Guidance on Air Emissions of VOCs at DER Remediation Sites

The below represents technical guidance that has been developed by the Division of Environmental Remediation (DER) and the Division of Air Resources (DAR) technical staff to ensure that remedial systems meet the substantive requirements of DAR regulations. Nothing in this guidance restricts the ability of DEC to require treatment of air discharges from remedial systems which DEC or NYSDOH determines is necessary to protect human health or the environment.

Treatment Requirements for Volatile Organic Chemicals (VOCs):

The High Toxicity Air Contaminant (HTAC) List is provided in 6 NYCRR Part 212-2.2 Table 2. For DER, the most common HTAC chemicals include:

- benzene,
- tetrachloroethylene (PCE),
- trichloroethylene (TCE),
- carbon tetrachloride, and
- vinyl chloride.

Treatment is required (as described in Part 212-2.1) for any remedial system that has a potential to emit greater than 0.1 lbs./hr. of a HTAC. Treatment is required below this level if the annual total emissions exceeds the Mass Emission Limit provided in Table 2 (examples provided below).

Chemical Name	CASRN	Mass Emission Limit (pounds per year)	Calculated average pounds per hour
Carbon tetrachloride	56-23-5	100	0.011
Benzene	71-43-2	100	0.011
Vinyl Chloride	75-01-4	100	0.011
Trichloroethelene (TCE)	79-01-6	500	0.057
Perchloroethylene (PCE)	127-18-4	1000	0.11

If the remedial system does not have the potential to emit greater than 0.1 lbs./hr. of a HTAC and potential emissions are below the Mass Emission Limit, then no treatment and no further evaluation is required. If potential emissions are above the Mass Emission Limit, but below 0.1 lbs./hr., then treatment is required unless a Toxicity Impact Analysis is provided, in accordance with DAR-1, demonstrating compliance with Annual Guideline Concentrations/Short-Term Guidance Concentrations (AGC/SGCs).

For non-HTAC volatile organic chemicals, treatment is required if the system has the potential to emit total VOCs at a rate greater than 0.5 lbs./hr.

The following systems require treatment based on DER experience:

- **Soil vapor extraction (SVE)** systems are expected to require treatment;
- **Thermal remediation** (in- or ex-situ) will generally require treatment;
- **Excavation enclosures:** Temporary structures in place to control vapors and odors from excavation of contaminated soils will generally require treatment.
- **Air strippers** generally would not require treatment, however, for larger systems or systems with HTACs, it is good practice to confirm this; and

- **Sub-slab depressurization systems (SSDS)** This guidance does not alter the requirement for compliance with the minimum requirements of the NYSDOH SVI guidance. Generally, SSDS do not require off-gas treatment. For larger systems or systems with HTACs, the need for treatment to comply with this *Guidance on Air Emissions at DER Remediation Sites* should be evaluated. For SSDS discharges unavoidably near receptors, treatment should be considered (e.g. dense residential/commercial neighborhoods).

Major Sources:

DAR has additional requirements for major sources of contamination, as described in 6NYCRR Part 201-2.1(b)(21).

- For VOCs, the threshold to be considered a major source for the majority of the state is 50 tons/year. In the NY Metro Area (all of Long Island, New York City, Rockland County, Westchester County, and the Orange County towns of Blooming Grove, Chester, Highlands, Monroe, Tuxedo, Warwick, and Woodbury) the threshold is 25 tons/year.

- For hazardous air pollutants (HAPs) statewide, the thresholds are 10 tons/year for any single HAP and 25 tons/year for any combination of HAPs.

If any of these thresholds may potentially be exceeded, DAR must be consulted to ensure that air treatment and discharge meet all applicable requirements.

Ozone Depleting Substances and Greenhouse Gases:

For any remediation option which would discharge chlorofluorocarbons (CFCs) or other ozone depleting substances (ODS), the Feasibility Study or Alternatives Analysis must evaluate the feasibility of treatment to minimize discharge of ODS. If treatment to minimize discharge of ODS is required, it must be called for in the Decision Document (such as the Record of Decision) using the remedy selection criteria found in 6 NYCRR Part 375-1.8(f).

DER-31 and CP-49 require that the cleanup of remedial sites be considered in a larger context, including ODS and greenhouse gas (GHG) emissions. Some CFCs (as well as hydrofluorocarbons (HFC) and methane) are potent GHGs, some of which are thousands of times more potent than CO_2. Unnecessary discharge of these potent GHGs should be avoided.

The most common CFCs are Freons (e.g. Freon 114, Freon 11, Freon 23, Freon 12). Some of these are readily treated with activated carbon, but some are not. The following chart provides a comparison of the adsorption capacities for several Freon compounds relative to PCE and TCE:

Freon 23:	0.0001 gm adsorbed/100 gm carbon
Freon 12:	3.1 gm adsorbed/100 gm carbon
Freon 113:	20.0 gm adsorbed/100 gm carbon
TCE:	16.6 gm adsorbed/100 gm carbon
PCE:	27.5 gm adsorbed/100 gm carbon