

Butte County
Air Quality Management District
2525 Dominic Drive, Suite J Chico, CA 95928
Telephone: (530) 891-2882 Fax: (530) 891-2878

SOIL VAPOR EXTRACTION/AIR STRIPPING SYSTEMS

**AUTHORITY TO CONSTRUCT/PERMIT TO OPERATE
REQUIREMENTS AND APPLICATION INSTRUCTIONS**

I. SAMPLING AND MONITORING REQUIREMENTS

- A. A soil vapor extraction or air stripping system shall be allowed to operate for a maximum of four calendar days, from system start up to perform system shakedown. This is done to establish the process parameters of the equipment, and to complete a compliance source test.

- B. The duration of the compliance source test shall be a minimum of two hours. During the two hour test, the process parameters listed in Section II.E. shall be recorded every half hour. Vapor stream sampling and total hydrocarbon (Total HC) monitoring shall be accomplished at a minimum of once per hour. The inlet and outlet vapor samples for any given hour shall be taken within 15 minutes of each other.

- C. The Butte County Air Quality Management District (AQMD) minimum sampling and monitoring requirements for the verification of total petroleum hydrocarbons (TPHg), and benzene emission rates are as follows:
 - 1. During the first month of operation there shall be at least one (1) source test conducted at the end of start-up period. The source test must include a means to verify the collection/destruction efficiency of the emissions control device, taking into consideration the inlet and outlet temperatures and volume flow rates, as well as vapor concentrations of benzene (or other air toxics), and TPHg.

 - 2. During the first month of operation, inlet and outlet vapor samples for benzene and TPHg shall be obtained according to the compliance source test protocol described in Section II.H.

 - 3. After the first month of operation, and upon AQMD approval, the minimum monitoring requirement shall be at least once per month for Total HC. Also, total HC shall be monitored after each shutdown/start-up cycle. The AQMD may require vapor sampling and laboratory analysis for benzene and TPHg, in addition to field monitoring for Total HC.

 - 4. Upon AQMD approval, the minimum monitoring device for Total HC

monitoring shall be equivalent to a photo-ionization detector, or a flame-ionization detector calibrated to hexane.

5. During all vapor monitoring, sampling, and analysis dates, the inlet and outlet volume flow rates and temperatures must be measured and documented.
6. In the case of carbon adsorption as a control device, Total HC monitoring may require a more frequent schedule than once per month in order to prevent an exceedance of emission limits due to carbon breakthrough.

II. APPLICATION INFORMATION REQUIRED

- A. Soil/groundwater sampling and analysis data. Include a summary of soil boring or groundwater sampling data in table form indicating analysis results in units of ppm for TPHg and benzene, or any other pollutants of concern.
- B. Estimate of total mass of TPHg and benzene, or other air toxics in the soil, or the extent of groundwater contamination.
- C. Estimated duration of operation, including beginning and ending dates.
- D. Dimensioned site map, indicating receptors within a radius of 500 feet. Also, the receptors immediately adjacent to the site location and their distances from the emission exhaust stack.
- E. Emission source parameters.
 1. Exhaust stack height. Note: Exhaust stack height should be at least 15 feet above ground, or higher, depending on the height of all adjacent buildings.
 2. Stack diameter.
 3. Stack volume flow rate (scfm).
 4. Well head vapor flow rate or extraction rate in scfm.
 5. Actual stack velocity.
 6. Stack gas temperature (degrees F).
 7. A copy of the remediation plan required by the Department of Water Resources should be included in the application.
 8. Estimated emission rates for TPHg and benzene, lb/day. Show all calculations used to estimate emissions.

- F. Diagram, description, and manufacturer's specifications of the extraction system and the emission control system. Include horsepowers of all electric or internal combustion motors, type of fuel used for all fuel burning equipment, maximum heat capacity (BTU/HR), maximum air and water flow rate capacity of all equipment, etc.
- G. A pilot test is recommended to be conducted, for vapor extraction systems with temporary portable equipment, in order to determine estimated emission rates for TPHg and benzene and any other designated pollutants of concern. A pilot test plan should be submitted to the AQMD two weeks prior to the test date, and consist of the following elements.

1. Duration of test.
2. Sampling and analytical plan.
3. Proposed emission control device for the duration of the pilot test.

Note: A permit is generally not required for a pilot test lasting up to five days in duration.

- H. An initial compliance source test and an inspection of the equipment is required. Submittal of a compliance source test plan 30 days prior to the scheduled source test is required for AQMD review and approval.

The following information must be contained in the compliance source test plan:

1. Total HC analysis with field monitoring equipment shall be proposed for inlet and outlet vapor stream monitoring. Total HC monitoring shall be done at approximately the same time that the vapor samples are taken. Additional test requirements may be specified for emissions of other toxic air contaminants.
2. Inlet and outlet vapor sampling with state certified laboratory analysis shall be accomplished in order to verify compliance with AQMD Rule 201 (Nuisance) for benzene and Rule 430 (New Source Review), including Best Available Control Technology (BACT) and reactive organic compounds (ROG), or TPH as gasoline or diesel. Toxics Best Available Control Technology (TBACT) may also be required.
3. Method for measuring and calculating the inlet and outlet stack volume flow rates and temperatures. The volume flow rate must be measured close to or at the same sampling ports used in obtaining the vapor samples (CARB Method 1 or 2A is preferred).
4. Sampling and analysis equipment, procedures and methods including state certified laboratory to be used, description and diagram of sampling equipment, and sample port locations.

