DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 377TH AIR BASE WING (AFMC)

MAR 1 4 2011

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Mr. Bearzi

As was discussed in the meeting 7 March 2011, Kirtland AFB is providing a table of proposed responses to the NMED letter "Bulk Fuels Facility Spill (SWMUS ST-106 and SS-111) Notice of Partial Approval With Modifications and Notice of Disapproval Interim Measures, Vadose Zone, and Groundwater Investigation Work Plans, November 2010 Kirtland Air Force Base, EPA ID# NM9570024423 HWB-KAFB-10-015, HWB-KAFB-10-016, HWB-KAAFB-10-019"; dated 10 December 2010.

Attachment 1 is an itemized list addressing each concern covered in your letter. We have reviewed your letters direction and agree that the bulk of the 72 individual concerns require correction/alteration to the existing plans. Attachment 2 is a listing of 23 items we would like to discuss further to ensure our proposed responses fulfill NMED requirements. We believe these items can be best handled in an open discussion with your office, followed by an official submittal of corrected work plans incorporating the changes as agreed to in the meeting. The face-to-face meeting will help clarify the identified discrepancy and ensure the work plans to be resubmitted meet all your requirements.

I am proposing that a meeting be scheduled for approximately 2 hours, in the NMED Albuquerque offices, sometime between 15-17 March. This will give enough time to incorporate the agreed upon changes and expedite delivery of the subject documents before 31 March 2011.

If you have any questions with regard to these submittals, please contact Mr. John Pike at (505) 846-8546.

Sincerely

ROBERT L. MANESS, Colonel, USAF
Commander

Attachments:
1. Full Table of Comments to NMED 10 Dec 2010 letter
2. Suggested Comments Requiring Further Review from NMED 10 Dec 2010 letter

cc:
NMED HWB - Mr. Moats, w/ atchs electronic and hardcopy
NMED GWQB - Mr. Olson, w/ atchs electronic and hardcopy
NMED HWB - Mr. McDonald, w/o atchs
NMED HWB – Mr. Brandwein, w/o atchs
USEPA-Region 6 (6PD-N), Ms. King, w/o atchs
AFCEE, Mr. Oyelowo, w/o atchs
USACE, Mr. Midgal, w/o atchs
Admin. Record, CNM, Montoya Campus w atch
File

377 AFNWC/JA RESEARCHING VALIDITY OF ALL JULY 2010 PERMIT REFERENCES AND REQUIREMENTS			
PART 1 REVIEW			
No.	**NMED COMMENT**	**PROPOSED WORK PLAN ACTION**	**PROPOSED RESPONSE TO COMMENT**
1	The Permittee shall also complete the removal of the former Fuel Offloading Rack and the excavation of contaminated soil exceeding NMED Soil Screening Levels (SSLs). **PAGE 2 SECT A**	No change to work plan required	The former Fuel Offloading Rack (FFOR), and associated piping, has been removed under the MILCON USACE contract. Soil along the pipeline will be sampled and excavated as required.
2	The Permittee shall therefore immediately commence installation of the 78 groundwater monitoring wells provided for in Section 5.2.4 of the revised Groundwater Investigation Work Plan. The installation of the wells shall be completed by April 28, 2011 (Appendix B of the Groundwater Investigation Work Plan). **PAGE 2 SECT A**	No change to work plan required	As stated in work plan.
3	Section 5.2.4.1 of the Groundwater Investigation Work Plan, *Monitoring Well Installation Procedures*, item #6 states that three PVC centralizers would be used in well construction, one installed directly above and one below the well screen and one installed at the midpoint of the well. In lieu of a centralizer installed at the midpoint, the Permittees shall install PVC centralizers approximately every 100 feet between the top of screen and the ground surface. **PAGE 2 SECT A**	Section 5.2.4.1 of the Groundwater Investigation Work Plan, item #6, will be revised to read: "PVC centralizers will be installed approximately every 100 feet along the length of the well between the top of the screen and the ground surface."	Changes will be incorporated.
4	Each of the new wells shall be developed pursuant to Permit Part 6.5.17.10.6. Pursuant to Permit Part 6.5.17.3, initial groundwater samples shall be obtained from newly-installed monitoring wells within 30 days after completion of well development. Groundwater sampling and reporting requirements shall be conducted as directed in NMED's letter of June 4, 2010, and as specified in Permit Part 6.5.17.5. **PAGE 3 SECT A**	The text in Section 5.2.4.3, *Well Development*, will be edited to clarify that the NMED Hazardous Waste Department will be notified for approval, prior to the introduction of air, water, or other fluid during development. A description of groundwater sampling and reporting requirements will be included in the Quality Assurance Project Plan.	Changes will be incorporated
5	NMED is again directing the Permittee to develop all existing wells located within the LNAPL plume, and to make such wells available to sample groundwater. Well development shall be conducted in accordance with Permit Part 6.5.17.10.6. The work must be completed no later than February 15, 2011. **PAGE 3 SECT B**	No changes to the work plan required.	Development of the existing wells was completed on 10 February 2011.
6	NMED approves the Permittee's proposal to conduct borehole geophysical logging (medium and deep induction, gamma, and neutron) at all existing groundwater monitoring wells. Copies of the logs must be submitted to the NMED by no later than February 15, 2011. **PAGE 3 SECT C**	No changes to the work plan required.	The borehole geophysics of the existing wells was completed on 21 December 2010. The logs were posted to the NMED data portal site on 10 February 2011.
7	The Permittee shall immediately complete the 35 deep and 5 shallow soil borings provided for in Section 5.2.10 of the revised Vadose Zone Investigation Work Plan. The work shall be completed by February 11, 2011(Appendix B of the Vadose Zone Investigation Work Plan). Each deep boring at each location shall be drilled from the surface to the water table. Soil samples from the deep borings shall be collected at a frequency of at least one sample every 10 feet for the first 50 feet, and at least one sample thereafter every 50 feet to total depth, and at least one sample at total depth in each boring. The soil samples shall be analyzed for TPH, VOCs, SVOCs, and lead.	The work plan text will be edited to state: "These soil samples will be analyzed for VOCs, semi-volatile organic compounds (SVOCs), total petroleum hydrocarbons (TPH), and lead." Only the soil vapor monitoring well locations listed in Table 1 of the NMED August 6, 2010 letter will be sampled. The remaining eight locations (Table 2 of the August 6, 2010 letter) will not be sampled.	The drilling and sampling of the SVM wells will be completed as stated in work plan, with revisions. The installation of all 35 of the SVM well locations will not be completed by February 11, 2011. Eight of the well locations are around the existing fuel tanks at the facility, which are scheduled for demolition and site restoration in April 2011. As a result, the eight SVM wells around tanks cannot be installed until this work is completed. The SVM wells will be completed within 60 days of tank demolition and site restoration.

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No.	**NMED COMMENT**	**PROPOSED WORK PLAN ACTION**	**PROPOSED RESPONSE TO COMMENT**
7 (Continued)	Soil samples from shallow borings shall be collected at depths of 0,5, 10, 15, and 20 feet and shall be analyzed for TPH, VOCs, SVOCs, and lead. Each soil boring shall be logged in accordance with Permit Part 6.5.15 by a registered professional geologist. **PAGE 4 SECT D**	Boring will be logged by a qualified geologist. The boring logs will be reviewed and approved by a registered Professional Geologist as they are completed.	
8	The Permittee shall immediately install the 35 soil-gas monitoring wells provided for in Section 5.2.11 of the revised Vadose Zone Investigation Work Plan submitted November 4, 2010. The well installations shall be completed by February 11, 2011 (Appendix B of the Vadose Zone Investigation Work Plan). The soil-gas monitoring wells shall be capable of yielding discrete samples of soil gas recovered from depths of 25, 50, 150, 250, 350, and 450 feet below the ground surface. The borehole of each well shall be logged in accordance with Permit Part 6.5.15 by a professional geologist. Vapor sampling and reporting requirements shall be conducted as directed in NMED's letter of June 4, 2010. **PAGE 4 SECT E**	No change to the work plan required. Boring will be logged by a qualified geologist. The boring logs will be reviewed and approved by a registered Professional Geologist as they are completed.	The installation of the 35 soil gas monitoring wells will be conducted as stated in work plan. However, the installation of all 35 of the SVM well locations will not be completed by February 11, 2011. Eight of the well locations are around the existing fuel tanks at the facility, which are scheduled for demolition and site restoration in April 2011. As a result, the eight SVM wells around tanks cannot be installed until this work is completed. The SVM wells will be completed within 60 days of tank demolition and site restoration.
9	NMED approves the Permittee's proposal to conduct borehole geophysical logging (medium and deep induction, gamma, and neutron) at all new groundwater and soil-vapor monitoring wells. Copies of the logs must be submitted to the NMED by no later than June 1, 2011. **PAGE 4 SECT F**	No changes to the work plan required	Borehole geophysical logging will be conducted in the deep groundwater and soil vapor monitoring wells within 30 days of each well installation. The data will be reviewed and included in the quarterly reports, as well as posted to the NMED data portal. The completion of wells is dependent on ROE access. Additionally, the demolition and site restoration associated with the existing fuel tanks will also impact the schedule for well completion and therefore geophysical logging
10	NMED approves the Permittee's proposal for sample analysis, with the following modification: Soil samples shall be analyzed in the laboratory for TPH, volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and lead, and collected on all sides and the bottom of the excavation at a spacing not to exceed 25 feet. Additionally, the excavation of soil and removal of the former Fuel Offloading Rack shall be completed by October 6, 2011, and a report on completion of the work submitted to the NMED by January 15,2012. **PAGE 5 SECT G**	No changes to the work plan required. Removal of the former Fuel Offloading Rack and submission of a report on completion of the work will be completed in accordance with the Project Schedule in Appendix B of the Interim Measures Work Plan.	Soils samples will be analyzed for VOCs, SVOCs, TPH, and lead. Schedule will include completion of this task prior to 6 October 2011 and 15 January 2012.

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11	NMED approves the Permittee's soil sampling plan except as modified below. Section 4.5.2 of the Interim Measures Work Plan, *FFOR Soil Investigation and Sampling,* indicates that the direct-push technology (DPT) samples are to be collected at the former Fuel Offloading Rack (FFOR) and along the remaining aboveground and underground piping on 25-ft centers. The Permittee does not adequately describe the locations of the samples nor are the locations individually depicted on Figure 4-2. No additional sampling is proposed for the known three locations of pipeline leaks, which occurred approximately 18 ft, 150 ft, and 200 ft from the west end of FFOR. **PAGE 5 SECT G**	Figure 4-2 of the Interim Measures Work Plan, will be revised to depict the proposed sample locations and the approximate locations of the pipeline leaks at 18 feet, 150 feet, and 200 feet from the west end of the former Fuel Offloading Rack.	As stated in work plan, with revisions. The approximate location of the pipeline leaks will be estimated from historical aerial photographs and as-built drawings for the FFOR. The revised Figure 4-2 is attached to this document.
12	For underground piping from Building 1033 (Pump House) to its terminus at the west end of the FFOR, the Permittee shall instead collect soil samples on 10-ft centers along a line oriented directly over what was once the centerline of the now-excavated pipeline (hereafter referred to as the former pipe centerline). Soil samples shall also be collected at locations spaced no further than 10ft apart along two lines oriented parallel to the former pipe centerline, with the two lines situated no further than 5 ft from and on opposite sides of the former pipe centerline. Sampling shall also be conducted directly beneath each of the three known leak locations. **PAGE 5 SECT G**	The Interim Measures Work Plan, Section 4.5.2, will be revised to read: "DPT borings will be drilled along each side of the FFOR pipeline. Geoprobe® borings will be along a line oriented directly over what was once the centerline of the now-excavated pipeline, with 10 feet between boring samples. In addition, Geoprobe® borings will be advanced along two lines oriented parallel to the former pipe centerline with the two lines situated no further than 5 feet from and on opposite sides of the former pipe centerline. Samples will be collected directly beneath the three known leak locations: 18 ft, 150 ft, and 200 ft from the FFOR." The above stated sampling locations will also be included in the Quality Assurance Project Plan.	As stated in work plan, with revisions.
13	At each of the three known leak locations, sampling shall be increased by collecting soil samples at 5 ft by 5 ft grid nodes. At each sampling location, soil samples shall be collected at depths of 0,5, 10, 15, and 20 feet. If lead, VOCs, or SVOCs are detected in soil at concentrations exceeding the NMED SSLs at a given location, the soil at the location shall be excavated, removed from the site, and properly disposed of. The Permittee shall also increase the sampling grid at the location by using the same method as directed above for sampling the three known leak locations, and collect and analyze the additional samples. Expansion of sampling and the collection and analysis of additional samples shall continue until all soil containing VOCs, SVOCs, or lead at concentrations exceeding the NMED SSLs have been excavated. **PAGE 5 SECT G**	The Interim Measures Work Plan, Section 4.5.2, will be revised to include the following paragraph: "At each of the three known leak locations, soil samples will be collected at grid nodes with 5 ft spacing. Samples will be collected from depths of 0, 5, 10, 15, and 20 ft bgs for TPH, VOCs, SVOCs, and lead. If COCs are detected at concentrations greater than the NMED SSLs, then additional sample location(s) will be stepped out to a new grid node location (5 ft space) and samples will be collected at the same depth intervals. Soil with COC exceeding NMED SSLs will be excavated as described in Section 4.5.3."	As stated in work plan, with revisions

