SAN JOAQUIN VALLEY UNIFIED
AIR POLLUTION CONTROL DISTRICT
COMPLIANCE DEPARTMENT

COM 2250

APPROVED: **SIGNED** **DATE:** **March 8, 2007**

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TITLE: **RULE 4651 – SOIL DECONTAMINATION**

SUBJECT: **INSPECTION OF SOIL DECONTAMINATION OPERATIONS**

OBJECTIVE:

This document is to establish District policy and procedures for implementation of Rule 4651 – Volatile Organic Compound Emissions From Decontamination of Soil.

PURPOSE:

Rule 4651 limits the emission of volatile organic compounds (VOC) from the excavation and treatment of soil that has been contaminated by organic liquid as a result of leakage from storage or transfer facilities, or from accidental spillage, or other deposition. The purpose of this policy is to describe the procedures to be followed by District Compliance staff when they are inspecting these operations to ensure consistency and provide a level playing field for the industry.

POLICY STATEMENT:

Soil remediation projects are potentially significant sources of volatile organic compound emissions. In an effort to minimize these emissions, District staff will enforce requirements of Rule 4651 and specific facility permit conditions. Failure to comply with this rule and applicable permit conditions is a violation, which is subject to enforcement action.

GENERAL GUIDELINES:

The primary focus of Rule 4651 concerns the regulation of VOC contaminated soil that has been excavated from affected underground sites. Operators of such sites must provide written notification to the District prior to the commencement of "limited soil aeration" activities, but are not required to obtain a Permit to Operate (PTO).

In most instances, district staff will conduct compliance inspections of "permitted" soil decontamination systems comprised of one or a combination of:

a. Limited Aeration
b. Thermal oxidizers
c. Catalytic oxidizers
d. Internal combustion engines
e. Carbon canisters

Safety Considerations: Many of these units utilize high temperatures to destroy VOCs, so it is important to keep in mind that touching this equipment is not recommended. Wearing earplugs is also recommended. Beware of high voltage lines and tripping hazards in these often congested secure compounds. The presence of gasoline, diesel, or other "raw" VOC odors is sometimes indicative of a malfunction in the system and should be brought to the attention of the operator.

INSPECTIONS OF SPECIFIC DECONTAMINATION OPERATIONS:

Permitted facilities must be inspected at least every 24 months. Prior to the site inspection, the inspector should review all relevant information available in the district source file (via Permit Administration System).

Limited Aeration: Contaminated soil that has been excavated from former leaking underground storage tanks (LUSTS) may be treated on-site through a process of limited aeration. As previously stated, these sites are not required to have district permits to operate, therefore, inspections of these sites are not mandatory, but should be conducted at the interval recommended in the Inspection Frequency Guidelines.

Inspections should be conducted according to the requirements of Rule 4651, section 5.2. Site operators must monitor the organic content (in parts per million) of the contaminated soil. The amount of untreated soil that is allowed to be exposed to the ambient air for evaporation is dependent upon the concentration of VOCs in the soil. Table 1 specifies the quantities of contaminated soil that may be allowed to aerate, depending on the VOC content.

Inspectors that become aware of these sites either through surveillance or notification from the operators should verify that the operators are monitoring the soil VOC

content, covering contaminated soil that has not been treated, and not be adding quantities of untreated soil to stockpiles greater than allowed. Review records of these parameters and the results of required soil sampling.

Thermal Oxidizers: Generally, inspections of soil remediation sites must be prearranged. This is necessary because most equipment is either in locked compounds at unattended locations, at gasoline dispensing facilities where knowledgeable staff are not always present, or managed by off-site geological consulting businesses that employ technicians to make periodic trips to the sites.

The inspector should request that the operator or technician provide historical records of cumulative running time and the measured influent and effluent hydrocarbon concentrations. Inspectors shall utilize the "Soil Remediation Inspection Report" (see Attachment) to record data during the course of the start-up/compliance inspection. If the system is online, a Visible Emissions Evaluation should be taken at the exhaust stack. Note whether auxiliary fuel is being used to fire the unit. Ask the operator if the thermal oxidizer has been replaced by a catalytic oxidizer. Most PTOs require written notification before such a change is made. If the inspection is a start-up, the operator may be required by the Authority to Construct (ATC), to take laboratory samples of the influent and effluent gases. Assure that the proper procedures are followed during the collection and handling of the samples and that chain-of-command documentation is initiated. Record the times the samples are taken and the identification numbers assigned to each sample container.

