disclose any monitoring, sampling, and analysis performed at this facility. Failure to comply with this MRP constitutes noncompliance with the Water Code, which can result in the imposition of civil monetary liability.

A. MONITORING

All monitoring must be conducted in accordance with a Sample Collection and Analysis Plan (SAP), which must include quality assurance and quality control standards which are acceptable to the Executive Officer. A SAP meeting the requirements in Section II of Attachment A is due by **1 April 2009**.

Any groundwater and leachate monitoring under this MRP must be performed **within the first month** of each monitoring period (i.e., January, April, July, and October). This will ensure that re-sample results are included within the relevant monitoring report. Monitoring under this MRP must begin **by January 2009, the first month of the first quarter of 2009**. All samples must be representative of the volume, nature, or matrix of material sampled. The time, date, and location of each sample must be recorded on the sample chain of custody form. If methods other than U.S. EPA-approved methods or *Standard Methods for the Examination of Water and Wastewater*, latest edition, are used, the exact methodology must be submitted for review and approval. All monitoring points must be sampled and analyzed for parameters and constituents of concern as indicated and listed herein. Unless otherwise approved by the Regional Water Board, any sampling and monitoring results must be reported. All relevant facts must be fully disclosed.

Field and monitoring parameters are Constituents of Concern that are the waste constituents, reaction products, hazardous constituents, and physical parameters that provide a reliable indication of a release from a Unit (i.e., the Wood Waste Landfill, unlined leachate basin, Ash Disposal Area, and dip tank area). The Constituents of Concern for all Units are those listed in

Tables 1 through 5 for the specified monitored medium and Table 6 for the analytes and analytical methods. All groundwater monitoring wells, leachate basin and seeps, and surface water monitoring points must be sampled and analyzed for the Constituents of Concern as indicated in Tables 1 through 5. Required analytes and test methods are listed in Table 6.

1. Monitoring Points

The existing evaluation, detection, and corrective action monitoring system for this facility must include the following:

Existing Monitoring Points

<u>Media</u>	<u>Location / Identification Number</u>
Groundwater	B-1, B-2, B-3, B-5, B6-R, B-7, B-8, B-9, B-10, B-11, B-12, B-13, B-14, B-15, B-16, LD-2A, D-12, D-13, D-14, D-15, D-16, and WQ-1. WQ-1 is owned by Ampine-Sierrapine.
Surface Water	Existing location SW-1 (adjacent to the open face of the Wood Waste Landfill) and existing location SW-2
Leachate Basin	Leachate Basin

Historical monitoring points that are no longer sampled include groundwater monitoring wells B-6, BH-6, BH-7, D-10, and D-11. The Discharger stated that groundwater monitoring wells BH-6, BH-7, D-10, and D-11 have been abandoned¹. The Discharger has requested, and has received concurrence from the Regional Water Board, to abandon well B-6 in the Fall of 2008.

The Discharger must maintain its storm water monitoring program for industrial activities. The Discharger is regulated under Water Quality Order No. 97-03-DWQ and General Permit No. CAS000001 (General Permit) for Discharges of Storm Water Associated with Industrial Activities, and must submit monitoring data according to the General Permit.

2. Groundwater Monitoring

General

The Discharger must operate and maintain a groundwater monitoring system that complies with the applicable provisions of Title 27 §20415 and §20420, and in accordance with this MRP, the Standard Provisions, and a SAP. The Discharger must collect, preserve, transport, and analyze groundwater samples in accordance with a SAP that has been reviewed by, and received concurrence of, the Regional Water Board. The monitoring system must be certified by a California-licensed professional civil engineer or geologist as meeting the requirements of Title 27.

¹ Page 7 of Sierra Pacific Industries' response to comments on Draft Revised MRP, received 12 June 2008.

Installation of Any New Wells

Whenever any new wells (including groundwater, gas, soil vapor, and etc.) are proposed, the Discharger must submit a monitoring well installation work plan that must include the information in Sections I and II of Attachment A. After installation, the Discharger must submit a monitoring well installation report within **60-days of installation** that must include the information in Section III of Attachment A. Whenever any new wells are installed, such wells must be incorporated into this MRP beginning with the quarter in which such wells are installed. Whenever any new wells are sampled, the analytical results must be included in the report for the monitoring period in which the wells were installed.

Groundwater Flow Rate and Directions

The Discharger must determine the groundwater flow rate and direction in the uppermost aquifer, in any zones of perched water, and in any additional zone of saturation monitored pursuant to this MRP.

Sampling and Analysis

Groundwater samples must be collected from the existing wells and any additional wells that may be installed at the facility in the future. Any groundwater sample obtained for monitoring must have a turbidity of less than 10 NTUs. Samples must be collected and analyzed for the Constituents of Concern in accordance with the methods and frequency specified in Table 1, 2, 3, and in Table 6. Organic Constituents of Concern must be analyzed for "total" concentrations.

Providing that samples are obtained and documented under **anoxic conditions**, that the samples are obtained first, are immediately preserved and stored, and that a **>10 micron polycarbonate membrane-type filter with uniform and sharp size cutoff** is used, iron and manganese groundwater samples may be filtered. After filtration, the filter itself must be analyzed for their particulate load. Please note that filtration of anoxic groundwater samples is very difficult without iron oxidation and colloid formation, causing removal of previously dissolved species to be filtered. Filter loading and clogging may also occur, thus reducing the nominal size of the filter. Pre-washing of filters must be routinely performed and documented in the monitoring report. Further, the EPA has documented that there is a strong inverse correlation between turbidity and representativeness of samples, and that samples with the least disturbance (i.e., turbidity) produced the most reproducible samples irrespective of filtration. Therefore, the Discharger is encouraged to use a low-flow sampling technique with flow rates of around 100-500 ml/minute. In order to avoid entrainment, the use of bailers and air-lift arrangements is discouraged.

The applicable inorganic Constituents of Concern must be evaluated with regards to the cation/anion balance, and the results must be graphically presented using a Stiff diagram, a Piper graph, or a Schueller plot.

Samples for the Constituents of Concern specified in Tables 1, 2, and 3 and must be collected and analyzed in accordance with the methods listed in Table 6.