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14	Section 4.5.2. I, Bullet 4, of the Work Plan states "The field Geologist will collect samples for laboratory analysis that appear to contain the greatest degree of contamination based on visual observation and headspace VOC screening ... ", suggesting that not all samples will be submitted to the laboratory for analysis. Because headspace analysis will not detect lead and may not detect SVOCs, all soil samples must be submitted to the laboratory for analysis. **PAGE 6 SECT G**	The Interim Measures Work Plan, 4th bullet in Section 4.2.2.1, will be revised to include the statement: "A sample will be collected from the stated depth intervals and the associated headspace reading recorded."	As stated in the work plan, with revisions
15	Confirmation samples are samples collected to verify that all contaminated soil with concentrations of hazardous constituents exceeding the NMED SSLs has been excavated and removed. In Section 4.5.3.6, *Confirmation Sampling*, the Interim Measures Work Plan indicates that confirmation samples will not be collected from the sidewalls of the excavation. In contrast, the Interim Measures Work Plan in Section 4.5.1 indicates that sidewalls will be sampled for confirmation. Confirmation samples must be collected from the bottom and sides of all excavations at intervals not to exceed 25 feet. This includes any areas excavated to depths of 20 ft. The Permittee can collect sidewall conformation samples ahead of, behind, or through shoring via portholes cut through the shoring. Excavation of contaminated soil at the former Fuel Offloading Rack must be completed by October 6, 2011. **PAGE 6 SECT G**	The Interim Measures Work Plan text in Section 4.5.3.6 will be revised to replace the statement "Because of the use of the slide-rail shoring system, sidewall confirmation samples cannot be collected." The following statement will be added in instead "Confirmation samples will be collected from the excavation sidewalls, ahead of or behind temporary shoring as the excavation progresses. Sidewall samples will be obtained at 25 ft intervals along the length of the excavation at a depth below ground surface equal to half the depth of excavation." Floor confirmation samples will be obtained from the geoprobe cores at the 20 ft depth interval.	As stated in the work plan, with revisions.
16	Piping From Building 1033 to Tanks the entirety of this section is in question **PAGE 6 SECT H**	No changes to the work plan required	Removal of the pipeline from Building 1033 to the tanks will be completed by the USACE under the MILCON contractor. Soil along the pipeline will be sampled once the fuel lines are decommissioned.
17	Nevertheless, NMED has reconsidered its earlier position to expand the number of SVE Units. Instead of expanding the number of operating SVE Units, the Permittee is directed to prepare the locations of existing groundwater monitoring wells KAFB-3411, KAFB-I0614, KAFB-I0624, KAFB-l 0617, KAFB-I0618, and KAFB-l 061 0 for conducting SVE by no later than February 15, 2011. The Permittee is also directed to prepare an SVE Optimization Plan for the four existing SVE Units, with the concept that the four SVE units will be moved periodically between the six aforementioned locations and the four locations where SVE is currently conducted to maximize the removal of contaminants (by mass) via vapor extraction. Furthermore, the Permittee must propose in the SVE Optimization Plan alternative technologies for the removal and treatment of soil-vapor contamination that do not rely on the use of internal combustion engines. The SVE Optimization Plan must be submitted to NMED by March 31, 2011. **PAGE 7 SECT I**	An SVE Optimization Plan will be prepared and submitted to the NMED for review.	An SVE Optimization Plan will be prepared as stated, in which existing wells will be ranked for SVE preparation based on data collected to date and site conditions. The preparation of locations located off-base is dependent on granting of ROE access.

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18	NMED approves the ROI, hydrocarbon baildown, and Pneulog tests. The Permittee shall conduct the Radius of Influence, the Hydrocarbon Baildown, and PneuLog tests by April 6, 2011; March 2,2011; and December 21, 2011, respectively. **PAGE 7 SECT J**	No changes to the work plan required	Clarification requested on the March 2, 2011date listed in letter. The radius of influence testing will be conducted within 60 days of the last SVM well installation in order to maximize the information gained from the test.

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PART 2 REVIEW			
No.	**NMED COMMENT**	**WORK PLAN ACTION**	**RESPONSE TO COMMENT**
SECTION A: DEFICIENCIES IN ALL PLANS			
19	1. Part 1, A.7 of the NOD issued on August 6,2010, required that the Permittee list the data gaps that apply to each of the three plans, as appropriate for the topic of a plan. The Permittee was also instructed to revise the Interim Measures, Groundwater Investigation, and Vadose Zone Work Plans to include a description of at least the data gaps identified by the NMED and point specifically to where in each of the documents the data gaps are addressed. This deficiency was not corrected in any of the revised Work Plans submitted on November 4, 2010. The NMED is directing the Permittee again to revise the Interim Measures, Groundwater Investigation, and Vadose Zone Work Plans to include a description of the data gaps identified by the NMED and point specifically to where the data gaps are addressed in each of the documents. **PAGE 8**	The Groundwater Investigation Work Plan and Vadose Zone Investigations Work Plans will be revised to include the data gaps, including those discussed in the LNAPL Containment Interim Measure Work Plan. Groundwater Data Gaps: 1) Characterize the LNAPL and dissolved-phase in the groundwater (Section 5.2.3 of the Groundwater Investigation Work Plan; Section 5.2.2 of the LNAPL Containment Interim Measure Work Plan) 2) Characterize the vertical extent of the dissolve-phase in the groundwater, the effects of vertical gradients, and the geology of the aquifer depths below the water table (Sections 4.1.3 and 5.2.3 of the Groundwater Investigation Work Plan; Section 5.2.3 of the LNAPL Containment Interim Measure Work Plan) 3) Characterize the leading edge and the eastern and western margins of the plumes (Section 5.2.3 and Figure 3-1 of the Groundwater Investigation Work Plan) Vadose Zone Data Gaps: 1) Determine the amount of fuel that exists within the vadose zone (Section 5.2.11, Table 5-2, and Figure 5-1 of the Vadose Zone Investigation Work Plan; Section 4.5.2 of the Interim Measures Work Plan) 2) Identify the source of the LNAPL fuel plume (Sections 4.5.5 and 4.6.2 of the Interim Measures Work Plan) 3) Characterize the vadose zone hydrology and its relationship to the groundwater (Section 5.2.11, Table 5-2, and Figure 5-1 of the Vadose Zone Investigation Work Plan; Sections 4.6.2 and 4.6.11 of the Interim Measures Work Plan)	The LNAPL Containment Interim Measure Work Plan contains discussions of the identified data gaps. Additional clarification requested regarding the NMED identified data gaps. The Groundwater Investigation and Vadose Zone Investigation Work Plans will be revised as indicated.

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PART 2 REVIEW			
No.	**NMED COMMENT**	**WORK PLAN ACTION**	**RESPONSE TO COMMENT**
SECTION A: DEFICIENCIES IN ALL PLANS (Continued)			
19 (Continued)		4) Characterize the geology and extent of contamination in the soil and soil gas to determine distribution, fate, and migration of contaminants (Sections 5.2.3 and 5.2.4 of the LNAPL Containment Work Plan; Section 6.1 of the Vadose Zone Investigation Work Plan; Sections 4.5.2, 4.6.2, and 4.6.11 of the Interim Measures Work Plan)	
20	2. Part 1, A.9 of the NOD issued on August 6, 2010, required that the Permittee include a site conceptual model encompassing the source area(s), the fuel percolation area, the light nonaqueous phased liquid (LNAPL) plume floating on groundwater, and the dissolved-phase contaminant plume in groundwater in each of the plans. However, none of the revised Work Plans contains a site conceptual model. Instead, the issue was addressed under the Work Plans by stating that a model will be provided later by the Permittee. The NMED is directing the Permittee again to revise the Interim Measures, Groundwater Investigation, and Vadose Zone Work Plans to include a site conceptual model encompassing the source area(s), the fuel percolation area, the light non-aqueous phased liquid (LNAPL) plume floating on groundwater, and the dissolved-phase contaminant plume in groundwater in each of the plans. The model should be illustrated through the liberal use of detailed, accurate, and scaled geologic cross-sections, maps in plan view, and any other necessary graphical representations to clearly and accurately show geologic and hydrologic features, and contaminant levels. NMED invites the Permittee to meet to discuss NMED's expectations with respect to the conceptual model and graphic representation of data. **PAGE 8-9**	No changes to the work plan required.	A tremendous amount of additional data are currently being generated. The CSM will be continuously evolving due to the data collected during the installation of the groundwater and soil vapor monitoring wells. Additionally, geophysical logging of these wells will also be critical to generating a CSM that adequately reflects the site conditions. The required quarterly reports will contain all of the required data, including data tables, plume maps, and cross sections depicting the most current understanding of the site. A site-specific CSM section will be added to every quarterly report, allowing for dynamic updating of the site CSM as information is acquired. A meeting is requested with the NMED to discuss the conceptual site model and graphic representation of data.
21	3. Part 1, A. 10 of the NOD issued on August 6,2010, required that the Permittee meet Section E of the NMED's letter of April 2, 2010, which directed that investigation plans are to include relevant maps and cross-sections that show concentration data for contaminants and other relevant information with supporting data posted on the maps and cross-sections, and clearly show which borings/wells contributed data towards construction of the maps and cross-sections and which did not. Additionally, tables including all existing soil borings, soil-gas monitoring wells, and groundwater monitoring wells, listing their surveyed location, sampling points and maximum depth of exploration were also to be included in the plans. For soil-gas monitoring wells, tables and graphs were also to be included providing trends of TPH concentration versus time for the depths below ground surface of 25, 50, 150, 250, 350, and 450 feet. The required maps, cross-sections, tables, and graphs were not included in the Work Plans submitted November 4, 201 0. Revise the Work Plans accordingly. **PAGE 9**	No changes to the work plan required.	The quarterly reports that will be submitted will contain the requested information, including tables of existing soil borings, soil-gas monitoring wells, existing groundwater monitoring wells, and sample locations, cross sections, plume maps. In addition, a site conceptual model section will be added to the report. This will result in a dynamic and up to date reporting of the CSM each quarter.

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PART 2 REVIEW			
No.	**NMED COMMENT**	**WORK PLAN ACTION**	**RESPONSE TO COMMENT**
SECTION A: DEFICIENCIES IN ALL PLANS (Continued)			
22	4. Appendix E, Uniform *Federal Policy-Quality Assurance Project Plan* - This plan is incorporated into the Vadose Zone Investigation, Groundwater Investigation, and Interim Measures Work Plans. The plan, as written, appears to be a combination of many types of plans, such as project management, training, data validation, quality assurance, and sampling and analysis plans. Additionally, much of the information presented appears to be overly burdensome and not particularly useful in the present format. For example, a tabulated listing of field quality control samples to be collected for every quarter/year is unnecessary as the types and frequencies of such samples are not likely to change every quarter or even every year. Listings of quality control targets (in particular, limits for laboratory control samples) from three different entities are also not useful - instead only those that will actually be used for this particular project should be listed. The Permittee must revise Appendix E into multiple appendices to separate the various types of plans (e.g. project management, training, data validation, quality assurance, and sampling and analysis). The various listings of laboratory analytes per media (QAPP Worksheet # 1 Sa-c), field quality control samples (QAPP Worksheet # 20a-c), quality control targets (Appendix A of Appendix E) should be revised to simplify the information presented and contain only the necessary information to support the Bulk Fuels Facility Spill project. Some tables, such as QAPP Worksheets # 3, 4, 9, 16, 24c, 25, 2Sa-d, do not provide useful information to the NMED and should be deleted. NMED is expecting a Quality Assurance (QA) Plan that contains specific quality assurance and quality control activities for the Bulk Fuels Facility Spill project. The QA plan is to integrate all technical and quality aspects of the project to ensure that the necessary type and quality of data are obtained to adequately characterize the release, the contaminated media, and for conducting and verifying clean up. NMED invites the Permittee to meet and discuss NMED's expectation Col. Maness and Mr. Pike December 10, 2010 Page 10 with respect to what should be in the QA Plan, as well as project management, training, data validation, and sampling and analysis plans. **PAGE 9-10**	A Quality Assurance Project Plan (QAPjP) will be developed and submitted.	Per the 6 January 2011 meeting with the NMED, a project specific plan will be developed in accordance with the requirements presented by the NMED during the meeting. This Quality Assurance Project Plan (QAPjP) will replace the current UFP-QAPP in the work plans.
SECTION B: GROUNDWATER INVESTIGATION WORK PLAN			
23	1. The Permittee must describe in the first paragraph of Section 5.2.5 what geophysical logging has been previously conducted at existing wells. **PAGE 10**	The first paragraph of Section 5.2.5 of the Groundwater Investigation Work Plan will be revised to include the following statement: "Geophysical borehole logging of the 29 existing groundwater monitoring wells was conducted in December 2010. This data has been posted to the data portal."	Geophysical logging of existing wells was completed on 21 December 2010.

