Flow Chart Instructions

Follow the LAST/LUST Soil Remediation Process flow chart.

Step 1: Is soil contamination in contact with or in close proximity (within 10 feet) to groundwater?

NO, proceed to **Step 2**.

YES, **Stop.** This flow chart CANNOT BE USED for the site until groundwater investigation has been completed. Soil mitigation and a groundwater investigation should be completed as appropriate. Once groundwater results are all below groundwater standards, then soil can be evaluated against the action level and you can then proceed to **Step 2**.

Step 2: Is free product present?

NO, free product is not present in the groundwater or vadose zone, proceed to **Step 2.b**.

YES, free product is present. Identify if the free product is in the groundwater or if the product is in the vadose zone only. Continue to **Step 2.a.i** and **2.a.ii**.

2.a.i. If product is in the groundwater, Stop this flow chart CANNOT BE USED until free product mitigation is performed and a groundwater investigation is completed. Once groundwater results are all below groundwater standards, then repeat the process starting at **Step 1.**

2.a.ii. If free product is only in the vadose zone, proceed to **Step 6**. After mitigation of free product from the soil, perform post mitigation sampling and restart the process at **Step 1.**

Step 2.b: Screen soil data against Tier 1 Action levels. Are soil values (maximum concentration or UCL, if appropriate) less than the Tier 1 Screening Criteria?

NO, proceed to **Step 3**.

YES, proceed to **Step 7** and request a No Further Action letter.

STEP 3. Did any soil sample fail Tier 1 screening for benzene, toluene, ethylbenzene, MTBE, or naphthalene)?

NO, proceed to **Step 4** and screen against Tier 2 action levels.

YES, go to **Step 3.a** to determine if Limiting Factors must be considered.

STEP 3.a: If there are any on-property buildings or adjacent off-property buildings (current or proposed) that are within proximity distance (30 foot laterally or 5 feet vertically for petroleum contaminants) of the contaminated area, then potentially limiting factors must be considered for Tier 2 and Tier 3 levels. Identify if there are any of the following limiting factors that would preclude the use of the Tier 2 or Tier 3 soil action levels without further mitigation. *(Note: Consideration of limiting factors only applies to action levels that were derived based upon vapor intrusion as the more conservative exposure pathway. For the common petroleum contaminants, the following action levels were based on vapor intrusion exposure pathways: benzene, toluene, ethylbenzene, MTBE, and naphthalene).* Limiting factors in many cases may be easily mitigated by sealing an opening or the use of soil like materials to provide a vertical separation between contaminant and receptor. **Answer all the following questions on "Limiting factors" prior to proceeding further**.

i. *Preferential Pathways* – Is there a preferential pathway that enters the current building(s) or anticipated future buildings? *A preferential pathway is a natural or man-made feature that allows vapor migration from a potential vapor intrusion source into a building.*

ii. *Significant Foundation Openings* – Is there a significant foundation opening at the current building(s)? *A significant foundation opening is a breach in a building foundation or basement wall that may amplify the entry of subsurface vapors. Examples of a significant foundation opening may be a dirt floor, a large opening in the basement wall or floor, or a sump.*

iii. *Soil-like Material and Soil Lithology* – Is the soil lithology in the contamination area mostly sand, gravel, or another material with greater hydraulic conductivity that silt loam? *If the soil lithology is sand, gravel, or another material with greater hydraulic conductivity than silt loam, additional mitigation will be required. However, if there is a minimum of a five (5) foot vertical separation between the contamination and all potential receptors with a soil like material (silt loam or soil with less hydraulic conductivity than silt loam) then there would be no limiting factor.*

iv. Is there **less** than thirty (30) foot laterally and less than five (5) foot of vertical separation between the contamination and all potential receptors (including current or potential buildings)? Examples of this would be shallow contamination commonly found around spill buckets, piping runs, and dispensers.

NO, none of the limiting factors listed above apply or they have been mitigated. Proceed to **Step 4**.

YES, one or more of the limiting factors listed above apply. Proceed to **Step 6**.

Step 4: Screen against the Tier 2 action level *(Note: Keep in mind that Tier 2 has screening criteria for 2 different depths. If sampling depth is unknown, you must screen against the 0-8 feet depth. Also, upper confidence levels may be calculated for use if sufficient data sets exist).* Once the data has been screened, proceed to **Step 5**.

Step 5: Is there any exceedances of the applicable Tier 2 screening criteria?

NO, proceed to **Step 7** and request a No Further Action letter.

YES, there was an exceedance of the applicable Tier 2 screening criteria, proceed to **Step 5.a.**

Step 5.a. Is the property zoned to exclude residential usage?

NO, proceed to **Step 6,** the Tier 3 standard cannot be used for the site.

YES, proceed to **Step 5.b**.

Step 5.b. Will the property owner impose a restriction on the deed preventing the property from being used for residential purposes?

NO, proceed to **Step 6,** the Tier 3 standard cannot be used for the site.

YES, proceed to Step **5.c** and screen the soil data against the Tier 3 levels.

Step 5.c. Screen against the Tier 3 action level. (*Note: Keep in mind that Tier 3 has screening criteria for 2 different depths. If sampling depth is unknown, you must screen against the 0-8 feet depth. Also, upper confidence levels may be calculated for use if sufficient data sets exist).* Did any sample data exceed Tier 3 Levels?

NO, proceed to **Step 5.d**.

YES, proceed to **Step 6**.

Step 5.d. Perform the following:

i. Review Section 12.4.4 of the CAGD to ensure that the site meets all the criteria for using the Tier 3 standard.

ii. Provide documentation to the WVDEP showing the current zoning for the property as non-residential.

iii. Provide a copy of the proposed language for the deed restricting the property to non-residential usage. *(Note: the deed must have language that prevents the property from being divided up in such a manner that would allow soil contamination to be within 30 feet of the property border.)* WVDEP will review the proposed language for approval.

iv. Provide a site map showing the area of contamination and the distances to any buildings and property borders.

v. After WVDEP approval, file the deed with the property restriction at county courthouse where the property is located.

vi. Provide documentation showing that the deed with the approved restrictive language was filed at the courthouse.

vii. Proceed to **Step 7** and request a No Further Action letter.

Step 6: Mitigation activities must be completed. Post-mitigation soil samples may need to be collected. After the mitigation activities have been completed, repeat the flow chart process starting at **Step 1**.

Step 7: The soil screening process is complete and no further remediation is required. Request a "No Further Action" letter.