

**Soil-Vapor Extraction System Expansion Work Plan
Part I: Candidate Well Identification and Pilot Testing
Bulk Fuels Facility Spill, Solid Waste Management Units ST-106 and SS-111
Kirtland Air Force Base, New Mexico**

1. This plan will ultimately be viewed by the public. Identify all acronyms at first use and explain technical terms and provide the rationale for proposed actions, where appropriate.
2. Page ES-1 -add a figure 1-2 that depicts all wells referenced in the plan including, but not limited to, SVE wells SVEW-01 through SVEW-09.
3. Section 1.1, Page 1-2 – describe both current and past (January to July 2013) observed wellhead vacuum pressures, wellhead VOC (designated as total hydrocarbons [THCs] in the text) concentrations and CATOX influent VOC concentrations.
4. Section 1.2, page 1-2 – identify the two SVE wells referenced in the first sentence.
5. Section 2.1, page 2-1 – discuss the dimensions of the zone of influence relative to the referenced 13 wells and the locations of the 13 wells relative to the BTEX plume and the pre-submergence LNAPL plume. Include a figure 1-3 that illustrates the same areal extent shown in Figure 1-1 that depicts the wells, the BTEX plume, the EDB plume and the LNAPL plume that includes the 13 wells and the wells inside the zone of influence. Include groundwater monitoring wells on the figure.
6. Section 2.1.1, page 2-1 – delete the first paragraph or include a full description of the cited “technical discussions.” Deletion is preferred.
7. Section 2.1.1, page 2-2, 1st paragraph, 1st sentence – KAFB-16113 should be KAFB-106113.
8. Section 2.1.1, page 2-2, 2nd paragraph states “[w]ells KAFB-106142 and KAFB-10628, located in Bullhead Memorial Park will also be included in pilot testing.” Clarify that these wells will be part of the long-duration testing.
9. Section 2.1.1, page 2-2 - soil vapor benzene concentrations are referenced for KAFB -10628. Provide the First Quarter 2013 detected benzene concentration for KAFB 106142. Provide the depths were these soil vapor samples were collected. Express the soil vapor concentrations in ug/L.
10. Section 2.1.1, page 2-2, second paragraph, second sentence – it appears that a number is missing in the referenced well (KAFB-10610__).
11. Section 2.2.1, page 2-2, third paragraph – assuming that KAFB-106111 is constructed with the same configuration as the other wells, delete the second sentence as a rationale for excluding the well from the test. Although the screen length is only 10 feet, it is located in a hydrocarbon rich zone. Extracting from KAFB-106111 may be more effective for removing hydrocarbons than the longer screened Pneulog well KAFB-106156 that is also pulling vapors from less hydrocarbon rich zones higher in the vadose zone.



12. Section 2.2.1, page 2-2, third paragraph - include the KAFB-106111 boring log and depict the well on Figure 1-1 and also on added Figure 1-2.
13. Section 2.1.1, page 2-3 – include total VOCs in the concentrations comparison in the Pneulog well selection criteria.
14. Section 2.1.2, page 2-3, first paragraph – clarify whether the referenced pilot testing will be the same or different from the SVE expansion pilot testing.
15. Section 2.2, page 2-4, second paragraph - clarify whether the referenced pilot testing will be the same or different from the SVE expansion pilot testing.
16. Section 2.2.1, page 2-4, second paragraph – explain how “...as much vacuum as possible” will be determined.
17. Section 2.2.1, page 2-4 and Section 2.2.2, page 2-5 – describe the proposed applied vacuums for each quick test and long duration test and the rationale for the proposed applied vacuums.
18. Section 2.2.2, page 2-5 – explain the criteria to be used to select the wells for the long duration tests.
19. Section 2.2.2, page 2-5, states that the vacuum applied to each test well for the long duration testing will remain constant for the duration of the test. Include vacuum step testing as part of each long-duration pilot tests.
20. Section 2.2.2, page 2-5 – include a table that identifies the observation wells to be monitored for the five wells identified for the long duration tests and the criteria for selection of observation wells for the to-be-selected additional long-duration tests. Propose monitoring for vacuum pressures (prior to the start, after 30 minutes, and just prior to the end of tests) in the wells located closest to the wells selected for the short-term tests.
21. Section 2.2.2, page 2-6, second sentence should refer to the long-duration tests rather than the quick tests.
22. Section 2.2.3, page 2-6, paragraph one states “[d]uring the 4th qtr CY 2013 vapor sampling event, 35 soil-vapor well locations will be sampled in conjunction with quarterly sampling.” Identify the 35 soil vapor wells to be sampled. Also, clarify whether quarterly sampling is for groundwater sample collection, vapor sample collection, or both throughout the work plan. T
23. Section 2.2.3, page 2-6, paragraph one – provide the hydrocarbon detection range (minimum and maximum) of the Horiba MEXA 584L and include the units of measure.
24. Section 2.2.3, page 2-6, paragraph two states, “[n]o samples will be collected during the one hour quick tests as...” Clarify that samples will not be collected for laboratory analysis since paragraph one states that field samples will be collected for analysis using the Horriba.

