

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2008- XXXX  
CALIFORNIA WATER CODE SECTION 13267

FOR

FORMER BALTIMORE AIRCOIL COMPANY FACILITY, INC., FACILITY  
TRACK FOUR, INC.,  
A WHOLLY OWNED SUBSIDIARY OF AMSTED INDUSTRIES INC.,  
AND  
A FORMER OWNER, MERCK & CO., INC.,  
GROUNDWATER REMEDIATION  
MERCED COUNTY

This monitoring and reporting program (MRP) is issued by the Executive Officer of the California Regional Water Quality Control Board, Central Valley Region (Regional Water Board) pursuant to California Water Code Section 13267. Former facility owners Track Four, Inc., and Merck & Co., Inc., (hereafter collectively referred to as the Discharger) are required to comply with this MRP, which contains the minimum monitoring and reporting requirements necessary to determine compliance with Waste Discharge Requirements Order No. R5-2008-XXXX. The Discharger shall not implement any changes to this MRP unless and until a revised MRP is approved in writing by Executive Officer of the Regional Water Board.

The following MRP is designed to determine the effectiveness of the full-scale in situ groundwater remediation effort at the former Baltimore Aircoil Company (BAC) facility, the fieldwork for which is scheduled to commence in early 2008. The facility has a groundwater extraction and treatment system that has been operating since 1994. A separate MRP, Order No. R5-2007-0830, specifies comprehensive long-term facility monitoring that goes beyond the scope of the subject MRP.

Prior to construction of any new groundwater monitoring or extraction wells, the Discharger shall submit plans and specifications to the Regional Water Board for review and approval. Once installed, all new wells shall be added to the monitoring program and shall be sampled and analyzed according to the schedule provided herein.

All monitoring wells shall be purged using micro-purging methodology with the use of dedicated bladder pumps in all monitoring wells, as necessary. This approach will increase consistency in sample collection, and produce analytical results that are more representative of actual groundwater conditions. Selected parameters including pH, conductivity, turbidity, and temperature of the pump discharge water shall be monitored during micro-purging until they have stabilized. Solid and liquid wastes, principally water resulting from equipment decontamination, well development, formation water generated during drilling, and purge or sampling water, shall be collected and disposed of pursuant to applicable requirements.

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

## **I. GROUNDWATER MONITORING UPON INITIATION OF FULL-SCALE IN SITU TREATMENT REMEDY**

The Discharger has proposed full-scale in situ groundwater treatment to achieve site-specific groundwater cleanup goals in a shorter time frame than that projected under the current groundwater extraction and treatment program. The full-scale in situ treatment remedy includes injecting chemical amendments into groundwater within the chromium plume associated with the former BAC facility. The Order for this MRP provides Regional Water Board approval for the full-scale in situ treatment remedy. Groundwater monitoring associated with this remedy is specified below.

### **A. Groundwater Monitoring for Full-Scale In situ Treatment - Wells and Sampling Schedule**

The currently existing monitoring network will primarily be used for monitoring the progress of the full-scale in situ groundwater treatment. However, two new wells will be installed at the former BAC facility to augment the existing well network. The approximate locations of these new wells are shown in Attachment B of the Order for this MRP.

The following wells shall be monitored semiannually beginning when amendment injection commences and continuing until Order No. R5-2008-XXXX is rescinded: OW-1, EW-5, MW-8, MW-9, MW-12, MW-26, MW-27, MW-29, MW-30, MW-41, MW-42, MW-43, MW-49, MW-50, MW-51, MW-54, MW-55, MW-56, MW-58, MW-60, MW-61, MW-62, MW-63, MW-64, MW-65, MW-66, MW-67, MW-68, and MW-69.

### **B. Groundwater Monitoring for Full-Scale In situ Treatment - Laboratory and Field Analysis**

All groundwater samples shall be grab samples. Samples from the wells used for groundwater monitoring during full-scale in situ treatment shall be analyzed pursuant to the following table:

<b>Parameter<sup>1</sup></b>	<b>Method<sup>2</sup></b>	<b>Unit</b>	<b>Maximum Detection Limit<sup>3</sup></b>
Hexavalent Chromium	EPA 7199	ug/l	0.2 ug/l
Total Chromium	EPA 200.8	ug/l	3 ug/l
Arsenic	EPA 200.8	ug/l	2 ug/l

<b>Parameter<sup>1</sup> (cont.)</b>	<b>Method<sup>2</sup></b>	<b>Unit</b>	<b>Maximum Detection Limit<sup>3</sup></b>
Iron <sup>4</sup>	EPA 200.8	ug/l	5 ug/l
Manganese	EPA 200.8	ug/l	2 ug/l
Nitrate	EPA 300.0	ug/l	0.5 mg/l
Sulfate <sup>4</sup>	EPA 300.0	ug/l	1 mg/l
Total Dissolved Solids <sup>4</sup>	EPA 160.1	mg/l	10 mg/l
Total Organic Carbon	EPA 415.1	mg/l	2 mg/l
Dissolved Oxygen	Field Meter	mg/l	--
Electrical Conductivity	Field Meter	umhos/cm	--
Oxidation/Reduction Potential	Field Meter	millivolts	--
'pH	Field Meter	pH units	--
Water Level	Field Meter	ft MSL	--

<sup>1</sup> Some of these parameters are also required under Order No. R5-2007-0830; they also appear here to ensure inclusion of results in the reports required by the subject MRP.

<sup>2</sup> If necessary, equivalent analytical methods may be used. The Discharger shall provide written justification.

<sup>3</sup> For non-detectable results

<sup>4</sup> Sample collection and analysis for these parameters are only required if ferrous sulfate is used as an amendment.