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SECTION B: GROUNDWATER INVESTIGATION WORK PLAN (Continued)			
24	2. The last paragraph on page 5-19, Section 5.2.5.1, states "The logs will be run from the groundwater table (approximately 500 ft bgs) to ground surface through the well casing." Correct the text to read "The logs will be run from the bottom of the well to the ground surface." Also, change all references to "groundwater table" in the Groundwater Investigation Work Plan to the correct term "water table". **PAGE 10**	The second paragraph of Section 5.2.5.1 will be revised to read "The logs will be run from the bottom of the well to the ground surface through the well casing." The global change of "groundwater table" to "water table" will be made throughout the Groundwater Investigation Work Plan.	Revise as required
25	3. The first sentence on page 5-20, Section 5.2.5.1, references a proposed seismic survey. Discuss the survey, or remove the reference to the seismic survey if such a survey will not be conducted. **PAGE 10**	The last sentence of the second paragraph in Section 5.2.5.1 will be revised to remove the reference to seismic survey.	Revise as indicated
26	4. Section 5.2.5.2, *Induction Logging*, on page 5-22, 3rd paragraph, 1 S\ sentence states: "The borehole induction system can be used in boreholes that range from 2 to 8 inches diameter without significant borehole effects." Because the Permittee is proposing to drill boreholes with diameters of 9-5/8 and 11-3/4 inches, indicate whether the borehole induction system can be used properly in boreholes with diameters greater than 8 inches, or modify the plan to indicate that another, more appropriate tool will be used to log the boreholes. **PAGE 10**	The three sections on the loggings tools will be modified to present the capabilities of the tools with increased clarity. The three sections on the loggings tools will be revised to present the capabilities of the tools with increased clarity. **5.2.5 Borehole Geophysical Investigation** Borehole geophysics, consisting of induction, neutron, and gamma logging, will be conducted on 29 existing monitoring wells and the 28 new monitoring wells to be installed as described in this work plan. The deepest well installed at each of the 28 well clusters will be logged. Geophysical logging will aid in fully characterizing subsurface stratigraphy and the nature and extent of vadose zone and groundwater contamination. The ultimate goal of geophysical borehole logging investigations is to use the data to refine the CSM of the potential source location(s) and the extent of the LNAPL contamination, in order to optimize placement of remedial SVE and groundwater extraction wells and potential future monitoring wells. For this objective, it is expected that the characterization of the fine-grained clay and silt units in the vadose zone will be mapped with a vertical accuracy of less than 1 ft.	The borehole diameter of 2-8 inches was based on the anticipated use of the Geonics EM39 induction probe, which has an intercoil spacing of 20 inches. The probe actually used for the project is an induction probe that utilizes two intercoil spacing's of 20 and 33 inches. The larger intercoil spacing of 33 inches will provide information on the conductivity of the uninvaded zone (90 % of the cumulative instrument response will come from a radial distance of more than 8 inches).

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26 (Continued)		Borehole logging will follow standard industry practices such as those presented in the ASTM 5753 *(Standard Guide for Planning Borehole Geophysical Logging)*, ASTM D 6274 (*Standard Guide for Conducting Borehole Geophysical Logging – Gamma)*, ASTM D 6127 (*Standard Guide for Conducting Borehole Geophysical Logging: Neutron)*, and ASTM D 6726 (*Standard Guide for Conducting Borehole Geophysical Logging: Electromagnetic Induction).* ***5.2.5.1 Downhole Geophysical Logging*** Geophysical techniques have proven to be valuable tools in determining lithology, porosity, and moisture condition of various stratigraphic units. Downhole geophysical logging will be conducted using a suite of logs to include medium and deep induction, neutron, and natural gamma (large crystal) tools. The objective of this effort is to characterize the fine-grained clay and silt units in the vadose zone with a vertical accuracy of less than 1 ft. The logs will be run from the groundwater table (approximately 500 ft bgs) to ground surface through PVC well casing. Equipment will be decontaminated at each well location before conducting logging activities. All logging equipment will be calibrated in accordance with manufacturer's specifications. "Shop" calibrations will be performed within 30 days of the logging event. During the first mobilization operations will be confined to KAFB and before and after calibrations will be conducted for each logging tool at each well. During the second mobilization operations will occur in the neighborhoods surrounding KAFB. Due to the interferences anticipated in this cultural setting (e.g., nulling the induction probe near large metal objects, power line interference, etc.) and safety factors	

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26 (Continued)		associated with the neutron probe radioactive source, tool calibrations may be performed at a calibration site within the KAFB boundaries prior to and at the conclusion of each day's activities. The Induction probe will be run free in casing during logging activities, and the neutron probe will be "sidewalled" using a bow spring or mechanical arm. This information will be recorded on the Shaw wireline logging summary sheet for each well. A minimum of 100 ft of repeat log will be performed after the initial logging effort and the initial and repeat logs will be provided to the Shaw representative in hardcopy form for review. After completion of the borehole, a paper copy of the strip logs will be provided to the Shaw representative for review and approval. Digital data files for all logs also will be provided by the logging contractor at the end of the field day. Geophysical logs will show results of induction logging (medium and deep) in ohm meters, neutron logging in American Petroleum Institute (API) neutron units, and gamma logging in API-calibrated counts per second. The results of each method will be plotted versus depth from the surface to total depth of the borehole for which the log represents. The name of the borehole, location of the borehole, the date(s) that the borehole was completed, the drilling method, after survey depth error (ASDE), and the elevation of the top of the borehole will also be noted in the boring log. Data will be provided to the Shaw representative in hard copy and in digital format. The logs will be evaluated /interpreted along with soil boring logs, well construction reports, and previous geophysical logs acquired in the surrounding area.	

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26 (Continued)		***5.2.5.2 Induction Logging*** EM-induction logs record the electrical conductivity (inverse of resistivity) of the materials surrounding the borehole. The conductivity is dependent on the porosity, permeability, type of material, moisture content, and total dissolved-solids (TDS) concentration of the water within the unconsolidated materials or rocks. Electromagnetic (EM) induction logging provides detailed stratigraphic information from dry, cased (PVC), or uncased holes. A small transmitter coil in the borehole probe induces eddy currents in the surrounding geologic material. The eddy currents generate a secondary magnetic field in the geologic materials. The strength of the magnetic field is controlled by the electrical properties of both geologic materials and groundwater. A receiver coil in the borehole measures the strength of the quadrature component of the secondary magnetic field, and electronics in the instrument console convert the magnetic field strength to values of conductivity. Approximately 90 % of the tool response from the deep induction log occurs at distances greater than 8 inches from the borehole (ASTM D 6726). Consequently, borehole effects are minimized and the measured electrical conductivity responds to the "true" formation conductivity. Drift and noise are typically less than 1 millisiemen (mS) per meter and conductivity changes of a few percent can be resolved. The intercoil spacing resolves conductivity layers that are approximately 22 inches thick. The system may detect layers that are thinner than 22 inches; however, the measured value is the product of conductivity contrast multiplied by layer thickness.	

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26 (Continued)		The dual focused induction probe proposed for use is 1.7 inches in diameter and 9 ft in length and provides two conductivity measurements at 25.6 Khz frequency corresponding to "medium" and "deep" radii of investigation. ***5.2.5.3 Gamma Logging*** Gamma logs detect the amount of natural gamma radiation emitted by the rocks surrounding the borehole. Naturally occurring radiation comes from three principal areas: potassium-40, which occurs with all potassium minerals; uranium-238; and thorium-232, which is associated primarily with biotite. Clayey and shaley rocks typically have higher gamma radiation due to their composition of the weathering products of potassium feldspar and mica. The natural gamma tool is used for general lithologic identification and stratigraphic correlation. The typical radius of investigation for the natural gamma log is approximately 10 to 12 inches from the borehole wall. The natural gamma probe utilizes a sodium-iodide, thallium-activated crystal to measure gamma-ray emissions from soil or rock. The method can be used in uncased, steel-cased, or PVC-cased and continuously measures, in counts per second, gamma-rays emitted primarily from uranium, potassium-40, and thorium. The natural gamma crystal will be integrated with the induction and neutron probes for the first mobilization. The natural gamma crystal will be integrated with the neutron probe for the second mobilization. A calibration certificate for the gamma will be provided by the logging contractor.	

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26 (Continued)		***5.2.5.4 Neutron Logging*** Neutron logging uses an active radioactive source to identify porous formations and lithology. The tool is also used to identify water saturation in vadose zones. Neutron logs map the apparent porosity of the materials surrounding the borehole by emitting high energy neutrons. The neutron measurement is a single function radiation probe that detects thermal neutrons using a He-3 detector. An americium-241 (beryllium-activated, americium-beryllium-241 [AmBe-241]) neutron source emits high energy (fast) neutrons into the formation. These neutrons diffuse through the formation and collide with the atoms present. Collisions with atoms nearest the mass of neutrons, such as hydrogen, result in an exchange of energy. Thus, these neutrons are slowed down to thermal energies which can be detected by the He-3 detector. Since slowing is primarily due to collisions with hydrogen, neutron count rates represent the hydrogen content of the formation and can be interpreted in terms of porosity. The tool used during the first mobilization will use two different source-detector spacings (near and far). For the second mobilization, a single He3 detector will be used that is located 16 inches above the neutron source. The probe used for the second mobilization is 1.7 inches in diameter and 6.9 ft in length. The necessary containers and safeguards for the transportation, storage, and use of nuclear source(s) will be provided. The operator will be properly trained, certified, and maintain the required licenses to handle nuclear source(s). Work will complete with all federal and state requirements for the use of active-source tools.	

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27	5. Section 5.2.5.2, *Induction Logging,* page 5-22, the last sentence of the 3rd paragraph states; "The maximum depth of measurement for the most induction logging systems is 650 ft (200) meters)." Explain what this sentence means, as wells many thousands of feet deep are logged using induction logging. If the sentence is incorrect, correct the sentence or delete it from the Work Plan. **PAGE 10**	The sentence, "The maximum depth of measurement for the most induction logging systems is 650 ft (200 meters)" will be deleted from the work plans. The text in Section 5.2.5.2 will be modified to read: "A Mount Sopris MGX digital logger (or equivalent) will be used. This facilitates interchanging probes, as well as allowing the data to be collected on a DOS-based field notebook as the winch raises and lowers the probe. The logging system will be equipped with a 0.1-0.125-inch steel conductor cable long enough to log the wells of interest."	Revise as indicated.
28	6. The last paragraph and bullets in Section 5.2.5.2, *Induction Logging,* discusses general procedures for all geophysical logging. This discussion needs to be moved to a more general section, such as Section 5.2.5 *Logging Requirements.* Also: a. Add total depth from the logger to the list of bullets. b. Add the same information to the list of bullets that is to be recorded in the first bullet of Section 5.2.3.2 of the Vadose Zone Investigation Work Plan (e.g., logging tool serial number, sensitivity range setting). c. The Permittee must include the measured deviation between the "zero point" of the tool at ground level at the start of the logging run and after completing the logging run. **PAGE 10**	The specified section will be moved to Section 5.2.5. a) The total logging depth will be added to the list. b) The same information will be added to the list of bullets in Section 5.2.3.2 of the Vadose Zone Investigation Work Plan. c) The after survey depth error (ASDE) tolerance will be added to Section 5.2.3.6, *Logging Requirements* Section 5.2.6 will be modified as follows: **5.2.6 Logging System and Requirements** A general procedure for the information recorded for a borehole geophysics survey will include recording all information necessary to correctly interpret the log, including: • Project number • Well identification number • Well completion information • Location of the zero-depth of the log, which may be the top of the casing, ground level, or some other specified point	Revise as indicated.

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28 (Continued)		• Height of the top of the casing aboveground level • Depth of the bottom of the casing(s) and screen interval • Total depth geophysically logged • Total depth drilled ***5.2.6.1 Logging System*** A Mount Sopris MGX digital logger (or equivalent) will be used. This facilitates interchanging probes as well as allowing the data to be collected on a DOS-based field notebook as the winch raises and lowers the probe. The logging system will be equipped with a 0.1- or 0.125-inch steel, armored, single conductor cable long enough to log the wells of interest. ***5.2.6.2 Pre-Logging Requirements*** Pre-logging activities include drilling, as necessary, and mobilization of the logging unit by the logging contractor to the borehole locations. The following are basic pre-logging requirements: • Boring logs will be prepared for each borehole during drilling for field comparison with the wireline logs. Zones of extensive circulation, lost circulation, suspected washouts, or drilling problems will be noted for anticipation of possible log response. • Hole deviations will be recorded on the appropriate form(s) if directional surveys were run. • A wireline logging summary will be filled out for each borehole. Information such as the tool, logging speed, repeat interval, depth reference, start and end time, calibration information, etc. will be	

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28 (Continued)		recorded. . A tool status report will be onsite for all tools plus spares. • All logging equipment will be properly decontaminated before arrival onsite, between wells, and before leaving the site. The equipment will be decontaminated according to Section 5.4 of this work plan. • For logging in cased holes, a "dummy" tool of the same dimensions may be used to ensure the working tool does not stick in the hole. This is especially useful for small-diameter PVC casing, which may flex when it is set in the borehole. Logging Requirements The general borehole geophysical logging process consists of the following: 1. After mobilization to the borehole and decontamination of the equipment, the contractor connects the first tool to the logging cable. 2. The contractor conducts the "before" logging calibration check at the well or another pre-approved location at the start of the day to ensure the instrumentation is functioning properly. The calibration results are checked to ensure that they meet the required tolerances. 3. The tool is placed in the hole and adjusted to "zero" depth at a pre-defined depth reference (e.g., top of casing). The contractor checks to ensure that all equipment is still functioning properly and then lowers the logging tool into the borehole. 4. While the tool is lowered to the bottom of the hole, the logging tool response is monitored by the logging engineer. 5. Once the tool is at the bottom of the hole a final check is completed (instrument settings, logging scales, total depth, etc.). Logging is commenced up the hole at the proper speed (re: logging contractor	

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28 (Continued)		SOPs) and data are digitally recorded. The logging speed and sample interval are documented on the wireline summary sheet and log header for each well. 6. Once the upwards logging run is completed, the tool is placed back in the hole at a specified interval to collect a repeat section for QC purposes. 7. Field copies of all logs are generated. The original and repeat log sections are checked for overall quality and repeatability. 8. Post-logging calibration checks are performed at the well site or at the end of the day. 9. If data are collected with another tool, the process above is repeated. If not, the logging unit and associated tools and equipment are decontaminated and prepared for transfer to the next borehole. The following required items are necessary for effective implementation of the logging process and generation of useful logs of appropriate quality: • The pullout strength of the cable socket, which connects the tool to the cable, will be known before entry into the hole. • Calibration procedures, both in the shop and in the field, must be performed. The time and results of the last shop calibration for each tool will be documented. • Field calibrations are performed prior to and after logging and recorded on the wireline logging summary sheet. • When logging tools are run in combination, all curves are referenced to the same depth reference point (e.g., top of casing or ground level). • Depth control will be used for each logging run. This is accomplished by placing the tool reference point at a	

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28 (Continued)		known point (e.g., top of casing) and using that location as the "zero" reference for the logging run. • The after survey depth error (ASDE) metric for the project will be 0.4 % of the logged depth between the start and end of a logging run where the tool is referenced to a zero depth at a pre-defined point prior to and at the end of the logging sequence. The proposed ASDE is based on the current ASTM standards and will ensure the logging data are of sufficient quality to meet the project objectives. The ASDE is documented on the log header for each well. • Ensure the driller drills a rat hole deep enough so as to provide enough depth for the log's first valid readings to be in the sand or gravel at the bottom of the well. • Repeat sections will be run for all logs. The repeat sections will be selected based on zones of interest and will be a minimum of 100 ft in length. Attention to detail during borehole geophysical logging, including equipment setup, calibration, and monitoring, is required for obtaining accurate and reliable data. Borehole geophysical logs are subject to a number of potential tool problems and operational errors. A Shaw QC representative will be present during the entire logging operation to provide oversight of the logging process. The Shaw QC representative will independently document the logging activities to ensure the data are of sufficient quantity and quality to meet the project objectives. Any and all problems (including tool malfunction and significant downtime) and associated corrective actions will be recorded by the Shaw QC representative on the appropriate form(s) according to the project work plans.	