Table 1

Wood Waste Landfill Groundwater Monitoring Program*

Wood Waste Landfill Groundwater Monitoring Wells

B-1, B-2, B-3, B-6R, B-7, B-8, B-9, B-10, B-11, B-12, B-13, B-14, and LD-2A

<u>Field Parameters*</u>	<u>Units</u>	<u>Frequency</u>
Groundwater Elevation	Ft. & hundredths, MSL	Quarterly
Temperature	°C	Quarterly
Electrical Conductivity	µmhos/cm	Quarterly
pH	pH units	Quarterly
Turbidity	Turbidity units	Quarterly
<u>Monitoring Parameters*</u>	<u>Units</u>	<u>Frequency</u>
Total Dissolved Solids	mg/L	Quarterly
Total Suspended Solids	mg/L	Quarterly
Chemical Oxygen Demand	mg/L	Quarterly
Dissolved General Minerals	mg/L	Quarterly
Total iron and manganese	mg/L	Quarterly
Tannins & Lignins	mg/L	Quarterly

Sample B-1, B-2, B-3, B-6R, B-8, B-10, B-11, B-12, B-13, B-14, and LD-2A beginning January 2009:

Dixons and Furans	pg/L	Semi-annual
Polynuclear Aromatic Hydrocarbons	ug/L	Semi-annual

Sample B-7 and B-9 every 5-years beginning January 2009, and thereafter every 5-years alternating between June and January:

Dixons and Furans	pg/L	5-years, beginning January 2009
Polynuclear Aromatic Hydrocarbons	ug/L	5-years, beginning January 2009

* Constituents of Concern must be prepared and analyzed for "total" concentrations unless otherwise approved by the Regional Water Board. See Table 6 for the list of analytes and analytical methods.

Table 2

Ash Disposal Area Groundwater Monitoring Program*

Ash Disposal Area Groundwater Monitoring Wells

B-5, B-15, B-16

<u>Field Parameters*</u>	<u>Units</u>	<u>Frequency</u>
Groundwater Elevation	Ft. & hundredths, MSL	Quarterly
Temperature	°C	Quarterly
Electrical Conductivity	µmhos/cm	Quarterly
pH	pH units	Quarterly
Turbidity	Turbidity units	Quarterly
<u>Monitoring Parameters*</u>	<u>Units</u>	<u>Frequency</u>
Total Dissolved Solids	mg/L	Quarterly
Total Suspended Solids	mg/L	Quarterly
Chemical Oxygen Demand	mg/L	Quarterly
Dissolved General Minerals	mg/L	Quarterly
Total iron and manganese	mg/L	Quarterly
Tannins & Lignins	mg/L	Quarterly
Dixons and Furans	pg/L	Semi-annual, beginning January 2009
Polynuclear Aromatic Hydrocarbons	ug/L	Semi-annual, beginning January 2009

* Constituents of Concern must be prepared and analyzed for "total" concentrations unless otherwise approved by the Regional Water Board. See Table 6 for the list of analytes and analytical methods.

**Table 3
Dip Tank Area Groundwater Monitoring Program***

Dip Tank Area Groundwater Monitoring Wells

WQ-1, D-12, D-13, D-14, D-15, and D-16

Sampling and analysis must begin starting with the First Quarter of 2009

<u>Field Parameters*</u>	<u>Units</u>	<u>Frequency</u>
Groundwater Elevation	Ft. & hundredths, MSL	Semi-annual
Temperature	°C	Semi-annual
Electrical Conductivity	µmhos/cm	Semi-annual
pH	pH units	Semi-annual
Turbidity	Turbidity units	Semi-annual
Dissolved oxygen	mg/L	Semi-annual
<u>Monitoring Parameters*</u>	<u>Units</u>	<u>Frequency</u>
Chlorinated Phenols	ug/L	Semi-annual
Dixons and Furans	pg/L	Semi-annual

* Constituents of Concern must be prepared and analyzed for "total" concentrations unless otherwise approved by the Regional Water Board. See Table 6 for the list of analytes and analytical methods. See Table 6 for the list of analytes and analytical methods.

3. Surface Water Monitoring

All surface water monitoring parameters must be analyzed for total concentrations, including organic and inorganic constituents. The Discharger must sample and analyze surface water at existing locations SW-1 and SW-2. Each surface water location must be sampled for two events **during the first hour of discharge during regular business hours** from

- (1) The first storm event of the wet season, and
- (2) At least one other storm event in the wet season.

If no rain event occurred during a monitoring period, this must be so stated in the monitoring report.

For all monitoring points assigned to surface water monitoring, samples must be collected, analyzed, and reported for the Constituents of Concern in accordance with the methods and frequency specified in Table 4. Constituents of Concern must be analyzed for "total" concentrations.

**Table 4
Surface Water Monitoring Program***

Surface Water Sampling Locations

SW-1 and SW-2

Field Parameters

Temperature	°C
Specific Conductance	µmhos/cm
pH	pH number
Dissolved oxygen	mg/L

Monitoring Frequency

For all parameters, collect the samples during the first hour during regular business hours of discharge from (1) the first storm event of the season and (2) from at least one other storm event of the season.

Monitoring Parameters

Total Dissolved Solids	mg/L
Total Suspended Solids	mg/L
Chemical Oxygen Demand	mg/L
Total iron and manganese	mg/L
Total General minerals	mg/L
Dioxins and Furans	pg/L

Monitoring Frequency

For all parameters, collect the samples during the first hour of discharge during regular business hours from (1) the first storm event of the season and (2) from at least one other storm event of the season.

* All Constituents of Concern must be prepared and analyzed for "total" concentrations. See Table 6 for the list of analytes and analytical methods.

4. Leachate Pond and Seep Monitoring

All leachate and seep samples must be analyzed for total concentrations of the Constituents of Concern. Leachate pond and seep samples must be collected and analyzed at the frequency and for the constituents of concern listed in Table 5.

Leachate Pond Liquids

The leachate pond freeboard must be recorded weekly, and the other parameters must be monitored semiannually as indicated in Table 5. Analytical methods must be those listed in Table 5 and 6.

Seeps

Any leachate which seeps to the surface from the Wood Waste Landfill, the unlined leachate basin, or the Ash Disposal Area must be immediately sampled and analyzed for the Constituents of Concern, including the Field Parameters and Monitoring Parameters, listed in Table 5 upon detection of any seep. Thereafter, any seep must be sampled at the frequencies listed in Table 5 (i.e., semi-annually). Analytical methods must be those listed in Table 6. The quantity of leachate from any seep must be estimated and reported as Leachate Flow Rate (in gallons/day).