Note the influent flow rate from the underground extraction wells. Most permits limit the flow rate into the decontamination systems. If the calculated units are not in standard cubic feet per minute (scfm), have the technician convert the data to these units. The operator should take influent/effluent samples utilizing an FID, PID, or other District approved VOC detection device. The inspector should assure that the influent gas should always be sampled "upstream" of any air dilution. Record the results of this sampling and the operating temperature of the thermal oxidizer. Most permits require a minimum of 1400 degrees F. for the combustion chamber of a thermal oxidizer. Record operating time and note whether the limits on the PTO (if present) have been exceeded.

Examine maintenance and sampling records to determine compliance with minimum frequency of sampling and control efficiency. If laboratory samples were taken during start-up inspections, the inspector should, in most cases, receive the results within 60 days or as required by the ATC. After the inspector reviews and approves the results of the lab samples for compliance with the control efficiency or the maximum daily VOC emissions (usually limited to 2 lbs, when control efficiency is less than 95%), a Change Order may be prepared.

Some of these units, usually located in remote areas, may utilize an Internal Combustion engine to power compressors or pumps. If the engine is greater than 50 HP, and the facility has not applied for a PTO, the inspector should take appropriate enforcement action.

Catalytic Oxidizers: As with thermal oxidizers, these systems use high temperatures to capture and convert VOCs to carbon dioxide and water. Catalytic oxidizers are often installed as replacements for thermal oxidizers once the VOC concentrations drop from influent gases. These units operate at lower temperatures (typically a minimum of 600 degrees F.). Inspectors should follow the same procedures used to inspect thermal oxidizers.

Internal Combustion (I/C) Engines: I/C engines are sometimes used for soil remediation purposes. Combustion temperatures are typically 2,000-2,500 degrees F., making I/C engines highly efficient in the control of VOC emissions. The high operating temperatures can produce excessive NOx, which necessitates the installation of catalytic converters to limit these secondary emissions. Inspection procedures parallel those for the oxidation systems.

Carbon Adsorption Canisters: These units are often installed when the initial concentrations of hydrocarbons from contaminated soil sites are lower than that which would necessitate destruction through thermal/catalytic oxidation (TCO). They sometimes replace TCOs during the final phases of soil decontamination or are the sole equipment installed at sites with low levels of VOC contamination. Most of the systems inspectors will encounter are simple units consisting of an electrically powered blower which draws a vapor-laden air stream from the extraction wells and forces it through piping into containers of activated carbon.

Permits usually require the installation of two or more carbon canisters connected in series. Inspectors should ask the operator if the canisters have been replaced or regenerated since initial installation. Have the operator demonstrate compliance by sampling the influent and effluent gas streams with a PID, FID or other approved VOC detection device. When reviewing facility VOC emission records, inspectors should take care to notice the emissions levels immediately prior to canister replacement, because the emissions may have exceeded allowed PTO limits prior to the change-out. Used carbon canisters removed from the system must be sealed vapor tight.

POST INSPECTION:

1. Discuss inspection findings with operator.
2. If records are not available during the inspection, the inspector shall issue a Notice to Comply requiring that the records be submitted within 7 days.
3. If any permit conditions have been violated, the inspector shall issue an NOV.

4. If the operator replaced a thermal oxidizer with either a catalytic oxidizer or carbon canisters, without notifying the District prior to doing so, an NOV shall be issued.

Following start-up inspections, operators may wish to continue operation of the soil decontamination systems. Inspectors should inform the operators that they may do so, however, if lab results received several days later indicate non-compliance with VOC control efficiency or emission rates, a Notice of Violation will be issued for the entire period in which the system operated. Inspectors may issue Change Orders after reviewing and approving required laboratory results.