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28 (Continued)		Field copies of all logs will be provided to the Shaw QC representative at the end of each logging run . The QC representative will review the log and check the data for overall quality and repeatability (e.g., noise spikes, depth reference, drift of the EM log, etc,) Any potential quality issues will be brought to the attention of the contractor and resolved prior to demobilization form the site. For the field logs (and final logs [see below]), all off-scale readings, drift adjustments, and first curve readings will be marked on the logs, and all curves identified and labeled. All post-logging field calibrations must be run for each tool and recorded on the log tails or headers. These will be checked with the pre-log calibrations, noting any changes. A wireline logging summary sheet will be completed for each borehole. Header information will be thoroughly filled out, including equipment and calibration date. The type, temperature, and resistivity of any fluids and other associated measured parameters will be recorded, as applicable. Any unusual conditions, problems, or concerns regarding the logging run are to be included in the remarks section. Logging speeds, time constants, and tool model will be correctly recorded. The digital data for the original, repeat, and tool calibrations are digitally recorded and will be maintained as part of the official project record. The logs will be completed to the satisfaction of the Shaw QC representative before the logging contractor is allowed to rig down. Final approval for acceptance of the quality of the log will rest with the QC representative and project manager. ***5.2.6.3 Post-Logging Requirements*** A predetermined number of final log prints will be provided within 2 weeks of completing	

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28 (Continued)		the final logging run including the final composite logs. Any and all information required for entry on the field logs above will be included on the final log prints. In addition to the hardcopy logs, raw and final processed digital data will be delivered within two weeks of project completion.	
29	7. Describe in Section 5.2.5.1 of the Work Plan if tools are to be run centralized, decentralized, or free in casing and describe where that information will be recorded. **PAGE 10**	The following paragraph will be added to Section5.2.5.1 of the work plan: "The Induction probe will be centralized in the well during logging activities with a fin assembly and the neutron probe will be decentralized using a bow spring. This information will be recorded on the Shaw wireline logging summary sheet for each well logged."	Revise as indicated.
30	8. Section 5.2.6.1, Logging System, p.5-25, last sentence, states "The logging system will be equipped with .... cable long enough to log 600-ft.depths." Because some of the groundwater monitoring wells may be 610-620 ft deep, the logging system must be capable of logging the full depth of all wells, even those in excess of 600 ft depth. **PAGE 11**	The text in Section 5.2.6.1 will be modified to read: "A Mount Sopris MGX digital logger (or equivalent) will be used. This facilitates interchanging probes, as well as allowing the data to be collected on a DOS-based field notebook as the winch raises and lowers the probe. The logging system will be equipped with a 0.1-0.125-inch steel conductor cable long enough to log the wells of interest."	Revise as indicated.
31	9. Table 4-1, Data Quality Objectives Summary Table, in the 3rd and 4th column in row 4, *Define the Study Boundary* states "Study boundaries are indicated on Figure 2-1". Many wells are outside the study boundary shown on the figure. Correct the statement or the figure as appropriate. Revise Table 4-1 in accordance with the directives in this letter, or delete the table. Although the Permittee may use the EPA's DQO process to plan work, NMED prefers that Table 4-1 and Section 4 be deleted from the Work Plan, as they add little additional useful information. Items in the table should be included in the text of the Work Plan with additional details and as modified in accordance with the directives of this letter. **PAGE 11**	Figure 2-1 will be revised to include the study boundary. Section 4.0 and Table 4-1 will be deleted from the revised work plan.	Revise as required

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32	10. Table 4-1, Data Quality Objectives Summary Table, in the 3rd and 4th column in row 6, *Specify Limits on Decision Errors* states "Borehole geophysics measurements obtained is less than 1 ft." Explain what this sentence means, especially in light of the second sentence in Section 5.2.5.2 on page 5-22, which states "The intercoil spacing resolves conductivity layers 20 inches thick." See comment # 9 above about the deletion of Table 4-1 and Section 4. **PAGE 11**	Table 4-1 will be deleted from the revised work plan. The statement that "borehole geophysics measurements obtained is less than 1 ft" refers to the after survey depth error for a 250 ft borehole depth and does not account for longer distances that may be traveled by the logging tool for wells that exceed 250 ft in depth. Section 5.2.5 will be revised to include the following clarification: "The after survey depth error (ASDE) metric for the project will be 0.2% of the total distance the logging tool travels between the start and the end of a logging run where the tool is referenced to a zero depth at a pre-defined point prior to and at the end of the logging sequence. This ASDE is consistent with industry standards and will ensure the logging data are of sufficient quality to meet the project objectives."	Revise as required
33	11. Section 5.2.7, *Borehole Geophysics Equipment Decontamination* - Revise the Work Plan to indicate clearly that both the cable and probe will be decontaminated. **PAGE 11**	The first sentence of Section 5.2.7 will be revised to read "All downhole logging equipment and materials, including the cable and probe, will require decontamination before use, between each borehole, and before demobilization."	Revise as required
34	12. The 2nd paragraph, last sentence of the *Preface* states "Part II will consist of the evaluation of all existing and new data, and development of the risk assessment (including the conceptual site model), and the Groundwater Investigation Report (including cross sections and plan views)." Revise the Work Plan to include a detailed description of what is to be included in the Part II Work Plan. NMED notes further that the inclusion of a "report" in a work plan is unusual and generally inappropriate. Information derived from newly completed work is normally submitted as a stand alone report, not as a section of a work plan. Furthermore, the schedule in Appendix B lists the Part II Work Plans as being submitted by August 6,2011. Because the contents of the Phase II plans are unknown to the NMED, the NMED can not agree to this submittal due date. **PAGE 11**	No changes to the work plan required	All of the data/maps/cross sections/trends will be included in the quarterly reports. A CSM section will be added to the quarterly report and updated for each submission. The risk assessment will be developed following the collection of needed data. This report will be submitted concurrently with the Investigation Report.

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35	13. There are few details of reporting in the Work Plan, and most of those are aimed at the geophysical logging. Revise the Work Plan to include details for reporting on well installation, monitoring, and sampling results. **PAGE 12**	The work plan will be revised to include the following statement: "Reporting will be included in each quarterly report. All new borings, data, etc., will be included in the report. The CSM will be updated in each quarterly report." The Pre-Remedy Work Plan contains reporting requirements for the monitoring and sample results.	Reporting will be included in each quarterly report. All new borings, data etc. will be included in the report. The CSM will be updated in each quarterly report.
36	14. Section 3.5.3, *Identification of Contaminants of Potential Concern,* page 3-10 lists WQCC water quality standards from 20.6.2 NMAC. The cleanup levels for groundwater shall be the New Mexico Water Quality Control Commission (WQCC) water quality standards (20.6.2.3103 and 20.6.2.4103 NMAC) and the drinking water maximum contaminant levels (MCLs) adopted by EPA under the Federal Safe Drinking Water Act (42 U.S.C. §§ 300fto 300j-26). If both a WQCC standard and a MCL have been established for a contaminant, then the most stringent of the two levels shall be the cleanup level for that contaminant. If a WQCC standard or MCL has not been established for a contaminant, the EPA Regional Screening Level (RSL) (EPA, 2009) for tap water shall be used as the cleanup level. If a RSL for tap water does not exist for a contaminant, and toxicological information is available, the Permittee shall propose a cleanup level based on a residential scenario, a total target human health excess cancer risk level of 10-5 and for non-carcinogenic contaminants a HQ of one (1.0). Revise the Work Plan accordingly. **PAGE 12**	The work plan will be revised to include the statement: Section 3.5.3 is a preliminary assessment of COPCs for the project site. A final list of COPCs will be determined in the Risk Assessment and presented in the final report."	This section was simply a preliminary listing of COPCs which will be finalized in the Risk Assessment. Identification of ARARs, RAOs and cleanup levels will be finalized in the CMS.
37	15. Section 3.5.4, *Light Non-Aqueous Phase Liquid Distribution,* contains a list of wells where LNAPL has been detected. Add well KAFB-I0628 to the list. **PAGE 12**	The work plan will be revised to include KAFB-10628 in the list of wells where LNAPL has been detected. The text will also be revised to include the statement that well KAFB-10628 had 0.8 ft of LNAPL.	Revise as required
38	16. Section 5.2.3.1, page 5-6, 3rd bullet, discusses a scale of 1 inch = 10 feet for drilling logs for wells shallower than 200 feet, but does not address a scale for wells greater than 200 feet. Because all wells are likely to be greater than 200 feet deep, identify the scale to be used. **PAGE 12**	The work plan will be revised to indicate that a scale of 1 inch = 5 feet will be used for drilling logs for wells greater than 200 ft.	Revise as required
39	17. Section 5.2.4, Groundwater Monitoring Wells, page 5-14, 2nd paragraph, last sentence states "A schematic showing a well construction detail is included in Appendix D, Forms 4,5,6, and 7." None of the four forms seems to fit the proposed construction details with a single cased, telescoped borehole, as shown on Figure 5-1. Revise the Work Plan to include appropriate well construction field forms. **PAGE 12**	Appendix D will be revised to include a schematic for the well construction of a single cased, telescoped borehole.	Revise as required

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40	18. Section 5.2.4.3, *Well Development,* 2nd bullet discusses stabilization of groundwater field parameters during well development. Water stability indicators must be as described in the Permit, not as listed in this section, or as listed in Appendix D. Form 8, *Well Development Record and Water Quality Field Data Sheet (Continued* 5 *of6).* **PAGE 12**	The text in the second bullet of Section 5.2.4.3 of the work plan will be revised to read: "Following initial development, the well will be continuously pumped using an electric submersible or pneumatic, drive positive-displacement or bladder pump. Temperature, pH, specific conductivity, and turbidity will be monitored during pumping, and readings will be taken after every well casing volume is purged. At a minimum, the well will be developed until the column of water in each well is free of visible sediment, and the pH, temperature, conductivity, turbidity, and specific conductance have stabilized within 10%. If these parameters have not stabilized after 4 hours of continuous pumping, the well will be allowed to site overnight and development will continue the following day for a maximum of two hours."	Revise as indicated
41	19. Appendix D. Form 8, *Well Development Record and Water Quality Field Data Sheet (Continued* 5 *of* 6) lists conversion factors to determine the volume of well water to be purged for development and sampling based upon the height of the water column in the well. A distinction is made between a dedicated and non-dedicated system. NMED does not recognize such a distinction and requires that all well development meet Permit Part 6.5.17.10.6 and that well purging be conducted as directed in NMED's letter of June 4,2010, and Permit Part 6.5.17.4. **PAGE 12-13**	Form 8 of Appendix D will be revised to remove the reference to dedicated and non-dedicated systems.	Revise as indicated
42	20. Appendix C, *Waste Management Plan,* Table 2 implies that the preferred method of disposal of non-hazardous waste water, a form of investigation-derived waste (IDW), is to discharge it to the ground surface. NMED encourages the Permittee to dispose such nonhazardous waste water into the City of Albuquerque's Publically-Owned Treatment Works (POTW) sewer system. Furthermore, all such water must be containerized and tested prior to disposal in accordance with 20.4.1.300 NMAC incorporating 40 CPR § 262.11. Waste water from one well can not be commingled with that from any other well or wells unless demonstrated not to be a hazardous waste. **PAGE 13**	The work plan will be revised to describe the methodology for handling the disposal of non-hazardous waste water.	The NMED Groundwater Quality Bureau has been contacted for the preferred method to manage IDW non-hazardous waste water. The decision tree is attached.