25. Section 2.2.3, page 2-6, paragraph three – provide the analytical method(s) to be used for laboratory analyses.
26. Section 2.2.3, page 2-7 - list a graph depicting the observed vacuum versus distance from SVE well for estimating the radius of vacuum influence (ROI) that will be plotted on semi-log paper.
27. Section 2.2.3, page 2-7 – list summary data tables corresponding to each graph.
28. Section 2.2.4, page 2-7 - propose monitoring for vacuum pressures (prior to the start, after 30 minutes, and just prior to the end of tests) in the wells closest to the wells selected for the short-term tests.
29. Section 2.2.4, page 2-8, states “[a]t least 5 observation wells should be selected for each long duration pilot test.” The use of the term “should” implies uncertainty with regard to the proposed work. State what the proposed work will actually include.
30. Section 2.2.4, page 2-8 - provide a table that identifies the long duration pilot test wells identified and the proposed associated observation wells. Include the distance between each observation well and its respective extraction pilot test well and the screened intervals in both the extraction and observation wells. In addition, include sample field data sheets for the long duration tests and the Quick Tests.
31. Section 2.3, page 2-8, first sentence - provide benzene concentration ranges relative to time.
32. Section 2.3, page 2-8, second sentence - identify the wells referenced as “certain soil-vapor wells.”
33. Section 2.3, page 2-8, third sentence – discuss the reduction in flow from the current SVE wells and the anticipated flows relative to the wells to be added in terms of current and anticipated future applied vacuum pressures.
34. Section 2.3, page 2-8 – discuss how the CATOX is capable of treating the influent from added wells and the dilutions necessary to avoid fouling or breakthrough.
35. Section 2.3.1, page 2-9, first sentence - , explain why Pneulog well KAFB-106150 is not proposed to be plumbed to the current SVE system since it will be pilot tested.
36. Section 2.3.1, page 2-9, fourth sentence states “[c]alculations will confirm the pressure drop and pipe sizes based on the anticipated maximum recovery rates from each well.” Provide the calculations with an accompanying explanation.
37. Section 2.3.1, page 2-9 – note that tie-in construction drawings for pilot test wells that will utilize existing piping, stamped by a licensed NM Professional Engineer will be required.

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Work Plan NMED Comments
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38. Section 2.3.1, page 2-9, clarify that the term “home run” means dedicated lines that run directly from the pilot test wells to the SVE treatment system.
39. Section 3.1, page 3-1, bullet 15 – add a reference to observation well vacuum monitoring for the quick tests (see comment 28 above)
40. Section 3.1, page 3-1 – propose a date for the submittal of a SVE expansion pilot test report that summarizes the results of the tests and provides recommendations for expansion of the SVE system. The submittal date must be at least 75 days prior to the submittal date for the fourth quarter CY 2013 report which, based on previous submittal timeframes, is anticipated to be at the end of March, 2014.
41. Section 3.1, page 3-1, bullet list - clarify that bullets 4-17 are sub-bullets to bullet 3.
42. Appendix A - the figures for the existing SVE wells cite the depth to groundwater but do not show the water table on the drawing. Also, the arrow indicating Ground Surface Elevation for both wells points at the top of the concrete pad which suggests that it references the concrete pad elevation. Clarify whether the elevation given is the surveyed ground surface elevation or the concrete pad elevation. Correct the figures as necessary.