AIR SPARGING

Facility or Tank ID: _____ Leak ID: _____

Do not proceed unless a site characterization has been completed that fully delineates the extent of contamination.

I. Applicability Determination (initial screening)	Effective	Somewhat Effective	Ineffective
1. Is free product present at the site? Air sparging cannot be performed in presence of free product. Free product must be removed before air sparging can be used at a site.	☐ NO		☐ YES
2. Provide a general description of the **Intrinsic Permeability (k)*** of soils in the area of remediation measured in cm^2. ☐ Based on soil type ☐ Calculated ☐ Field/lab test *Stratified soils may require special consideration in design to ensure less-permeable stratum are addressed. This will require documentation.*	☐ $k \geq 1x10^{-9}$	☐ $1x10^{-9} \geq k \geq 1x10^{-10}$	☐ $k < 1x10^{-10}$
3. What is the general boiling point range in Celsius (°C) for chemicals subject to remediation at this site? *For complex mixtures, select the boiling point range that is most representative of the chemicals of concern to be remediated by using this remedy.*	☐ < 250	☐ ≥ 250 - ≤ 300	☐ ≥ 300
4. What is the total dissolved iron (mg/l) concentration at the site?	☐ < 10	☐ ≥ 10 - ≤ 20	☐ > 20
5. Is the soil free of impermeable layers or other conditions that would disrupt air flow?	☐ Yes	☐ Maybe	☐ No
6. What is the vapor pressure range in millimeters (mm) of mercury for the chemicals being remediated? *For complex mixtures, select the vapor pressure range that is most representative of the chemicals of concern to be remediate.*	☐ ≥ 1	☐ > 0.5 - < 1.0	☐ < 0.5
7. What is the **Henry Laws Constant**** (atm)for the chemicals being remediated? *For complex mixtures, select the Henry's law constant range that is most representative of the chemicals of concern to be remediated.*	☐ > 150	☐ ≥ 100 - < 150	☐ < 100

* Intrinsic permeability is a measure of the ability of soils to transmit fluids and is an important factor in determining the effectiveness of air sparging.

** Here is a link to an EPA website with common Henry Law Constants for various chemicals. Choose Hpx (partial pressure/mole fraction)

https://www3.epa.gov/ceampubl/learn2model/part-two/onsite/esthenry.html

AIR SPARGING

I. Applicability Determination (initial screening continued)	Effective	Somewhat Effective	Ineffective
8. The air sparge well used for pilot testing is in an area of contamination that is best described as: **Note:** *Pilot testing is required. Testing the system in areas of low contamination may provide insufficient data but testing in high areas of contamination can induce migration of contamination.*	☐ Moderate	☐ Low	☐ High
9. What is the radius of influence (ROI) in feet for the proposed extraction wells?	☐ > 20	☐ > 5 - ≤ 20	☐ < 5
II. Air Sparge Design			
1. Has the radius of influence (ROI) been calculated for each soil type to the site in the area of contamination?	☐ YES		☐ NO
2. Is the proposed well density appropriate, given the total area to be cleaned up and the radius of influence of each well?	☐ YES		☐ NO
3. Will the proposed air sparging pressure be sufficient to overcome the hydraulic head and capillary forces?	☐ YES		☐ NO
4. Will the air sparge flow rates provide sufficient vapor/dissolved phase partitioning of constituents to achieve cleanup?	☐ YES		☐ NO
5. Is the proposed well configuration appropriate for the site conditions present?	☐ YES		☐ NO
6. Is the air compressor selected appropriate for the desired sparge pressure?	☐ YES		☐ NO
7. Do the proposed well screen intervals match with the contaminant plume location at the site?	☐ YES		☐ NO

III. Other Remedial Technologies

1. What other remedial technology will be used in conjunction with air sparging?

☐ Soil vapor extraction ☐ Aggressive fluid vapor recovery

☐ Dual phase extraction ☐ Other (identify): _____

AIR SPARGING

IV. Evaluation of Operation and Maintenance

The air sparge system should not be started prior to the start of the SVE or other remedial technology being utilized with the air sparge.

Manifold valving adjustments should be checked and adjusted as necessary during the first week of operation.

Monitoring for sparge pressure and flows, vacuum readings (for SVE, DPE, etc.), groundwater depth, vapor concentrations, dissolved oxygen levels, carbon dioxide levels, and pH should be performed for the first week of operation.

Weekly to biweekly monitoring of groundwater pH and levels of contaminates, carbon dioxide, and dissolved oxygen should be performed follow startup.

Weekly to biweekly monitoring of the effluent stack for levels of contaminants, oxygen, and carbon dioxide should be performed following startup .

All monitoring information should be provided in the CAP monitoring report.

V. Sitemap

Attach a site map to this document

1. Site map(s) drawn to scale illustrating the following:
    a. Location of all present and former tanks, piping and dispensers in area of release;
    b. Footprint of surface and/or subsurface soil contamination;
    c. Footprint of other structures (buildings, canopies, roads, utilities, etc..);
    d. Location of treatment systems;
    e. Location of extraction and air sparging wells;
    f. Monitoring wells that will be used for sampling;
    g. Groundwater flow direction;
    h. North arrow, bar scale, and map legend

CAP Analytical Parameters Attachment

Well/Sample Location	Parameters to be Monitored

Comments