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SECTION B: GROUNDWATER INVESTIGATION WORK PLAN (Continued)			
43	21. The Permittee shall address the following concerning Appendix E, *Uniform Federal Policy-Quality Assurance Project Plan*. **a)** Appendix E is shown as "(Pending Review)". This suggests that Appendix E is a draft document. Revise the Work Plan to contain only finished products, ready for NMED review. **b)** Appendix E, page 77, Section 17.2, first paragraph, correct" April 2009" to the appropriate date. **c)** Appendix E, page 77, Section 17.2 must clearly state quarterly groundwater monitoring will occur until a change is approved by NMED. **d)** Describe what risk evaluation the Permittee is expecting to do and why. **e)** List the data quality objectives that the QAPP must address. **f)** Describe the Quality Assurance for geophysical logging. **g)** Appendix E, Section 17.5 (and elsewhere) - Samples must be analyzed at an EPA certified laboratory. Also, the Permittee must indicate whether the referenced Department of Defense Environmental Laboratory Accreditation Program (DoD ELAP) laboratory is EPA certified. Revise the Work Plan accordingly. **h)** Appendix E, Section 17.8, *Investigation-Derived Waste* -This section needs to clearly state that no IDW water from individual wells will be comingled before appropriate testing. **i)** Appendix E, Section 17.9.4 states that no trip blanks will be collected for soil samples for VOC analysis. Revise the Work Plan to indicate that trip blanks are required for soil samples that are to be analyzed for VOCs. **j)** Appendix E, Section 17.9 must include percent frequency of field quality control samples in each subsection. The sampling frequency must be as described in Permit 6.5.17.6. **k)** Appendix E, Section 17.9.5, states field (ambient) blanks will be collected for groundwater only. Revise the Work Plan to include field blanks for soil sampling. **l)** Appendix E mainly addresses sampling only for laboratory and field analyses. Other field activities, such as surveying and geophysical logging need to be addressed. **m)** Appendix E, Section 17.2.2, *MNA Groundwater Monitoring*, states "30 groundwater monitoring wells will be installed for the monitored natural attenuation (MNA) investigation effort." Specify which wells these are and the purpose of this monitoring given that NMED has not made any decision concerning MNA as a remedy. Additionally, Section 11.2 of Appendix E, indicates that there are 35 wells to be included in the study. Specify which number of wells is correct. **PAGE 13-14**	A QAPjP will be developed and submitted with the resubmission of the work plans.	Per the 6 January 2011 meeting with the NMED, a project specific plan will be developed in accordance with the requirements presented by the NMED during the meeting. This Quality Assurance Project Plan (QAPjP) will replace the current UFP-QAPP in the work plans.
44	22. Revise the Work Plan to provide for the collection and maintenance of representative soil samples encountered during well installations and to indicate that said samples will be made available for NMED inspection upon request by the NMED. Additionally, Section 11.2 of Appendix E indicates that there are 35 wells to be included in the study. Specify which number of wells is correct. **PAGE 14**	Chip trays are being utilized at each deep groundwater monitoring well location and each soil-vapor monitoring boring to collect representative soil samples during well installation. The chip trays are archived at the project trailer and are available for inspection upon request. The work plan will be edited to indicate that chip trays will be used for representative soil sample collection. Section 11.2 of Appendix E will be revised to clarify that there are 78 wells associated with the groundwater investigation.	Revise as indicated

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45	23. Revise the Work Plan to specify the frequency that soil samples will be tested for grain size via sieve analysis. Indicate the specific sieve screen sizes that will be utilized for the testing. **PAGE 14**	The work plan will be revised with the following paragraph: "Samples for grain size analysis will be collected continuous split-spoon samples taken at eight separate, deep groundwater wells. Samples will be collected to capture gravel, coarse-grained sand, medium-grained sand, fine-grained sand, silty sand, and silt. One sample from each grain size type observed in the continuous split-spoon samples will be collected for analysis. Shaw will use the laser grain-size analysis method (ASTM D422/D4464M) that ranges in size from gravel down to clay-size particles. This method uses 34 grain-size categories ranging in size from 0.25 inches down to 0.000015 inches"	The work plan will be revised to be consistent with the PTS, the subcontracted geotechnical laboratory, test program.
46	24. Table 6-2 lists only two soil samples each to be collected for grain size, residual LNAPL saturation, Water/LNAPL Drainage Capillary Pressure and Water LNAPL Relative Permeability and only one LNAPL sample each for testing for viscosity, fluid density and surface and interfacial tension. Revise the Work Plan to describe why these few numbers of samples are sufficient for the range of conditions at the site. Also, clarify in the table if the column titled "No. of Field Samples" is correct, and if the column "Total No. of Samples to Laboratory" is correct. **PAGE 14**	The work plan text and Table 6-1 will be revised to be consistent with the PTS, the subcontracted geotechnical laboratory, test program. Text will be edited to reflect that there will be eight capillary curve/grain-size tests from gravel, coarse-grained sand, medium-grained sand, fine-grained sand, silty sand, and silt samples. Additionally, the text edits will discuss the physical and chemical properties testing that will be conducted on four LNAPL liquid samples. The physical testing will include density, viscosity, interfacial tension, and flashpoint. The chemical properties testing will be conducted on six LNAPL samples and will be PIANO (Paraffins, Isoparaffins, Aromatics, Nathenes, and Olefins), plus BTEX, EDC, EDB, and oxygenate analyses.	Revise as indicated

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47	25. Saturated hydraulic conductivity and porosity are important variables in groundwater flow considerations. Specify field or laboratory tests that will be conducted to arrive at a range of site specific values. Revise the Work Plan to indicate how values for saturated hydraulic conductivity and porosity will be assessed. **PAGE 14**	Hydraulic conductivity and porosity will be estimated from slug and pump testing. The following language will be added to the work plan to clarify how this information will be obtained: "The hydraulic conductivity and porosity of the aquifer data gap will be addressed initially with slug testing of six groundwater monitoring wells and ultimately by pumping tests of the two extraction wells and one injection well proposed in the LNAPL Containment Interim Measure Work Plan (Section 5.2 of the LNAPL Containment Interim Measure Work Plan).	Collection of saturated hydraulic conductivity and porosity data is included in the LNAPL Interim Measures Work Plan, submitted on December 7, 2010. Text for the relevant sections (Sections 5.2.2 and 6.2.2) has been included as ATTACHMENT A to this document.

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SECTION C: VADOSE ZONE INVESTIGATION WORK PLAN			
48	1. Geophysics - Revise the Vadose Zone Investigation Work Plan in accordance with the above Comments 1-8 and 10-11 concerning Groundwater Investigation Work Plan. **PAGE 14**	The work plan will be revised in accordance with the responses to Comments 1-8 and 10-11 for the Groundwater Investigation Work Plan.	Revise as indicated
49	2. Geophysical logging is proposed in soil-gas wells with 2-inch casing. Confirm that all tools fit in 2-inch casing, given the neutron probe is described as being 60 mm in diameter (2.36 inches, see page 5-24 of the Groundwater Investigation Work Plan, first paragraph, last sentence)or make an appropriate change in tool size or casing size. **PAGE 14**	The work plan will be revised to indicate that 3-inch PVC casing will be used for the deep (450-ft interval) to allow for adequate spacing for the geophysical logging tools.	Revise as indicated
50	3. For the soil vapor wells, describe where the 2-inch casing will be located in the borehole (e.g., in the center, closer to one side), and if so, how geophysical logging conducted in the 2-inch casing could be affected by the other soil-vapor monitoring points attached to 0.75-inch diameter casing in the same nested borehole. **PAGE 15**	The work plan will be revised to clarify that the 3-inch well casing will be placed in the center of the well completion. The work plan will also be edited to include a discussion of potential interference of the surrounding wells in the soil vapor well nests.	Revise as indicated
51	4. The Work Plan does not include a detailed discussion of soil-vapor sampling. Revise the Vadose Zone Investigation Work Plan to include a section describing soil-vapor sampling in detail, with discussion of sampling methods, analytical methods, sampling frequency, laboratory and field quality control, handling, shipping and packaging, and reporting of results. **PAGE 15**	No change to the work plan required.	The soil-vapor sampling program is described in Sections 5.2.2 through 5.2.5 of the Pre-Remedy Monitoring Work Plan (ATTACHMENT B to this document). Details on the analytical method, sampling frequency, laboratory and field quality control, handling, shipping and packaging, and reporting of results will be in the QAPjP that will be submitted under separate cover.
52	5. Section 5.2, top line on page 5-3 references Table 4 of the August 6,2010, NOD for number, location, and depths of soil borings/soil-vapor wells. The table number is incorrect. The correct reference is Tables 1, 2 and 3. **PAGE 15**	The work plan will be revised to read: "The number, locations, and depths of soil borings/soil vapor wells are in accordance with Tables 1, 2, and 3 of the NMED letter from the Hazardous Waste Bureau, dated August 6, 2010 (Appendix A, Attachment 2).	Revise as indicated

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SECTION C: VADOSE ZONE INVESTIGATION WORK PLAN (Continued)			
53	6. Table 5-2 of the Work Plan does not show an exact correspondence to the August 6 letter. However, NMED will accept the locations as described in Table 5-2. **PAGE 15**	No changes to the work plan required.	
54	7. Section 5.2.10, *Soil Borings/Drilling,* page 5-18, last sentence, 1st paragraph, mentions "10 ¾" O.D. casing whereas Figure 5-2 shows "11 ¾" casing. Correct, as appropriate, the figure or the text. **PAGE 15**	The text in the work plan will be revised to state "Each borehole will be drilled as a 11 ¾ inch outside diameter (O.D.) casing that telescopes down to 9 5/8 O.D. casing at 150 ft.	Revise as indicated
55	8. Section 5.2.10, *Soil Borings/Drilling,* page 5-18,last sentence, 1st paragraph, mentions telescoping to a smaller diameter borehole at 200 feet, while Figure 5-2 shows telescoping to a smaller diameter borehole at 150 feet. Correct, as appropriate, the figure or the text. **PAGE 15**	The text in the work plan will be revised to state "Each borehole will be drilled as a 11 ¾ inch outside diameter (O.D.) casing that telescopes down to 9 5/8 O.D. casing at 150 ft.	Revise as indicated
56	9. Revise the Work Plan to add total depth from the logger to the first bullet of Section 5.2.3.2. **PAGE 15**	The work plan will be revised to include the "total depth of the logger" to the first bullet of Section 5.2.3.2.	Revise as indicated
57	10. In the bullets of Section 5.2.3.2, define what "Assemble the downhole logging tool" means as a type of information recorded, or remove the bullet. **PAGE 15**	The bullet for "Assemble the downhole logging tool" will be deleted from the work plan.	Revise as indicated
58	11. Section 6.1, *Soil Sampling,* Revise the Work Plan to indicate that additional samples will be collected and analyzed, beyond those obtained at the planned sampling intervals, if field evidence suggests contamination may be present as required in Permit Part 6.5.11. **PAGE 15**	The work plan will be revised to include the collection of additional soil samples if evidence of contamination is observed in the field, outside of the planned sampling intervals.	Revise as indicated
59	12. Describe what will be submitted in Part 2 Vadose Zone Investigation Work Plan, indicate when the information will it be submitted, and explain why any of the information that was required by November 8, 2010, was not included in Part 1. **PAGE 15**	The Vadose Zone Investigation Work Plan will be revised to include an identification of data gaps related to the respective investigation. Data gaps will include: 1) Determine the amount of fuel that exists within the vadose zone 2) Identify the source of the LNAPL fuel plume 3) Characterize the vadose zone hydrology and its relationship to the groundwater 4) Characterize the geology and extent of contamination in the soil and soil gas to determine distribution, fate, and migration of contaminants	Revise as indicated An updated CSM section will be added to the each of the Quarterly Reports and will be improved based on the data collected during the current investigations (e.g., boring and geophysical logs) and will include requested geological cross-sections, maps, and other appropriate illustrations to depict geologic, hydrologic, and contaminant extent.