Table 5
Leachate Pond and Seep Monitoring Program*

<u>Field Parameters*</u>	<u>Units</u>	<u>Frequency</u>
Freeboard, pond	feet & inches	Weekly
Leachate Flow rate, seep	gallons/day	On detection / weekly
Temperature	°C	On detection / Semi-annually
Electrical Conductivity	µmhos/cm	On detection / Semi-annually
pH	pH units	On detection / Semi-annually
Turbidity	Turbidity units	On detection / Semi-annually
Dissolved oxygen	mg/L	On detection / Semi-annually
<u>Monitoring Parameters*</u>	<u>Units</u>	<u>Frequency</u>
Total Dissolved Solids	mg/L	On detection / Semi-annually
Total Suspended Solids	mg/L	On detection / Semi-annually
Chemical Oxygen Demand	mg/L	On detection / Semi-annually
Biochemical Oxygen Demand	mg/L	On detection / Semi-annually
Total General Minerals	mg/L	On detection / Semi-annually
Total iron and manganese	mg/L	On detection / Semi-annually
Tannins & Lignins	mg/L	On detection / Semi-annually

* **Constituents of Concern must be prepared and analyzed for "total" concentrations, unless otherwise approved by the Regional Water Board. See Table 6 for the list of analytes and analytical methods.**

5. Facility Monitoring

a. Facility Inspection

Annually, prior to the anticipated rainy season, but no later than **30 September**, the Discharger must conduct an inspection of the facility. The inspection must assess damage to the drainage control system, the condition of the groundwater monitoring equipment (including wells, etc.), and must include the Standard Observations. Any necessary construction, maintenance, or repairs must be completed by **31 October**. By **15 November** of each year, the Discharger must submit an annual report describing the results of the inspection and repair measures implemented, including photographs of any problems encountered and the repairs made.

b. Storm Events

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

B. WATER QUALITY PROTECTION STANDARD

1. Water Quality Protection Standard Report

By 15 June 2009, the Discharger must submit a Water Quality Protection Standard Report for the Wood Waste Landfill, the unlined leachate basin, and the Ash Disposal Area.

- a. For each waste management unit (Unit), the Water Quality Protection Standard must consist of all Constituents of Concern, the concentration limit for each constituent of concern, the point of compliance, and all water quality monitoring points for each monitored medium. For the Water Quality Protection Standard Report, the Units include the Wood Waste Landfill, Leachate Basin, and the Ash Disposal Area. The Water Quality Protection Standard, or any modification thereto, must be submitted in a report for review and approval.
- b. The Water Quality Protection Standard report must:
 - i Identify **all distinct bodies of surface and ground water** that could be affected in the event of a release from a Unit or portion of a Unit. This list must include at least the uppermost aquifer and any permanent or ephemeral zones of perched groundwater underlying the facility.
 - ii Include a map (both hard copy and digital format) showing the monitoring points, including the background monitoring points, for the surface water monitoring program, groundwater monitoring program, any identified seeps, and the leachate pond monitoring point. The map must include the points of compliance in accordance with Title 27 §20405.
 - iii Evaluate and determine the perennial direction(s) of groundwater movement within the uppermost groundwater zone(s).
 - iv Include an electronic file with all historical and current analytical data in an Excel spreadsheet. The spreadsheet must include the location identifier (e.g., well number), results, units, method detection limits (MDLs), practical quantitation limits (PQL), trace concentrations, analyte, CAS number, analytical method number, sample date, and laboratory. A PDF file is not acceptable and will be rejected.
- c. The Water Quality Protection Standard report must be signed and stamped by a California-registered civil engineer or geologist as meeting the requirements of Title 27, and as required in Section E.3, *Reporting Requirements*, of this MRP.
- d. If subsequent sampling of the background monitoring point(s) indicates significant water quality changes due to either seasonal fluctuations or other reasons unrelated to waste management activities at the site, the Discharger may request modification of the Water Quality Protection Standard.

2. Constituents of Concern

Field and monitoring parameters are Constituents of Concern that are the waste constituents, reaction products, hazardous constituents, and physical parameters that provide a reliable indication of a release from a Unit. The Constituents of Concern for all Units are those listed in Tables 1 through 5 for the specified monitored medium and Table 6 for the analytes and analytical methods.

3. Concentration Limits

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

- a. By calculation in accordance with a statistical method pursuant to §20415 of Title 27(e)(8); or
- b. By an alternate statistical method meeting the requirements of §20415(e)(8)(E) of Title 27.

4. Monitoring Points

All monitoring wells established for the monitoring program must constitute the monitoring points for the groundwater Water Quality Protection Standard.

5. Point of Compliance

The point of compliance for the water standard at each Unit is a vertical surface located at the hydraulically downgradient limit of the Unit that extends through the uppermost aquifer underlying the Unit.

6. Compliance Period

The compliance period for the Wood Waste Landfill, unlined leachate basin, and Ash Disposal Area must be the number of years equal to the active life of the Wood Waste Landfill and ash disposal area plus the closure period. The compliance period is the minimum period during which the Discharger must conduct a water quality monitoring program subsequent to a release from any Unit. The compliance period must begin anew each time the Discharger initiates an evaluation monitoring program.

7. Background Monitoring Points

The Discharger must propose, for concurrence by the Regional Water Board, a background groundwater monitoring location and a background surface water monitoring location.

The historic surface water monitoring location, SW-1, is impacted by leachate with elevated concentrations of tannins and lignins, iron, and electrical conductivity from the

SIERRA PACIFIC INDUSTRIES INC.

CLEAN CLOSURE OF CLASS III WOOD WASTE LANDFILL, CLOSURE OF ASH DISPOSAL AREA, AND CLEANUP OF DIP TANK AREA
AMADOR COUNTY

open face of the Wood Waste Landfill. In addition, the historic background groundwater monitoring point at the facility, well B-1, is impacted by concentrations of organic constituents (e.g., total dioxins/furans, polynuclear aromatic hydrocarbons, and tannins & lignins).

The Discharger must submit a proposal for background monitoring wells **by December 12, 2008** for review by the Regional Water Board. The Discharger's proposal must include a technical evaluation that is based on laboratory analytical data (historic and current), hydrogeology, and engineering analysis. An electronic file (a .xls file) suitable for statistical analysis must be submitted that includes all historic and current data. In addition, tables with data, any formulas used for statistics, and photocopies of formulas and the supporting text for any source/reference used to develop a statistical analysis must be included. A map with all historic and current monitoring points must be included. The Discharger's "clean closed areas" must be defined and outlined on the map. Construction work being performed by Sierra Pacific Industries, its partners, subsidiaries, sister-companies, and otherwise owned or operated by the Discharger must be delineated and defined on the map. The Regional Water Board staff will review the Discharger's technical evaluation and will determine the suitability of any proposal.