## II. AMENDMENT DISCHARGE MONITORING

The Discharger shall monitor daily the discharge of water and amendments that are injected into the groundwater. This monitoring shall include, at a minimum, recording of injected water and amendment volumes in gallons per day, and monitoring of amendment(s) added and biocides added (if any) in kilograms per day. Each amendment addition shall be recorded individually, along with information regarding the time over which the amendment was injected into the aquifer.

## III. AMENDMENT ANALYSIS

Prior to use, amendments shall be analyzed for the following parameters:

<b>Parameter</b>	<b>Method<sup>1</sup></b>	<b>Maximum Detection Limit (ug/l)</b>
Volatile Organic Compounds	EPA 8020 or 8260B	0.5
Semi-volatile Organic Compounds	EPA 8270	5.0
General Minerals <sup>2</sup>	Various	Various
Metals, Total & Dissolved <sup>3</sup>	EPA 200.7, 200.8	Various
Total Dissolved Solids	EPA 160.1	10,000
pH	Field Meter	NA
Electrical Conductivity	Field Meter	NA

<sup>1</sup> Or an equivalent EPA method that achieves the maximum detection limit;

<sup>2</sup> Alkalinity, bicarbonate, potassium, chloride, sulfate, total hardness, nitrate, nitrite, and ammonia;

<sup>3</sup> Metals include arsenic, barium, cadmium, calcium, total chromium, copper, iron, lead, manganese, magnesium, mercury, molybdenum, nickel, selenium and silica.

The analysis shall be done on the pure amendment and on the mixture of the amendment and municipal supply or groundwater at the estimated concentration that will be injected during the full-scale in situ treatment.

#### **IV. QUALITY ASSURANCE/QUALITY CONTROL**

Quality assurance/quality control (QA/QC) shall be performed to ensure precision and accuracy for groundwater sampling activities. Minimum QA/QC requirements are as follows:

##### **A. Duplicate Samples**

One duplicate groundwater sample shall be collected for every ten groundwater samples collected during each groundwater monitoring event.

##### **B. Chain-of-Custody Forms**

Completed chain-of-custody forms shall be provided with the final laboratory reports.

##### **C. Field Meters**

Field testing instruments shall be used by an operator trained in proper use and maintenance of the instruments. All field instruments shall be calibrated prior to each monitoring event. In addition, field parameter instruments shall be serviced or calibrated by the manufacturer at the recommended frequency. Field calibration reports shall be included in the semiannual groundwater monitoring reports.

#### **V. ESTABLISHMENT OF BACKGROUND CONCENTRATION VALUES**

Pursuant to Finding 13 of the Waste Discharge Requirements for this MRP, the Discharger shall develop background values for concentrations of dissolved oxygen, oxidation-reduction potential,

iron, manganese, nitrate, sulfate, and total organic carbon in groundwater following the procedures found in the California Code of Regulations Section 20415(e)(10). The Discharger shall submit a proposal to develop the background concentrations by **16 May 2008**.

## **VI. REPORTING**

In reporting monitoring data, the Discharger shall arrange the data in tabular form so that the date, sample type (e.g., influent, effluent, groundwater, etc.), and reported analytical result for each sample are readily discernible. The data shall be summarized in such a manner to clearly illustrate compliance with waste discharge requirements and spatial or temporal trends, as applicable. The results of any monitoring done more frequently than required at the locations specified in the Monitoring and Reporting Program shall also be reported to the Regional Water Board.

As required by the California Business and Professions Code Sections 6735, 7835, and 7835.1, all Reports shall be prepared under the direct supervision of a Registered Engineer or Geologist and signed by the registered professional.

**Semiannual reports** shall be submitted to the Regional Water Board by the Discharger to assess long-term effects of injected amendments on aquifer geochemistry until such time as the Executive Officer determines that the reports are no longer necessary. Semiannual monitoring shall be conducted in the second and fourth quarters of the calendar year, with monitoring reports due to the Regional Water Board by **1 August** and **1 February**. Each semiannual report shall include the following minimum information:

1. Depths-to-water measurements and corresponding groundwater elevations for all monitoring wells and extraction wells, extraction rates and total volume extracted from each active extraction well, and groundwater analytical results for all wells sampled. This data shall be presented in tabular format;
2. Copies of all final laboratory analytical reports, including QA/QC (electronic copies are encouraged and preferred);
3. Field logs containing, at a minimum, water quality parameters measured before, during, and after well purging, method of purging, depth of water, volume of water purged, etc.;
4. A calibration log verifying calibration of any field monitoring instrument (e.g., pH, temperature, electrical conductivity, and turbidity meters) used to measure parameters during well purging;
5. Groundwater elevation contour maps for all groundwater zones, including estimated direction flow;
6. Calculated hydraulic gradients and estimated average linear velocities for all groundwater zones;

7. Isoconcentration maps for total dissolved chromium for the shallow aquifer;
8. Water level and water quality hydrographs showing historical data for each well; and
9. Any proposed changes in the extraction well network with justification for the change.
10. If applicable, the reasons for and duration of all interruptions in the operation of any remediation system, and actions planned or taken to correct and prevent interruptions.
11. A comparison of water quality results for the compliance wells designated in Finding 13 with background concentrations established for the former BAC facility, including a discussion of compliance with Groundwater Limitation C.2 of the Order for this MRP.

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 (if applicable), 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 results of any monitoring done more frequently than required at the locations specified in the MRP also shall be reported to the Regional Water Board. The Discharger shall implement the above monitoring program as of the date of the Order.

Ordered by:

---

PAMELA C. CREEDON, Executive Officer

---

Date