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SECTION C: VADOSE ZONE INVESTIGATION WORK PLAN (Continued)			
60	13. Appendix E, Section 17.3, *Pre-remedy Quarterly Monitoring Program - Soil Vapor*, discusses soil-vapor monitoring. Describe the risk evaluation the Permittee is proposing to conduct and the purpose of the evaluation. Revise the Work Plan to state that soil-gas monitoring will be conducted quarterly until a change in frequency or termination of soil-gas monitoring is approved by the NMED. **PAGE 15**	The work plan will be revised to include a discussion on the use of soil-gas sample results for the Risk Assessment, as well as the comparison of such results to USEPA (2002) screening concentrations; specifically Table 2b in USEPA (2002) Generic Screening Levels for 1E-5 target cancer risk, for shallow and deep soil gas concentrations.	Soil-gas results will be initially compared with soil-gas screening concentrations presented in USEPA (2002). A Risk Assessment outline is being prepared and will be submitted to NME for discussion.
61	14. Table 5-2 - Correct the date of the "August 8" letter to "August 6" in the title and last column heading. **PAGE 16**	Table 5-2 will be corrected to "August 6" in the title and last column heading.	Revise as indicated
62	15. Table 5-2 - Correct the locations listed in the last column under Shallow Borings. The same location is given for the five separate borings. Revise the Work Plan to correct the location numbers. **PAGE 16**	Table 5-2 will be revised to show the correct locations for the shallow borings.	Revise as indicated
63	16. There are few details of reporting in the Work Plan, and most of those are aimed at the geophysical logging. Revise the Work Plan to include details for reporting on well installation, monitoring, and sampling results. **PAGE 16**	The work plan will be revised to include a discussion of reporting for well installation and sampling results. All well installation, monitoring and sampling will be included in the subsequent quarterly report. The Pre-Remedy Work Plan contains reporting requirements for the monitoring and sample results.	Revise as indicated
64	17. Section 5.2.11, Soil Vapor Monitoring Wells, p.5-27, 1st paragraph, discusses movement of the monitoring point by up to 20 feet if the point lies in a fine-grained layer. This is acceptable for the four deepest points (150, 250, 350,450) but not for the two shallow points (25, 50). Movement of up to +/-5 feet for the shallow points will be acceptable. Screen depths can only be changed if the adjustment sets the screen in a more permeable geologic unit. **PAGE 16**	The work plan will be revised to read: "If proposed vapor monitoring points are screened in zones determined to be fine grained lithology, the screen vapor monitoring point may be adjusted up or down to the nearest coarser grained unit, if the unit is located within 20 feet of the proposed 150-, 250-, 350-, and 450-ft screened intervals. For the 50- and 25-ft screened intervals, the coarser grained unit must be within 5 feet of the proposed screen location."	Revise as indicated
65	18. Section 5.2.11, Soil Vapor Monitoring Wells, p.5-27, 1" paragraph, states "If a large deviation is required, the NMED will be notified in writing of the deviation." All deviations must have prior written approval from NMED. **PAGE 16**	The work plan will be revised to read: "If a large deviation is required, the NMED will be notified in writing of the deviation and written approval received."	Revise as indicated

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No.	**NMED COMMENT**	**WORK PLAN ACTION**	**RESPONSE TO COMMENT**
SECTION D: INTERIM MEASURES WORK PLAN			
66	1. Section 2. 4.5.3.2, Waste Profiling - The Work Plan states that soil will be characterized in place by sampling waste, but is unclear how sample locations will be selected and at what frequency that samples will be collected. Revise the Work Plan accordingly. **PAGE 16**	The work plan will be revised to reflect the sample locations and spacing requested in Section G of the December 10, 2010 NOD letter. See comments and responses above.	Revise as indicated
67	2. Section 4.6.11, Radius of Influence (ROI) Testing - The Work Plan does not indicate which existing wells will be used for the testing. Revise the Work Plan to list the wells to be used in the ROI tests. **PAGE 16**	The work plan will be revised to include a list and map showing which wells will be used for the Radius of Influence (ROI) testing. ROI testing will use a combination of both existing and newly installed soil vapor monitoring wells.	Revise as indicated
68	3. Section 4.6.2.4 states that soil-gas wells will be constructed with 2-inch casing. Figure 4-4 indicates that the deepest monitoring point will be constructed using 3-inch casing. Revise the Work Plan to indicate the correct casing diameter. If 2-inch casing is correct, confirm that all geophysical tools will fit in 2-inch casing, given the neutron probe is described as being 60 mm in diameter (2.36 inches, see p.5-24 of the Groundwater Investigation Work Plan, first paragraph, last sentence) or make an appropriate change in tool size or casing size. If 2-inch casing is correct, describe where the 2-inch casing will be located in the borehole (e.g., in the center, closer to one side), and if so, how geophysical logging conducted in the 2-inch casing could be affected by the other soil-vapor monitoring points attached to 0.75-inch diameter casing in the same nested borehole. **PAGE 16**	Section 4.6.2.4 will be revised to clarify that 3-inch PVC casing will be used for the deepest monitoring point in the PneuLog wells. This casing diameter is required to accommodate geophysical logging equipment.	Revise as indicated

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FINAL DIRECTION			
No.	**NMED COMMENT**	**WORK PLAN ACTION**	**RESPONSE TO COMMENT**
69	The Permittee must meet the deadlines specified in the Compliance Schedule at the end of this letter. The Interim Measures, Groundwater Investigation, and Vadose Zone Work Plans must be revised and resubmitted by the Permittee to the NMED for its review and approval by **March 31,** 2011. The revisions of the Vadose Zone, Interim Measures, and Groundwater Investigation Work Plans must address the comments noted herein and incorporate the requirements set forth in this letter. The Permittee shall also implement the interim measures and other actions as directed under Part I of this letter by the dates indicated and in accordance with the Compliance Schedule. **PAGE 17**	No revisions to the work plan required.	
70	To the extent any requirement of this letter requires access to property not owned or controlled by the Permittee, the Permittee shall use its best efforts to obtain access from the present owners of such property to conduct the required activities. In the event that access is not obtained when necessary, the Permittee shall immediately notify the Department in writing regarding its best efforts and its failure to obtain such access. **PAGE 17**	No revisions to the work plan required.	
71	The Permittee must document all field activities in accordance with Permit Part 6.5.2. All equipment that is not disposable must be decontaminated pursuant to Permit Part 6.5.3. All equipment that requires calibration must be calibrated as required under Permit Part 6.5.4. Sample handing, shipping, and custody procedures must comply with Permit Part 6.5.5. The collection and management of investigation-derived waste must conform to Permit Part 6.5.7. Well and boring locations must be surveyed in accordance with Permit Part 6.5.8. Field quality control samples must be collected and analyzed for all environmental media pursuant to Permit Parts 6.5.14 and 6.5.17.6. Laboratory analyses, including laboratory quality control samples, must be conducted as required under Permit Part 6.5.18. Field and laboratory quality control data must be reviewed and validated in accordance with Permit Part 6.5.18.3. Reporting of field activities, including sampling and analysis results, completion of soil borings, geologic and geophysical logging, and well installations, must be as directed by NMED's letter of June 4, 2010, for quarterly reporting. **PAGE 17**	No revisions to the work plan required.	
72	The requirement under Permit Part 6.1.2 that the Permittee is to notify the NMED a minimum of 15 days in advance of field activities is waived for the work to be completed in the following sections of Part 1 of this letter: *A. Installation of New Groundwater Monitoring Wells, B. Development of Existing Wells,* C. *Geophysical Logging of Existing Wells, D. Completion of Soil Borings, Installation of New Soil-Gas Monitoring Wells, and* 1. *Soil-Vapor Extraction.* The Permittee shall instead notify the NMED of these field activities by e-mail or letter by no later than the date that each of the activities begins. **PAGE 17**	No revisions to the work plan required.	

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PART 1 REVIEW			
No.	**NMED COMMENT**	**PROPOSED WORK PLAN ACTION**	**PROPOSED RESPONSE TO COMMENT**
1	The Permittee shall also complete the removal of the former Fuel Offloading Rack and the excavation of contaminated soil exceeding NMED Soil Screening Levels (SSLs). **PAGE 2 SECT A**	No change to work plan required	The former Fuel Offloading Rack (FFOR), and associated piping, has been removed under the MILCON USACE contract. Soil along the pipeline will be sampled and excavated as required.
7	The Permittee shall immediately complete the 35 deep and 5 shallow soil borings provided for in Section 5.2.10 of the revised Vadose Zone Investigation Work Plan. The work shall be completed by February 11, 2011(Appendix B of the Vadose Zone Investigation Work Plan). Each deep boring at each location shall be drilled from the surface to the water table. Soil samples from the deep borings shall be collected at a frequency of at least one sample every 10 feet for the first 50 feet, and at least one sample thereafter every 50 feet to total depth, and at least one sample at total depth in each boring. The soil samples shall be analyzed for TPH, VOCs, SVOCs, and lead. Soil samples from shallow borings shall be collected at depths of 0,5, 10, 15, and 20 feet and shall be analyzed for TPH, VOCs, SVOCs, and lead. Each soil boring shall be logged in accordance with Permit Part 6.5.15 by a registered professional geologist. **PAGE 4 SECT D**	The work plan text will be edited to state: "These soil samples will be analyzed for VOCs, semi-volatile organic compounds (SVOCs), total petroleum hydrocarbons (TPH), and lead." Only the soil vapor monitoring well locations listed in Table 1 of the NMED August 6, 2010 letter will be sampled. The remaining eight locations (Table 2 of the August 6, 2010 letter) will not be sampled. Boring will be logged by a qualified geologist. The boring logs will be reviewed and approved by a registered Professional Geologist as they are completed.	The drilling and sampling of the SVM wells will be completed as stated in work plan, with revisions. The installation of all 35 of the SVM well locations will not be completed by February 11, 2011. Eight of the well locations are around the existing fuel tanks at the facility, which are scheduled for demolition and site restoration in April 2011. As a result, the eight SVM wells around tanks cannot be installed until this work is completed. The SVM wells will be completed within 60 days of tank demolition and site restoration.
8	The Permittee shall immediately install the 35 soil-gas monitoring wells provided for in Section 5.2.11 of the revised Vadose Zone Investigation Work Plan submitted November 4, 2010. The well installations shall be completed by February 11, 2011 (Appendix B of the Vadose Zone Investigation Work Plan). The soil-gas monitoring wells shall be capable of yielding discrete samples of soil gas recovered from depths of 25, 50, 150, 250, 350, and 450 feet below the ground surface. The borehole of each well shall be logged in accordance with Permit Part 6.5.15 by a professional geologist. Vapor sampling and reporting requirements shall be conducted as directed in NMED's letter of June 4, 2010. **PAGE 4 SECT E**	No change to the work plan required. Boring will be logged by a qualified geologist. The boring logs will be reviewed and approved by a registered Professional Geologist as they are completed.	The installation of the 35 soil gas monitoring wells will be conducted as stated in work plan. However, the installation of all 35 of the SVM well locations will not be completed by February 11, 2011. Eight of the well locations are around the existing fuel tanks at the facility, which are scheduled for demolition and site restoration in April 2011. As a result, the eight SVM wells around tanks cannot be installed until this work is completed. The SVM wells will be completed within 60 days of tank demolition and site restoration.
9	NMED approves the Permittee's proposal to conduct borehole geophysical logging (medium and deep induction, gamma, and neutron) at all new groundwater and soil-vapor monitoring wells. Copies of the logs must be submitted to the NMED by no later than June 1, 2011. **PAGE 4 SECT F**	No changes to the work plan required	Borehole geophysical logging will be conducted in the deep groundwater and soil vapor monitoring wells within 30 days of each well installation. The data will be reviewed and included in the quarterly reports, as well as posted to the NMED data portal. The completion of wells is dependent on ROE access. Additionally, the demolition and site restoration associated with the existing fuel tanks will also impact the schedule for well completion and therefore geophysical logging

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No.	**NMED COMMENT**	**PROPOSED WORK PLAN ACTION**	**PROPOSED RESPONSE TO COMMENT**
11	NMED approves the Permittee's soil sampling plan except as modified below. Section 4.5.2 of the Interim Measures Work Plan, *FFOR Soil Investigation and Sampling*, indicates that the direct-push technology (DPT) samples are to be collected at the former Fuel Offloading Rack (FFOR) and along the remaining aboveground and underground piping on 25-ft centers. The Permittee does not adequately describe the locations of the samples nor are the locations individually depicted on Figure 4-2. No additional sampling is proposed for the known three locations of pipeline leaks, which occurred approximately 18 ft, 150 ft, and 200 ft from the west end of FFOR. **PAGE 5 SECT G**	Figure 4-2 of the Interim Measures Work Plan, will be revised to depict the proposed sample locations and the approximate locations of the pipeline leaks at 18 feet, 150 feet, and 200 feet from the west end of the former Fuel Offloading Rack.	As stated in work plan, with revisions. The approximate location of the pipeline leaks will be estimated from historical aerial photographs and as-built drawings for the FFOR. The revised Figure 4-2 is attached to this document.
17	Nevertheless, NMED has reconsidered its earlier position to expand the number of SVE Units. Instead of expanding the number of operating SVE Units, the Permittee is directed to prepare the locations of existing groundwater monitoring wells KAFB-3411, KAFB-I0614, KAFB-I0624, KAFB-l 0617, KAFB-I0618, and KAFB-l 061 0 for conducting SVE by no later than February 15, 2011. The Permittee is also directed to prepare an SVE Optimization Plan for the four existing SVE Units, with the concept that the four SVE units will be moved periodically between the six aforementioned locations and the four locations where SVE is currently conducted to maximize the removal of contaminants (by mass) via vapor extraction. Furthermore, the Permittee must propose in the SVE Optimization Plan alternative technologies for the removal and treatment of soil-vapor contamination that do not rely on the use of internal combustion engines. The SVE Optimization Plan must be submitted to NMED by March 31, 2011. **PAGE 7 SECT I**	An SVE Optimization Plan will be prepared and submitted to the NMED for review.	An SVE Optimization Plan will be prepared as stated, in which existing wells will be ranked for SVE preparation based on data collected to date and site conditions. The preparation of locations located off-base is dependent on granting of ROE access.
18	NMED approves the ROI, hydrocarbon baildown, and Pneulog tests. The Permittee shall conduct the Radius of Influence, the Hydrocarbon Baildown, and PneuLog tests by April 6, 2011; March 2,2011; and December 21, 2011, respectively. **PAGE 7 SECT J**	No changes to the work plan required	Clarification requested on the March 2, 2011date listed in letter. The radius of influence testing will be conducted within 60 days of the last SVM well installation in order to maximize the information gained from the test.