E. REPORTING REQUIREMENTS

1. Record Maintenance

The Discharger must retain records of all monitoring information, including all calibration and maintenance records, all original strip chart recordings of continuous monitoring instrumentation, copies of all reports required by this Order, and records of all data used to complete the application for this Order. Records must be maintained throughout the life of the facility including the postclosure period. Such legible records must show the following for each sample:

- a. Sample identification number, the monitoring point or background monitoring point from which it was taken, and the identity of the individual who obtained the sample;
- b. Date, time, and manner of sampling;
- c. Date and time that analyses were started and completed, and the name of the personnel and laboratory performing each analysis;
- d. Complete procedure used, including method of preserving the sample, and the identity and volumes of reagents used;
- e. Calculation of results; and
- f. Results of analyses, and the MDL, PQL, and trace quantities for each analysis.

2. Transmittal Letter and Certification

A transmittal letter explaining the essential points must accompany each report. The transmittal letter must include the Order Nos. for the WDRs and MRP, and the date of the Standard Provisions. In addition, the transmittal letter must identify and discuss any violations found since the last report was submitted, and if the violations were corrected. The Discharger must reference any previously submitted time schedules for any corrective action, other enforcements, or evaluation monitoring. If no violations have occurred since the last submittal, this must be clearly stated in the transmittal letter. The transmittal letter must contain the penalty of perjury statement by the Discharger, or the Discharger's authorized agent, as described in the Standard Provisions, General Reporting Requirements. All reports and transmittal letters must be signed by persons identified below:

For a corporation: by a principal executive officer of at least the level of senior vice-president.

For a partnership or sole proprietorship: by a general partner or the proprietor.

A duly authorized representative of a person designated in a or b above if the authorization is made in writing by a person described in a or b of this provision; the authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, superintendent, or position of equivalent responsibility. A duly authorized representative may thus be either a named individual or any individual occupying a named position; and the written authorization is submitted to the Board.

3. Report Prepared Under Supervision of Registered Geologist or Civil Engineer

In accordance with California Business and Professions Code Sections 6735, 7835, and 7835.1, engineering and geologic evaluations and judgments must be performed by or under the direction of registered professionals competent and proficient in the fields pertinent to the required activities. All monitoring reports, sampling and analysis plans, and any other reports or plans must be prepared by or under the direction of appropriately qualified professional(s), even if not explicitly stated. Each monitoring report, other report, or plan submitted by the Discharger must contain the professional's signature and stamp of the seal.

4. Report of Seeps

The Discharger must report by telephone any seepage from any Unit **immediately** after it is discovered. A written report must be filed with the Regional Water Board **within seven days**, containing at least the following information:

- a. A map showing the location(s) of seepage;
- b. An estimate of the flow rate;
- c. A description of the nature of the discharge (e.g., all pertinent observations and analyses);

- d. Verification that samples have been submitted for analyses of the Constituents of Concern and Constituents of Concern listed in Table 5 of this MRP, and an estimated date that the results will be submitted to the Regional Water Board; and
- e. Corrective measures underway or proposed, and corresponding time schedule.

5. Reporting Schedule

The Discharger must submit reports with the data and information required in this MRP, the WDRs Order No. 98-094, and the Standard Provisions and Reporting Requirements (dated August 1997). Unless otherwise approved by the Regional Water Board, the results of any monitoring conducted at the site must be reported to the Regional Water Board in accordance with the reporting schedule below for the calendar period in which samples were taken or observations made, including any monitoring done more frequently than required by the MRP. The following table contains the due dates for submittal of reports:

Quarterly Monitoring Reports

<u>Report Type</u>	<u>Sampling Frequency</u>	<u>Reporting Period</u>	<u>Date Due</u>
Quarterly	Weekly/monthly/quarterly	1 January – 31 March	30 April
		1 April – 30 June	31 July
		1 July – 30 September	31 October
		1 October – 31 December	31 January

Other Reports

	<u>Date Due</u>
Annual Monitoring Summary Report	31 January of each year
Facility Monitoring Report	15 November of each year
Response to a Release	As necessary
Background Monitoring Well Proposal	12 December 2008
Sample Collection and Analysis Plan	1 April 2009
Water Quality Protection Standard	15 June 2009

6. Quarterly Monitoring Reports

Quarterly monitoring reports must include the following information:

- a. If the Discharger discusses any previous report, plan, or document in its Monitoring Reports, then the Discharger must fully disclose if the Regional Water Board rejected and/or did **NOT** concur with any such document, including but not limited to the technical evaluations, the conclusions, or the recommendations in any such report. Failure to disclose fully such relevant information is a violation of this MRP and the Standard Provisions.
- b. Surface water monitoring results must be reported in the quarterly reports. If no surface water was present during the quarter, then this information must be included in the report.
- c. The Discharger must determine and report the groundwater flow rate and

direction in the uppermost aquifer, in any zones of perched water, and in any additional zone of saturation monitored pursuant to this MRP. Results must be reported quarterly, including the times of highest and lowest elevations of the water levels in the wells.

- d. In reporting the monitoring data, the Discharger must arrange the data in tables so that the date, the constituents, the concentrations, units, and compliance are readily discernible. The data must be summarized in such a manner so as to illustrate clearly the compliance with the WDRs or lack thereof. All historical and current groundwater, leachate, seep, and surface water analytical results must be tabulated and submitted.
- e. Field and laboratory tests must be reported in each monitoring report. Weekly, monthly, quarterly, semiannual, and annual monitoring reports must be submitted in accordance with the schedule, below, for the calendar period in which samples were taken or observations made. Any analysis performed beyond the requirements of this monitoring and reporting program must be reported in the quarter for which the samples were obtained.
- f. A discussion of the monitoring results, including notations of any water quality violations must precede any tabular summaries.
- g. For the Wood Waste Landfill, each monitoring report must have a tabulated summary of the monthly quantity of wood waste hauled off site during the reporting period and the cumulative quantity since the start of clean closure.
- h. The Discharger must include a site map showing the facility features, existing and historical monitoring wells, direction of groundwater flow, and stormwater and surface water monitoring locations.
- i. The Discharger must include hard copies of all analytical reports as signed by the appropriate laboratory personnel.
- j. The Discharger must include the monitoring well data sheets, including the date and time, type of pump, purging and sampling method, and water disposal method.
- k. The Discharger must provide a description of the sampling procedure (number and description of the samples, field blanks, travel blanks, and duplicate samples taken, the type of containers and preservatives used, the date and time of sampling, the name, and any other observations).
- l. Each monitoring report must include a compliance evaluation summary. The summary must contain at least:
 - 1) Laboratory statements of results of all analyses evaluating compliance with requirements.
 - 2) A technical evaluation of the effectiveness of the leachate monitoring and control facilities.
 - 3) A technical evaluation of the effectiveness of the run-off/run-on control facilities.
 - 4) The quantity and types of wastes discharged into the Wood Waste Landfill, and the locations in the Wood Waste Landfill where waste has been placed since submittal of the last such report.