5. Equipment used to verify, on a continuous basis, the incinerator combustion chamber temperature, as well as the inlet and exhaust stack temperatures (if applicable).
 6. The minimum frequency requirement for vapor sampling and measuring process parameters shall be followed according to Section I.A. Acceptable test equipment, as well as sampling and analysis methods, are contained in Tables 1 and 2.
- I. After completion of the compliance source test, the applicant shall prepare and submit a written emission source test report documenting the results of the system sampling and analysis. This report must be received no later than 30 calendar days after the source test date, and shall include the following minimum information:
1. The report shall include an as-built process flow diagram, which includes all sampling locations (with the initial source test only).
 2. The report shall contain the analysis results summarized in table format, which shall include the date, time, operating parameters recorded every 30 minutes, and inlet/outlet sample analysis data every hour for two hours minimum. Analysis reports sent from the laboratory shall be included in an attachment.
 3. Calculations for emission rates in units of lbs/day, inlet feed rates in units of lbs/day, volume flow rates of the inlet and exhaust stack in scfm, and the destruction/control efficiencies for benzene and TPHg shall be submitted (or other air contaminants specified).
 4. The report shall include any additional information which describes any modifications to the system design, adjustments of the preliminary operating parameters (i.e., temperature, flow rates, etc.), and any other revisions.

TABLE 1

PARAMETERS AND ACCEPTABLE TEST EQUIPMENT

PARAMETERS	EQUIPMENT	CALIBRATION*
Temperature	Thermometer Thermocouple	Calibrated against a known NBS traceable standard. Calibrated within six months prior to the test.
Pressure	Magnahelics, Std. Pressure Gages	Calibrated against a Standard Pressure barometer or pressure device that is NBS certified. Calibrated within six months prior to the test.
Gas Flow	Averaging Pilot Tube, Orifice Meter, Turbine Flowmeter, Hot Wire Anemometer	Must be calibrated as per manufacturer's recommendations. Proof of calibration must be reviewed and approved by the AQMD.
Fluid Flow	Rotameter or other equivalent device.	Must be calibrated as per manufacturer's recommendations. Proof of calibration must be reviewed and approved by the AQMD.

* Manufacturer's calibration of instrumentation is acceptable if date of certification, accuracy, and length of certification are certified by the manufacturer.

TABLE 2

SAMPLING AND ANALYTICAL METHODS

TARGET ANALYTE	SAMPLING METHOD¹	PREFERRED² ANALYTICAL METHOD	ALTERNATIVE ANALYTICAL METHOD
BENZENE	CARB 410A/B (TEDLAR BAG)	EPA 8010 (GC, MS)	CARB 410A/B (GC W/PID & FID)
TOTAL HC	FIELD MONITORING INSTRUMENT	PID/FID (CALIBRATED W/HEXANE)	
TPHg	CARB 410A/B (TEDLAR BAG)	EPA 8015 (GC W/FID)	

NOTE: Due to the physical properties of the collection vessels, gases sampled for collection by these methods should be no higher than 300°F. Samples from exhaust streams of catalytic or thermal incinerators must be cooled prior to collection. The cooling method must be of a non-contacting nature, such as setting impingers into an ice bath.

¹ QA/QC procedures within each method must be followed.

² District approval must be obtained for any other sampling or analytical method proposed.

- J. Periodic sampling and monitoring plan. The minimum requirements are listed in Section I.C. Quarterly sampling, monitoring and emission reports are also required by the AQMD and they must be composed in the same format as required in Sections II.I.2., 3. and 4. These reports are typically provided in the quarterly monitoring reports required by the lead agency.
- K. Details of the soil processing unit and the emission control system can be included in the same permit application. The application should be submitted in the name of the property owner/tenant and shall be submitted along with the supporting documents.
- L. Application fees are assessed after the final inspection and based on AQMD fee schedules in Regulation V.
- M. In order to expedite the proposed evaluation process, number the sections of the application to correspond to the numbering of the sections in these application instructions.
- N. A Permit to Operate will be issued after the final inspection has been completed and after the AQMD approves the initial compliance test report.

NOTE: Approval of the site remedial action work plan must first be obtained from the lead agency.

III. INSTRUMENTATION

The instrumentation listed below shall be permanently installed while the soil/ground-water remediation system is in operation.

- A. Each system shall have process instrumentation to monitor the process parameters listed in Section II.E.
- B. The instruments used to monitor the above parameters shall be of the type listed in Table 1. The use of any instrument not listed in this document shall be approved first by the AQMD.
- C. All instruments used to monitor the above parameters shall be calibrated as specified in Table 1, maintained according to manufacturer's recommendations, and permanently installed on the system.