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PART 2 REVIEW			
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SECTION A: DEFICIENCIES IN ALL PLANS			
19	1. Part 1, A.7 of the NOD issued on August 6,2010, required that the Permittee list the data gaps that apply to each of the three plans, as appropriate for the topic of a plan. The Permittee was also instructed to revise the Interim Measures, Groundwater Investigation, and Vadose Zone Work Plans to include a description of at least the data gaps identified by the NMED and point specifically to where in each of the documents the data gaps are addressed. This deficiency was not corrected in any of the revised Work Plans submitted on November 4, 2010. The NMED is directing the Permittee again to revise the Interim Measures, Groundwater Investigation, and Vadose Zone Work Plans to include a description of the data gaps identified by the NMED and point specifically to where the data gaps are addressed in each of the documents. **PAGE 8**	The Groundwater Investigation Work Plan and Vadose Zone Investigations Work Plans will be revised to include the data gaps, including those discussed in the LNAPL Containment Interim Measure Work Plan. Groundwater Data Gaps: 1) Characterize the LNAPL and dissolved-phase in the groundwater (Section 5.2.3 of the Groundwater Investigation Work Plan; Section 5.2.2 of the LNAPL Containment Interim Measure Work Plan) 2) Characterize the vertical extent of the dissolve-phase in the groundwater, the effects of vertical gradients, and the geology of the aquifer depths below the water table (Sections 4.1.3 and 5.2.3 of the Groundwater Investigation Work Plan; Section 5.2.3 of the LNAPL Containment Interim Measure Work Plan) 3) Characterize the leading edge and the eastern and western margins of the plumes (Section 5.2.3 and Figure 3-1 of the Groundwater Investigation Work Plan) Vadose Zone Data Gaps: 1) Determine the amount of fuel that exists within the vadose zone (Section 5.2.11, Table 5-2, and Figure 5-1 of the Vadose Zone Investigation Work Plan; Section 4.5.2 of the Interim Measures Work Plan) 2) Identify the source of the LNAPL fuel plume (Sections 4.5.5 and 4.6.2 of the Interim Measures Work Plan) 3) Characterize the vadose zone hydrology and its relationship to the groundwater (Section 5.2.11, Table 5-2, and Figure 5-1 of the Vadose Zone Investigation Work Plan; Sections 4.6.2 and 4.6.11 of the Interim Measures Work Plan)	The LNAPL Containment Interim Measure Work Plan contains discussions of the identified data gaps. Additional clarification requested regarding the NMED identified data gaps. The Groundwater Investigation and Vadose Zone Investigation Work Plans will be revised as indicated.

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19 (Continued)		4) Characterize the geology and extent of contamination in the soil and soil gas to determine distribution, fate, and migration of contaminants (Sections 5.2.3 and 5.2.4 of the LNAPL Containment Work Plan; Section 6.1 of the Vadose Zone Investigation Work Plan; Sections 4.5.2, 4.6.2, and 4.6.11 of the Interim Measures Work Plan)	
20	2. Part 1, A.9 of the NOD issued on August 6, 2010, required that the Permittee include a site conceptual model encompassing the source area(s), the fuel percolation area, the light nonaqueous phased liquid (LNAPL) plume floating on groundwater, and the dissolved-phase contaminant plume in groundwater in each of the plans. However, none of the revised Work Plans contains a site conceptual model. Instead, the issue was addressed under the Work Plans by stating that a model will be provided later by the Permittee. The NMED is directing the Permittee again to revise the Interim Measures, Groundwater Investigation, and Vadose Zone Work Plans to include a site conceptual model encompassing the source area(s), the fuel percolation area, the light non-aqueous phased liquid (LNAPL) plume floating on groundwater, and the dissolved-phase contaminant plume in groundwater in each of the plans. The model should be illustrated through the liberal use of detailed, accurate, and scaled geologic cross-sections, maps in plan view, and any other necessary graphical representations to clearly and accurately show geologic and hydrologic features, and contaminant levels. NMED invites the Permittee to meet to discuss NMED's expectations with respect to the conceptual model and graphic representation of data. **PAGE 8-9**	No changes to the work plan required.	A tremendous amount of additional data are currently being generated. The CSM will be continuously evolving due to the data collected during the installation of the groundwater and soil vapor monitoring wells. Additionally, geophysical logging of these wells will also be critical to generating a CSM that adequately reflects the site conditions. The required quarterly reports will contain all of the required data, including data tables, plume maps, and cross sections depicting the most current understanding of the site. A site-specific CSM section will be added to every quarterly report, allowing for dynamic updating of the site CSM as information is acquired. A meeting is requested with the NMED to discuss the conceptual site model and graphic representation of data.
21	3. Part 1, A. 10 of the NOD issued on August 6,2010, required that the Permittee meet Section E of the NMED's letter of April 2, 2010, which directed that investigation plans are to include relevant maps and cross-sections that show concentration data for contaminants and other relevant information with supporting data posted on the maps and cross-sections, and clearly show which borings/wells contributed data towards construction of the maps and cross-sections and which did not. Additionally, tables including all existing soil borings, soil-gas monitoring wells, and groundwater monitoring wells, listing their surveyed location, sampling points and maximum depth of exploration were also to be included in the plans. For soil-gas monitoring wells, tables and graphs were also to be included providing trends of TPH concentration versus time for the depths below ground surface of 25, 50, 150, 250, 350, and 450 feet. The required maps, cross-sections, tables, and graphs were not included in the Work Plans submitted November 4, 201 0. Revise the Work Plans accordingly.	No changes to the work plan required.	The quarterly reports that will be submitted will contain the requested information, including tables of existing soil borings, soil-gas monitoring wells, existing groundwater monitoring wells, and sample locations, cross sections, plume maps. In addition, a site conceptual model section will be added to the report. This will result in a dynamic and up to date reporting of the CSM each quarter.

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26	4. Section 5.2.5.2, *Induction Logging,* on page 5-22, 3rd paragraph, 1 S\ sentence states: "The borehole induction system can be used in boreholes that range from 2 to 8 inches diameter without significant borehole effects." Because the Permittee is proposing to drill boreholes with diameters of 9-5/8 and 11-3/4 inches, indicate whether the borehole induction system can be used properly in boreholes with diameters greater than 8 inches, or modify the plan to indicate that another, more appropriate tool will be used to log the boreholes. **PAGE 10**	The three sections on the loggings tools will be modified to present the capabilities of the tools with increased clarity. The three sections on the loggings tools will be revised to present the capabilities of the tools with increased clarity. **5.2.5 Borehole Geophysical Investigation** Borehole geophysics, consisting of induction, neutron, and gamma logging, will be conducted on 29 existing monitoring wells and the 28 new monitoring wells to be installed as described in this work plan. The deepest well installed at each of the 28 well clusters will be logged. Geophysical logging will aid in fully characterizing subsurface stratigraphy and the nature and extent of vadose zone and groundwater contamination. The ultimate goal of geophysical borehole logging investigations is to use the data to refine the CSM of the potential source location(s) and the extent of the LNAPL contamination, in order to optimize placement of remedial SVE and groundwater extraction wells and potential future monitoring wells. For this objective, it is expected that the characterization of the fine-grained clay and silt units in the vadose zone will be mapped with a vertical accuracy of less than 1 ft. Borehole logging will follow standard industry practices such as those presented in the ASTM 5753 *(Standard Guide for Planning Borehole Geophysical Logging)*, ASTM D 6274 (*Standard Guide for Conducting Borehole Geophysical Logging – Gamma)*, ASTM D 6127 (*Standard Guide for Conducting Borehole Geophysical Logging: Neutron)*, and ASTM D 6726 (*Standard Guide for Conducting Borehole Geophysical Logging: Electromagnetic Induction*).	The borehole diameter of 2-8 inches was based on the anticipated use of the Geonics EM39 induction probe, which has an intercoil spacing of 20 inches. The probe actually used for the project is an induction probe that utilizes two intercoil spacing's of 20 and 33 inches. The larger intercoil spacing of 33 inches will provide information on the conductivity of the uninvaded zone (90 % of the cumulative instrument response will come from a radial distance of more than 8 inches).

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26 (Continued)		***5.2.5.1 Downhole Geophysical Logging*** Geophysical techniques have proven to be valuable tools in determining lithology, porosity, and moisture condition of various stratigraphic units. Downhole geophysical logging will be conducted using a suite of logs to include medium and deep induction, neutron, and natural gamma (large crystal) tools. The objective of this effort is to characterize the fine-grained clay and silt units in the vadose zone with a vertical accuracy of less than 1 ft. The logs will be run from the groundwater table (approximately 500 ft bgs) to ground surface through PVC well casing. Equipment will be decontaminated at each well location before conducting logging activities. All logging equipment will be calibrated in accordance with manufacturer's specifications. "Shop" calibrations will be performed within 30 days of the logging event. During the first mobilization operations will be confined to KAFB and before and after calibrations will be conducted for each logging tool at each well. During the second mobilization operations will occur in the neighborhoods surrounding KAFB. Due to the interferences anticipated in this cultural setting (e.g., nulling the induction probe near large metal objects, power line interference, etc.) and safety factors associated with the neutron probe radioactive source, tool calibrations may be performed at a calibration site within the KAFB boundaries prior to and at the conclusion of each day's activities. The Induction probe will be run free in casing during logging activities, and the neutron probe will be "sidewalled" using a bow spring or mechanical arm. This information will be recorded on the Shaw wireline logging	

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26 (Continued)		summary sheet for each well. A minimum of 100 ft of repeat log will be performed after the initial logging effort and the initial and repeat logs will be provided to the Shaw representative in hardcopy form for review. After completion of the borehole, a paper copy of the strip logs will be provided to the Shaw representative for review and approval. Digital data files for all logs also will be provided by the logging contractor at the end of the field day. Geophysical logs will show results of induction logging (medium and deep) in ohm meters, neutron logging in American Petroleum Institute (API) neutron units, and gamma logging in API-calibrated counts per second. The results of each method will be plotted versus depth from the surface to total depth of the borehole for which the log represents. The name of the borehole, location of the borehole, the date(s) that the borehole was completed, the drilling method, after survey depth error (ASDE), and the elevation of the top of the borehole will also be noted in the boring log. Data will be provided to the Shaw representative in hard copy and in digital format. The logs will be evaluated /interpreted along with soil boring logs, well construction reports, and previous geophysical logs acquired in the surrounding area. ***5.2.5.2 Induction Logging*** EM-induction logs record the electrical conductivity (inverse of resistivity) of the materials surrounding the borehole. The conductivity is dependent on the porosity, permeability, type of material, moisture content, and total dissolved-solids (TDS) concentration of the water within the unconsolidated materials or rocks.	

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26 (Continued)		Electromagnetic (EM) induction logging provides detailed stratigraphic information from dry, cased (PVC), or uncased holes. A small transmitter coil in the borehole probe induces eddy currents in the surrounding geologic material. The eddy currents generate a secondary magnetic field in the geologic materials. The strength of the magnetic field is controlled by the electrical properties of both geologic materials and groundwater. A receiver coil in the borehole measures the strength of the quadrature component of the secondary magnetic field, and electronics in the instrument console convert the magnetic field strength to values of conductivity. Approximately 90 % of the tool response from the deep induction log occurs at distances greater than 8 inches from the borehole (ASTM D 6726). Consequently, borehole effects are minimized and the measured electrical conductivity responds to the "true" formation conductivity. Drift and noise are typically less than 1 millisiemen (mS) per meter and conductivity changes of a few percent can be resolved. The intercoil spacing resolves conductivity layers that are approximately 22 inches thick. The system may detect layers that are thinner than 22 inches; however, the measured value is the product of conductivity contrast multiplied by layer thickness. The dual focused induction probe proposed for use is 1.7 inches in diameter and 9 ft in length and provides two conductivity measurements at 25.6 Khz frequency corresponding to "medium" and "deep" radii of investigation. ***5.2.5.3 Gamma Logging***	

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26 (Continued)		Gamma logs detect the amount of natural gamma radiation emitted by the rocks surrounding the borehole. Naturally occurring radiation comes from three principal areas: potassium-40, which occurs with all potassium minerals; uranium-238; and thorium-232, which is associated primarily with biotite. Clayey and shaley rocks typically have higher gamma radiation due to their composition of the weathering products of potassium feldspar and mica. The natural gamma tool is used for general lithologic identification and stratigraphic correlation. The typical radius of investigation for the natural gamma log is approximately 10 to 12 inches from the borehole wall. The natural gamma probe utilizes a sodium-iodide, thallium-activated crystal to measure gamma-ray emissions from soil or rock. The method can be used in uncased, steel-cased, or PVC-cased and continuously measures, in counts per second, gamma-rays emitted primarily from uranium, potassium-40, and thorium. The natural gamma crystal will be integrated with the induction and neutron probes for the first mobilization. The natural gamma crystal will be integrated with the neutron probe for the second mobilization. A calibration certificate for the gamma will be provided by the logging contractor. ***5.2.5.4 Neutron Logging*** Neutron logging uses an active radioactive source to identify porous formations and lithology. The tool is also used to identify water saturation in vadose zones. Neutron logs map the apparent porosity of the materials surrounding the borehole by emitting high energy neutrons. The neutron	

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26 (Continued)		measurement is a single function radiation probe that detects thermal neutrons using a He-3 detector. An americium-241 (beryllium-activated, americium-beryllium-241 [AmBe-241]) neutron source emits high energy (fast) neutrons into the formation. These neutrons diffuse through the formation and collide with the atoms present. Collisions with atoms nearest the mass of neutrons, such as hydrogen, result in an exchange of energy. Thus, these neutrons are slowed down to thermal energies which can be detected by the He-3 detector. Since slowing is primarily due to collisions with hydrogen, neutron count rates represent the hydrogen content of the formation and can be interpreted in terms of porosity. The tool used during the first mobilization will use two different source-detector spacings (near and far). For the second mobilization, a single He3 detector will be used that is located 16 inches above the neutron source. The probe used for the second mobilization is 1.7 inches in diameter and 6.9 ft in length. The necessary containers and safeguards for the transportation, storage, and use of nuclear source(s) will be provided. The operator will be properly trained, certified, and maintain the required licenses to handle nuclear source(s). Work will complete with all federal and state requirements for the use of active-source tools.	
27	5. Section 5.2.5.2, *Induction Logging*, page 5-22, the last sentence of the 3rd paragraph states; "The maximum depth of measurement for the most induction logging systems is 650 ft (200) meters)." Explain what this sentence means, as wells many thousands of feet deep are logged using induction logging. If the sentence is incorrect, correct the sentence or delete it from the Work Plan. **PAGE 10**	The sentence, "The maximum depth of measurement for the most induction logging systems is 650 ft (200 meters)" will be deleted from the work plans. The text in Section 5.2.5.2 will be modified to read: "A Mount Sopris MGX digital logger (or equivalent) will be used. This facilitates interchanging probes, as well as allowing the data to be collected on a DOS-based field notebook as the winch raises and lowers the	Revise as indicated.