5) Tabulated data showing the monthly and total cumulative quantity and types of wastes extracted from the Wood Waste Landfill and Ash Disposal Area that have been transported off-site.

6) A **summary and certification of completion** of all **Standard Observations** for the Wood Waste Landfill and ash disposal area, for the perimeter of the Wood Waste Landfill and ash disposal area, and for the receiving waters. Standard observations must be conducted **weekly** during the wet season (1 October to 30 April) and **monthly** during the dry season (1 May to 30 September). The Standard Observations must include:

For the Wood Waste Landfill and ash disposal area:

- a) Evidence of ponded water at any point on the facility (show affected area on map);
- b) Evidence of odors - presence or absence, characterization, source, and distance of travel from source; and
- c) Evidence of erosion and/or of day-lighted refuse.

Along the perimeter of the Wood Waste Landfill and ash disposal area:

- a) Evidence of liquid leaving or entering the Wood Waste Landfill and ash disposal area, estimated size of affected area, estimated flow rate, and color of liquids (show affected area on map);
- b) Evidence of odors - presence or absence, characterization, source, and distance of travel from source; and
- c) Evidence of erosion and/or of day-lighted refuse.

For receiving waters:

- a) Floating and suspended materials of waste origin - presence or absence, source, and size of affected area;
- b) Discoloration and turbidity - description of color, source, and size of affected area;
- c) Evidence of odors - presence or absence, characterization, source, and distance of travel from source;
- d) Evidence of water uses - presence of water-associated wildlife;
- e) Flow rate; and
- f) Weather conditions - wind direction and estimated velocity, total precipitation during recent days and on the day of observation.

7) For each monitoring point and background monitoring point addressed by the report, a description of:

- a) The time of water level measurement;
- b) The type of pump - or other device - used for purging and the elevation of the pump intake relative to the elevation of the screened interval;
- c) The method of purging (the pumping rate; the equipment and methods used to monitor field pH, temperature, and conductivity during purging; the calibration of the field equipment; results of the

- pH, temperature, conductivity, and turbidity testing; and the method of disposing of the purge water) to remove of the water that was in the well bore while the sample was being taken;
- d) The type of pump - or other device - used for sampling, if different than the pump or device used for purging;
 - e) A statement that the sampling procedure was conducted in accordance with the approved SAP;
 - f) A discussion of upward trends in any constituent concentration; and
 - g) A discussion of violations
- k. For non-naturally occurring organic Constituents of Concern (e.g., tannins and lignins, VOCs, polynuclear aromatic hydrocarbons, total dioxins, chlorinated phenols, TPH, BTEX, and etc), the Discharger must conclude that a release is tentatively indicated if the data for any Monitoring Point contains either:
- a) Two or more qualifying constituents that equal or exceed their respective MDLs, or
 - b) One qualifying constituent which exceeds its PQL

Based on the above, if the Discharger determines that there is measurably significant evidence of a release from the Wood Waste Landfill and ash disposal area at any monitoring point, then the Discharger must **immediately** implement the requirements of **The Standard Provisions, Response To A Release**.

7. Annual Monitoring Report

The Discharger must submit an **Annual Monitoring Summary Report** to the Regional Water Board staff covering the reporting period of the previous monitoring year. This report must contain:

- a. All Constituents of Concern must be graphed so as to show historical trends at each monitoring point and background monitoring point for all historical samples. Each such graph must plot the concentration of one constituent for the period of record for a given monitoring point or background monitoring point, at a scale appropriate to show trends or variations in water quality. The graphs must plot each datum, rather than plotting mean values. For any given constituent or parameter, the scale for background plots must be the same as that used to plot downgradient data. Graphical analysis of monitoring data may be used to provide significant evidence of a release.
- b. All historical monitoring data, including all data for the previous year, must be submitted in tabular format and in a digital file format (e.g., an electronic file with an Excel spreadsheet) acceptable to the Regional Water Board. The Regional Water Board regards the submittal of data in hard copy and in digital format as "...the form necessary for..." statistical analysis [Title 27 CCR Section 20420(h)], in that this facilitates periodic review by the Regional Water Board. The electronic Excel spreadsheet must include the location identifier (e.g., well number or other monitoring point), results, units, MDLs,

SIERRA PACIFIC INDUSTRIES INC.

CLEAN CLOSURE OF CLASS III WOOD WASTE LANDFILL, CLOSURE OF ASH DISPOSAL AREA, AND CLEANUP OF DIP TANK AREA
AMADOR COUNTY

PQLs, trace concentrations, analyte, CAS number, analytical method number, sample date, and laboratory. The acceptable format is shown below:

Sample Location ID	Date Sampled	Analyte	Results	PQL	MDL	Qualifiers	Units
Example Location ID #1	Mm/dd/yy	Analyte 1	.004	.005	.0025	J	mg/L
Example Location ID #1	Mm/dd/yy	Analyte 2	ND	.005	.0025		mg/L
Example Location ID #1	Mm/dd/yy	Analyte 3	40	25	12		ug/L
Example Location ID #2	Mm/dd/yy	Analyte 1	.6	.005	.0025		mg/L
Example Location ID #2	Mm/dd/yy	Analyte 2	10	.005	.0025		mg/L
Example Location ID #3	Mm/dd/yy	Analyte 1	.6	.005	.0025		mg/L
Example Location ID #3	Mm/dd/yy	Analyte 3	26	25	12		ug/L

- c. A comprehensive evaluation and determination of the Discharger's compliance record, and the result of any corrective actions taken or planned which may be needed to bring the Discharger into full compliance with the waste discharge requirements.
- d. The groundwater flow rate and direction, including the times of highest and lowest elevations of the water levels in the wells.
- e. Hydrographs of each well must be submitted showing the elevation of groundwater with respect to the elevations of the top and bottom of the screened interval and the elevation of the pump intake. Hydrographs of each well must be prepared quarterly and submitted annually.
- f. The applicable Constituents of Concern must be evaluated with regards to the cation/anion balance, and the results must be graphically presented annually using a Stiff diagram, a Piper graph, or a Schueller plot. Plots of each well must be prepared quarterly and submitted annually.
- g. A map showing the area and elevations in which material has been filled during the previous calendar year, if any.
- h. A map showing the area and current elevation where extraction has been completed during the previous calendar year.
- i. Tabulated data showing the annual historical volume of material extracted and transported out of any waste management unit (i.e., the Wood Waste Landfill, Ash Disposal Area, and Leachate Basin) and off-site.
- j. Tabulated data for the current calendar year showing the monthly and cumulative total quantity of any extracted material that has been transported off-site.

SIERRA PACIFIC INDUSTRIES INC.

CLEAN CLOSURE OF CLASS III WOOD WASTE LANDFILL, CLOSURE OF ASH DISPOSAL AREA, AND CLEANUP OF DIP TANK AREA
AMADOR COUNTY

- k. A written summary of the monitoring results, indicating any changes made or observed since the previous annual report.
- l. An evaluation and determination of the effectiveness of the unlined leachate basin as it relates to the proximity to groundwater, the collection and storage of leachate with concentrations of constituents of concern, and the impact of the leachate to shallow groundwater.
- m. Annually beginning with the report due **31 January 2009**, the Discharger must list in tabular format all groundwater monitoring wells (both historical and existing), depth of boring, the horizontal survey coordinate, the vertical survey coordinate, the surveying reference datum (e.g., NAD 83, NVD 88, etc), the date installed, and the date decommissioned.
- n. The Discharger must include all information required to be reported by the Standard Provisions, this MRP, and the Waste Discharge Requirements.

Ordered by: _____
PAMELA C. CREEDON, Executive Officer

9 September 2008
(Date)

SIERRA PACIFIC INDUSTRIES INC.

CLEAN CLOSURE OF CLASS III WOOD WASTE LANDFILL, CLOSURE OF ASH DISPOSAL AREA, AND CLEANUP OF DIP TANK AREA
AMADOR COUNTY**TABLE 6 CONSTITUENTS OF CONCERN AND ANALYTICAL METHODS***

<u>Field Parameter</u>	<u>Method</u>
Electrical Conductivity	Calibrated field instrument
pH	Calibrated field instrument
Turbidity	Calibrated field instrument
Dissolved oxygen	Calibrated field instrument
<u>Monitoring Parameter</u>	<u>Method</u>
<u>Metals, total</u>	
Iron	EPA 6020
Manganese	EPA 6020
<u>General chemistry</u>	
Specific conductance	EPA 120.1
Tannins & Lignins	SM 5550B
Chemical Oxygen Demand	EPA 410.4
Biochemical Oxygen Demand	EPA 405.1
Total Dissolved Solids	EPA 160.1
Total Suspended Solids	EPA 160.2
<u>General minerals, total</u>	
Chloride	EPA 300
Sulfate	EPA 300
Carbonate	2320B
Bicarbonate	2320B
Calcium	EPA 6020
Magnesium	EPA 6020
Sodium	EPA 6020
Potassium	EPA 6020
<u>Chlorinated Phenols,</u>	<u>USEPA Method 8270C</u>
2,3,4,6-Tetrachlorophenol	
Pentachlorophenol	
2-Chlorophenol	
4-Chloro-3-methylphenol	
2,4-Dichlorophenol and 2,6-Dichlorophenol	
2,4,5-Trichlorophenol and 2,4,6-Trichlorophenol	
<u>Polynuclear Aromatic Hydrocarbons, Selective Ion Monitoring (SIMS) USEPA Method 8270C</u>	
Naphthalene	
Pyrene	
Acenaphthene	
Fluorene	
Phenanthrene	
Anthracene	
Fluoranthene	
Benzo(a)anthracene	
Chrysene	
Benzo(b)fluoranthene	
Benzo(k)fluoranthene	
Benzo(a)pyrene	
Indeno(1,2,3-c,d)pyrene	
Dibenzo(a,h)anthracene	
Benzo(g,h,i)perylene	

SIERRA PACIFIC INDUSTRIES INC.

CLEAN CLOSURE OF CLASS III WOOD WASTE LANDFILL, CLOSURE OF ASH DISPOSAL AREA, AND CLEANUP OF DIP TANK AREA
AMADOR COUNTY

TABLE 6 CONSTITUENTS OF CONCERN AND ANALYTICAL METHODS*

Tetra- through Octa-Chlorinated Dibenzodioxins and Dibenzofurans (dioxins/furans), USEPA Method 1613B, Total Concentrations

- 2,3,7,8-TCDD
- Total TCDD
- 2,3,7,8-TCDF
- Total-TCDF
- 1,2,3,7,8-PeCDD
- Total-PeCDD
- 1,2,3,7,8-PeCDF
- 2,3,4,7,8-PeCDF
- Total-PeCDF
- 1,2,3,4,7,8-HxCDD
- 1,2,3,6,7,8-HxCDD
- 1,2,3,7,8,9-HxCDD
- Total-HxCDD
- 1,2,3,4,7,8-HxCDF
- 1,2,3,6,7,8-HxCDF
- 1,2,3,7,8,9-HxCDF
- 2,3,4,6,7,8-HxCDF
- Total-HxCDF
- 1,2,3,4,6,7,8-HpCDD
- Total-HpCDD
- 1,2,3,4,6,7,8-HpCDF
- 1,2,3,4,7,8,9-HpCDF
- Total-HpCDF
- OCDD
- OCDF

Acronyms:

TCDD = Tetrachlorodibenzo-*p*-dioxin; TCDF = Tetrachlorodibenzofuran; PeCDD = Pentachlorodibenzo-*p*-dioxin; PeCDF = Pentachlorodibenzofuran; HxCDD = Hexachlorodibenzo-*p*-dioxin; HxCDF = Hexachlorodibenzofuran; HpCDD = Heptachlorodibenzo-*p*-dioxin; HpCDF = Heptachlorodibenzofuran; OCDD = Octachlorodibenzo-*p*-dioxin OCDF = Octachlorodibenzofuran

* Constituents of Concern must be prepared and analyzed for "total" concentrations unless otherwise approved by the Regional Water Board.

Requirements For Monitoring Well Work Plans, Sample Collection and Analysis Plans, and Reports

Prior to installation of any monitoring well (including groundwater and/or landfill gas), the Discharger shall submit a monitoring well workplan (MWP) and Sample Collection and Analysis plan (SAP) that will contain, at a minimum, the information listed in Sections I and II, below. The MWP and SAP shall be submitted as one document. Wells may be installed after Regional Water Board staff concurs with the MWP and SAP.

In addition, any SAP prepared for the Discharger's facility will contain, at a minimum, the information in Sections II.

Any sampling reports shall contain, at a minimum, the information required by Section III of this *Requirements for Monitoring Well Workplan, Sample Collection and Analysis Plan and Report Requirements*.

Unless stipulated otherwise by Regional Water Board staff, **60-days after installation of any monitoring well**, the Discharger shall submit a well installation and analytical report (Report). The Report shall include but not be limited to the information contained in Sections III, below. The MWP, SAP, and Report must be prepared under the direction of, and signed by, a registered geologist or civil engineer licensed by the State of California. In addition, any other analytical report prepared for the Discharger's facility shall also contain, at a minimum, the information in Sections III. Any plan or report submitted must include the Discharger's transmittal letter and certification statement.

SECTION I — Monitoring Well Installation Workplan

A. General Information:

1. Purpose of well installation and sampling/analysis project, including determination of vertical and horizontal extent of groundwater contamination
2. Site location map
3. Copies of County Well Construction Permits (to be submitted after workplan review)
4. New monitoring well locations and rationale
5. Equipment decontamination procedures
6. Health and safety plan
7. Topographic map showing any existing wells, proposed wells, waste handling facilities, utilities, and other major physical and man-made features.

B. Drilling Details:

**Requirements for
Monitoring Well Work Plans, Sample Collection and Analysis Plans, and Reports**

1. Drill rig and contractor
 2. Sampling intervals and logging methods.
 3. Procedures if "refusal" is encountered.
 4. Procedures if well appears to be dry.
- C. Monitoring Well Design–Graphic and Descriptive:
1. Casing diameter and centralizer spacing (if needed)
 2. Borehole diameter
 3. Depth of surface seal
 4. Well construction materials
 5. Diagram of proposed well construction details
 6. Type of well cap, bottom cap either screw on or secured with stainless steel screws
 7. Size of perforations and rationale
 8. Grain size of sand pack and rationale
 9. Thickness and position of bentonite seal and sand pack
 10. Depth of well, length and position of perforated interval.
- D. Well Development:
1. Method of development
 2. Method of determining when development is complete
 3. Parameters to be monitored during development
 4. Development water storage and disposal.
- E. Well Survey Coordinates, horizontal and vertical:
1. Name of the Licensed Land Surveyor or Registered Civil Engineer
 2. Well features to be surveyed (i.e. top of casing, horizontal and vertical coordinates)
 3. Horizontal and vertical accuracy (vertical shall be at least 0.01-foot).
 4. Survey data used (e.g., NAD 83, NVD 88, etc)
- F. Water Level Measurement:
1. The elevation reference point at each monitoring well shall be within 0.01-foot
 2. Ground surface elevation at each monitoring well shall be within 0.01-foot
 3. Method and time of water level measurement shall be specified.
- G. Detailed time-schedule, with dates (day, month year), for office, field, and analytical work.

SECTION II – Sample Collection and Analysis Plan

To prevent errors in the field and laboratory, any Sample Collection and Analysis Plan must contain step-wise procedures in bullet or numbered format with supporting tables. Supporting text must precede the step-wise procedures in bullets/numbers and the tables. All Sample Collection and Analysis Plans shall include but not be limited to the following information:

- A. Table of Contents
- B. General Information, Purpose, and Scope of the Plan
- C. Include the requirements of when and how to notify the Regional Water Quality Control Board staff regarding results of analysis. Include phone, certified mail, and resample results notification time lines, procedures, and requirements.
- D. Sampling and Analysis Technical Information
 1. Map showing all sampling locations, including surface, storm, and groundwater monitoring locations. Locations must be identified by the sample location identification number.
 2. Tables with a list of all individual analytes by EPA Test Method, the reporting limit, and method detection limit for each individual analyte
 3. Table with sample identification numbers (including field duplicates, trip blanks, and MS/MSD) and the list of test methods to be performed for each sample identification number.
 4. Table with analytical methods, volumes, containers, preservatives, special field methods (such as field-filtering), preservation methods, practical quantitation limits, method detection limits, and hold times.
 5. Identification of analytical laboratory and California DHS certification number.
 6. Chain of custody (COC) procedures and sample COC.
 7. Field instrument make/model and calibration procedures.
 8. Field procedures in sequential numbered order.
- E. QA/QC procedures for field and laboratory analysis
- F. List the Analytical Laboratory Reporting Requirements, as defined below:
 1. The **methods of analysis and the detection limits** used must be appropriate for the expected concentrations. The analytical method having the lowest method detection limit (MDL) shall be selected from among those methods which would provide valid results in light of any matrix effects or interferences.
 2. **“Trace” results**, results falling between the MDL and the practical quantitation limit (PQL), shall be reported as such, and shall be accompanied by both the estimated MDL value and PQL value for that analytical run.
 3. **MDLs and PQLs** shall be derived by the laboratory for each analytical procedure, according to State of California laboratory accreditation procedures. These MDLs and PQLs shall reflect the detection and quantitation capabilities of the specific analytical procedure and equipment used by the lab, rather than

**Requirements for
Monitoring Well Work Plans, Sample Collection and Analysis Plans, and Reports**

4. If the laboratory suspects that, due to a change in matrix or other effects, the true detection limit or quantitation limit for a particular analytical run differs significantly from the laboratory-derived MDL/PQL values, the results shall be flagged accordingly, along with estimates of the detection limit and quantitation limit actually achieved. The **MDL shall always be calculated such that it represents the lowest achievable concentration associated with a 99% reliability of a nonzero result.** The PQL shall always be calculated such that it represents the lowest constituent concentration at which a numerical value can be assigned with reasonable certainty that it represents the constituent's actual concentration in the sample. Normally, PQLs should be set equal to the concentration of the lowest standard used to calibrate the analytical procedure.
5. All **QA/QC data** shall be reported, along with the sample results to which they apply, including the method, equipment, analytical detection and quantitation limits, the percent recovery, an explanation for any recovery that falls outside the QC limits, the results of equipment and method blanks, the results of spiked and surrogate samples, the frequency of quality control analysis, and the name and qualifications of the person(s) performing the analyses. Sample results shall be reported unadjusted for blank results or spike recoveries. In cases where contaminants are detected in QA/QC samples (i.e., field, trip, or lab blanks), the accompanying sample results shall be appropriately flagged.
6. Unknown chromatographic peaks shall be reported, flagged, and tracked for potential comparison to subsequent unknown peaks that may be observed in future sampling events. Identification of unknown chromatographic peaks that recur in subsequent sampling events may be required.
7. The statistical method shall account for data below the practical quantitation limit (PQL) with one or more statistical procedures that are protective of human health and the environment. Any PQL validated pursuant to Title 27 CCR §20415(e)(7) that is used in the statistical method shall be **the lowest concentration (or value) that can be reliably achieved** within limits of precision and accuracy specified in the waste discharge requirements (WDRs) for routine laboratory operating conditions that are available to the facility. The Discharger's technical report, pursuant to Title 27 CCR §20415(e)(7), shall consider the PQLs listed in Appendix IX to Chapter 14 of Division 4.5 of Title 22 CCR, for guidance when specifying limits of precision and accuracy. For any given constituent monitored at a background or downgradient monitoring point, an indication that falls between the MDL and the PQL for that constituent (hereinafter called a "trace" detection) shall be identified and used in appropriate statistical or nonstatistical tests. Nevertheless, for a statistical method that is

**Requirements for
Monitoring Well Work Plans, Sample Collection and Analysis Plans, and Reports**

compatible with the proportion of censored data (trace and ND indications) in the data set, the Discharger can use the laboratory's concentration estimates in the trace range (if available) for statistical analysis, in order to increase the statistical power by decreasing the number of "ties".

8. All chains-of-custody shall be signed as received by the laboratory.
 9. All laboratory reports shall be signed by an authorized representative of the laboratory.
- G. Constituents of Concern
1. Provide a table with the Constituents of Concern
- H. Groundwater Well Sampling
9. Minimum time after development before sampling (48 hours)
 10. Well purging method and purge water volume, storage, and disposal
 11. Equipment decontamination procedures
 12. Field equipment decontamination procedures
- E. Proposed analytical laboratory
- F. Proposed Dated Time-Schedule for Sampling and Analytical Reports
1. Provide a time-schedule with dates that at a minimum shows fieldwork, laboratory analysis, and report preparation.
- G. Required Analytical Parameters and Test Methods

SECTION III - Monitoring Well Installation and Analytical Report

A. Well Construction Details—Graphical, Tabular, and Descriptive:

1. Quantity and depth of wells drilled
2. Date(s) wells drilled and completed
3. Description of drilling and construction
4. Updated comprehensive site map with facility site features including monitoring wells, sample locations and identification numbers, storage ponds, landfills, investigation areas, groundwater gradient and iso-contour lines, buildings, tanks, and etc.
5. Tabular summary of well construction details for all installed wells:
 - a. Monitoring well number
 - b. Date installed
 - c. Horizontal and vertical survey coordinates
 - d. Depth of open hole
 - e. Type of cap
 - f. Slot size, length, and depth to top and bottom of slotted casing
 - g. Depth of bottom of casing
 - h. Depth to top of sand pack
 - i. Thickness of sand pack
 - j. Depth to top of bentonite seal
 - k. Thickness of bentonite seal
 - l. Thickness of concrete grout
 - m. Boring diameter
 - n. Casing diameter
 - o. Casing material
 - p. Size of perforations
 - q. Well elevation at top of casing
 - r. Stabilized depth to groundwater
6. Graphical presentation of well construction for each well with the following details:
 - a. Well number, date started, date completed, geologist's name
 - b. Total depth drilled
 - c. Drilling Contractor and driller name and address
 - d. Depth of open hole (same as total depth drilled if no casing occurs)
 - e. Method and materials of grouting excess borehole
 - f. Footage of hole collapsed
 - g. Length of slotted casing installed
 - h. Depth of bottom of casing
 - i. Depth to top of sand pack
 - j. Thickness of sand pack
 - k. Depth to top of bentonite seal
 - l. Thickness of bentonite seal

**Requirements for
Monitoring Well Work Plans, Sample Collection and Analysis Plans, and Reports**

- m. Thickness of concrete grout
 - n. Boring diameter
 - o. Casing diameter
 - p. Casing material
 - q. Size of perforations
 - r. Well elevation at top of casing
 - s. Stabilized depth to groundwater
 - t. Date of water level measurement
 - u. Monitoring well number
 - v. Date drilled
 - w. Location
- B. Well Development:
- 1. Date(s) of development of each well
 - 2. Method of development
 - 3. Volume of water purged from well
 - 4. How well development completion was determined
 - 5. Method of effluent disposal
 - 6. Field notes from well development should be included in report.
- C. Well Survey
- 1. Coordinate system, epochs, bench marks, horizontal controls, accuracy, and precision
 - 2. Survey results of casing elevation with the cap removed (vertical to 1/100th foot)
 - 3. California Registered Civil Engineer or Licensed Surveyor's report, field notes, and stamp/signature in an appendix
 - 4. Description of the measuring points (i.e. ground surface, top of casing, etc.)
 - 5. Tabulated survey data with well numbers and horizontal and vertical coordinates.
- D. Groundwater Field Sampling
- 1. Tabulated groundwater elevations and wells
 - 2. Graphical presentation of groundwater gradient and iso-contour lines.
 - 3. Graphical presentation of groundwater iso-concentration lines
 - 4. Tabulated field and analytical data with sample location identification numbers, water quality goals, field/analytical results, and highlighted data that is outside water quality goals
- E. Laboratory Analytical Results

All analytical reports prepared for the Discharger's facility shall contain, at a minimum, the information within this section.

**Requirements for
Monitoring Well Work Plans, Sample Collection and Analysis Plans, and Reports**

1. Tabulated field and analytical data with sample location identification numbers, water quality goals, field/analytical results, and highlighted data that is outside water quality goals
2. Appendix with laboratory reports, COCs, and laboratory signatures on reports.
3. Laboratory reports showing results, reporting units, MDLs, PQLs, "trace" results, flagged results, matrix effects, and QA/QC results.
4. Site map(s) showing iso-concentration lines for Constituents of Concern
5. Piper Diagrams and Stiff Plots comparing upgradient and downgradient water quality parameters.
6. Discussion of results including, but not limited to, discussion of violations, exceedances, if all field and monitoring parameters were sampled and analyzed, description of groundwater flow direction, comparison of analysis and field sampling results to background and water quality goals, list of potential constituents of concern at each sampling location, and other relevant discussions.
7. Certification statement signed by an authorized representative.
8. Report stamped by California Licensed engineer or geologist.
9. Summary and Conclusions
 - a Description and delineation of vertical and horizontal extent of contamination
 - b Compare analytical results to approved water quality goals
 - c Identify suspected sources of contamination
 - d Recommend additional investigative needs based on data gaps and interim remedial measures.