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		probe. The logging system will be equipped with a 0.1-0.125-inch steel conductor cable long enough to log the wells of interest."	

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28	6. The last paragraph and bullets in Section 5.2.5.2, *Induction Logging,* discusses general procedures for all geophysical logging. This discussion needs to be moved to a more general section, such as Section 5.2.5 *Logging Requirements.* Also: a. Add total depth from the logger to the list of bullets. b. Add the same information to the list of bullets that is to be recorded in the first bullet of Section 5.2.3.2 of the Vadose Zone Investigation Work Plan (e.g., logging tool serial number, sensitivity range setting). c. The Permittee must include the measured deviation between the "zero point" of the tool at ground level at the start of the logging run and after completing the logging run. **PAGE 10**	The specified section will be moved to Section 5.2.5. a) The total logging depth will be added to the list. b) The same information will be added to the list of bullets in Section 5.2.3.2 of the Vadose Zone Investigation Work Plan. c) The after survey depth error (ASDE) tolerance will be added to Section 5.2.3.6, *Logging Requirements* Section 5.2.6 will be modified as follows: **5.2.6 Logging System and Requirements** A general procedure for the information recorded for a borehole geophysics survey will include recording all information necessary to correctly interpret the log, including: • Project number • Well identification number • Well completion information • Location of the zero-depth of the log, which may be the top of the casing, ground level, or some other specified point • Height of the top of the casing aboveground level • Depth of the bottom of the casing(s) and screen interval • Total depth geophysically logged • Total depth drilled ***5.2.6.1 Logging System*** A Mount Sopris MGX digital logger (or equivalent) will be used. This facilitates interchanging probes as well as allowing the data to be collected on a DOS-based field notebook as the winch raises and lowers the	Revise as indicated.

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28 (Continued)		probe. The logging system will be equipped with a 0.1- or 0.125-inch steel, armored, single conductor cable long enough to log the wells of interest. ***5.2.6.2 Pre-Logging Requirements*** Pre-logging activities include drilling, as necessary, and mobilization of the logging unit by the logging contractor to the borehole locations. The following are basic pre-logging requirements: • Boring logs will be prepared for each borehole during drilling for field comparison with the wireline logs. Zones of extensive circulation, lost circulation, suspected washouts, or drilling problems will be noted for anticipation of possible log response. • Hole deviations will be recorded on the appropriate form(s) if directional surveys were run. • A wireline logging summary will be filled out for each borehole. Information such as the tool, logging speed, repeat interval, depth reference, start and end time, calibration information, etc. will be recorded. . A tool status report will be onsite for all tools plus spares. • All logging equipment will be properly decontaminated before arrival onsite, between wells, and before leaving the site. The equipment will be decontaminated according to Section 5.4 of this work plan. • For logging in cased holes, a "dummy" tool of the same dimensions may be used to ensure the working tool does not stick in the hole. This is especially useful for small-diameter PVC casing, which may	

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28 (Continued)		flex when it is set in the borehole. Logging Requirements The general borehole geophysical logging process consists of the following: 1. After mobilization to the borehole and decontamination of the equipment, the contractor connects the first tool to the logging cable. 2. The contractor conducts the "before" logging calibration check at the well or another pre-approved location at the start of the day to ensure the instrumentation is functioning properly. The calibration results are checked to ensure that they meet the required tolerances. 3. The tool is placed in the hole and adjusted to "zero" depth at a pre-defined depth reference (e.g., top of casing). The contractor checks to ensure that all equipment is still functioning properly and then lowers the logging tool into the borehole. 4. While the tool is lowered to the bottom of the hole, the logging tool response is monitored by the logging engineer. 5. Once the tool is at the bottom of the hole a final check is completed (instrument settings, logging scales, total depth, etc.). Logging is commenced up the hole at the proper speed (re: logging contractor SOPs) and data are digitally recorded. The logging speed and sample interval are documented on the wireline summary sheet and log header for each well. 6. Once the upwards logging run is completed, the tool is placed back in the hole at a specified interval to collect a repeat section for QC purposes. 7. Field copies of all logs are generated. The original and repeat log sections are checked for overall quality and repeatability.	

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28 (Continued)		8. Post-logging calibration checks are performed at the well site or at the end of the day. 9. If data are collected with another tool, the process above is repeated. If not, the logging unit and associated tools and equipment are decontaminated and prepared for transfer to the next borehole. The following required items are necessary for effective implementation of the logging process and generation of useful logs of appropriate quality: • The pullout strength of the cable socket, which connects the tool to the cable, will be known before entry into the hole. • Calibration procedures, both in the shop and in the field, must be performed. The time and results of the last shop calibration for each tool will be documented. • Field calibrations are performed prior to and after logging and recorded on the wireline logging summary sheet. • When logging tools are run in combination, all curves are referenced to the same depth reference point (e.g., top of casing or ground level). • Depth control will be used for each logging run. This is accomplished by placing the tool reference point at a known point (e.g., top of casing) and using that location as the "zero" reference for the logging run. • The after survey depth error (ASDE) metric for the project will be 0.4 % of the logged depth between the start and end of a logging run where the tool is referenced to a zero depth at a pre-defined point prior to and at the end of the logging sequence. The proposed	

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28 (Continued)		ASDE is based on the current ASTM standards and will ensure the logging data are of sufficient quality to meet the project objectives. The ASDE is documented on the log header for each well. • Ensure the driller drills a rat hole deep enough so as to provide enough depth for the log's first valid readings to be in the sand or gravel at the bottom of the well. • Repeat sections will be run for all logs. The repeat sections will be selected based on zones of interest and will be a minimum of 100 ft in length. Attention to detail during borehole geophysical logging, including equipment setup, calibration, and monitoring, is required for obtaining accurate and reliable data. Borehole geophysical logs are subject to a number of potential tool problems and operational errors. A Shaw QC representative will be present during the entire logging operation to provide oversight of the logging process. The Shaw QC representative will independently document the logging activities to ensure the data are of sufficient quantity and quality to meet the project objectives. Any and all problems (including tool malfunction and significant downtime) and associated corrective actions will be recorded by the Shaw QC representative on the appropriate form(s) according to the project work plans. Field copies of all logs will be provided to the Shaw QC representative at the end of each logging run . The QC representative will review the log and check the data for overall quality and repeatability (e.g., noise spikes, depth reference, drift of the EM log, etc,) Any potential quality issues will be brought to the attention of the contractor and resolved	

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28 (Continued)		prior to demobilization form the site. For the field logs (and final logs [see below]), all off-scale readings, drift adjustments, and first curve readings will be marked on the logs, and all curves identified and labeled. All post-logging field calibrations must be run for each tool and recorded on the log tails or headers. These will be checked with the pre-log calibrations, noting any changes. A wireline logging summary sheet will be completed for each borehole. Header information will be thoroughly filled out, including equipment and calibration date. The type, temperature, and resistivity of any fluids and other associated measured parameters will be recorded, as applicable. Any unusual conditions, problems, or concerns regarding the logging run are to be included in the remarks section. Logging speeds, time constants, and tool model will be correctly recorded. The digital data for the original, repeat, and tool calibrations are digitally recorded and will be maintained as part of the official project record. The logs will be completed to the satisfaction of the Shaw QC representative before the logging contractor is allowed to rig down. Final approval for acceptance of the quality of the log will rest with the QC representative and project manager. ***5.2.6.3 Post-Logging Requirements*** A predetermined number of final log prints will be provided within 2 weeks of completing the final logging run including the final composite logs. Any and all information required for entry on the field logs above will be included on the final log prints. In addition to the hardcopy logs, raw and final processed digital data will be delivered within two weeks of project completion.	
29	7. Describe in Section 5.2.5.1 of the Work Plan if tools are to be run centralized,	The following paragraph will be added to	Revise as indicated.

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	decentralized, or free in casing and describe where that information will be recorded. **PAGE 10**	Section5.2.5.1 of the work plan: "The Induction probe will be centralized in the well during logging activities with a fin assembly and the neutron probe will be decentralized using a bow spring. This information will be recorded on the Shaw wireline logging summary sheet for each well logged."	

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30	8. Section 5.2.6.1, Logging System, p.5-25, last sentence, states "The logging system will be equipped with .... cable long enough to log 600-ft.depths." Because some of the groundwater monitoring wells may be 610-620 ft deep, the logging system must be capable of logging the full depth of all wells, even those in excess of 600 ft depth. **PAGE 11**	The text in Section 5.2.6.1 will be modified to read: "A Mount Sopris MGX digital logger (or equivalent) will be used. This facilitates interchanging probes, as well as allowing the data to be collected on a DOS-based field notebook as the winch raises and lowers the probe. The logging system will be equipped with a 0.1-0.125-inch steel conductor cable long enough to log the wells of interest."	Revise as indicated.
31	9. Table 4-1, Data Quality Objectives Summary Table, in the 3rd and 4th column in row 4, *Define the Study Boundary* states "Study boundaries are indicated on Figure 2-1". Many wells are outside the study boundary shown on the figure. Correct the statement or the figure as appropriate. Revise Table 4-1 in accordance with the directives in this letter, or delete the table. Although the Permittee may use the EPA's DQO process to plan work, NMED prefers that Table 4-1 and Section 4 be deleted from the Work Plan, as they add little additional useful information. Items in the table should be included in the text of the Work Plan with additional details and as modified in accordance with the directives of this letter. **PAGE 11**	Figure 2-1 will be revised to include the study boundary. Section 4.0 and Table 4-1 will be deleted from the revised work plan.	Revise as required
34	12. The 2nd paragraph, last sentence of the *Preface* states "Part II will consist of the evaluation of all existing and new data, and development of the risk assessment (including the conceptual site model), and the Groundwater Investigation Report (including cross sections and plan views)." Revise the Work Plan to include a detailed description of what is to be included in the Part II Work Plan. NMED notes further that the inclusion of a "report" in a work plan is unusual and generally inappropriate. Information derived from newly completed work is normally submitted as a stand alone report, not as a section of a work plan. Furthermore, the schedule in Appendix B lists the Part II Work Plans as being submitted by August 6,2011. Because the contents of the Phase II plans are unknown to the NMED, the NMED can not agree to this submittal due date. **PAGE 11**	No changes to the work plan required	All of the data/maps/cross sections/trends will be included in the quarterly reports. A CSM section will be added to the quarterly report and updated for each submission. The risk assessment will be developed following the collection of needed data. This report will be submitted concurrently with the Investigation Report.
35	13. There are few details of reporting in the Work Plan, and most of those are aimed at the geophysical logging. Revise the Work Plan to include details for reporting on well installation, monitoring, and sampling results. **PAGE 12**	The work plan will be revised to include the following statement: "Reporting will be included in each quarterly report. All new borings, data, etc., will be included in the report. The CSM will be updated in each quarterly report." The Pre-Remedy Work Plan contains reporting requirements for the monitoring and sample results.	Reporting will be included in each quarterly report. All new borings, data etc. will be included in the report. The CSM will be updated in each quarterly report.

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PART 2 REVIEW			
No.	**NMED COMMENT**	**WORK PLAN ACTION**	**RESPONSE TO COMMENT**
SECTION B: GROUNDWATER INVESTIGATION WORK PLAN (Continued)			
36	14. Section 3.5.3, *Identification of Contaminants of Potential Concern,* page 3-10 lists WQCC water quality standards from 20.6.2 NMAC. The cleanup levels for groundwater shall be the New Mexico Water Quality Control Commission (WQCC) water quality standards (20.6.2.3103 and 20.6.2.4103 NMAC) and the drinking water maximum contaminant levels (MCLs) adopted by EPA under the Federal Safe Drinking Water Act (42 U.S.C. §§ 300fto 300j-26). If both a WQCC standard and a MCL have been established for a contaminant, then the most stringent of the two levels shall be the cleanup level for that contaminant. If a WQCC standard or MCL has not been established for a contaminant, the EPA Regional Screening Level (RSL) (EPA, 2009) for tap water shall be used as the cleanup level. If a RSL for tap water does not exist for a contaminant, and toxicological information is available, the Permittee shall propose a cleanup level based on a residential scenario, a total target human health excess cancer risk level of 10-5 and for non-carcinogenic contaminants a HQ of one (1.0). Revise the Work Plan accordingly. **PAGE 12**	The work plan will be revised to include the statement: Section 3.5.3 is a preliminary assessment of COPCs for the project site. A final list of COPCs will be determined in the Risk Assessment and presented in the final report."	This section was simply a preliminary listing of COPCs which will be finalized in the Risk Assessment. Identification of ARARs, RAOs and cleanup levels will be finalized in the CMS.
42	20. Appendix C, *Waste Management Plan*, Table 2 implies that the preferred method of disposal of non-hazardous waste water, a form of investigation-derived waste (IDW), is to discharge it to the ground surface. NMED encourages the Permittee to dispose such nonhazardous waste water into the City of Albuquerque's Publically-Owned Treatment Works (POTW) sewer system. Furthermore, all such water must be containerized and tested prior to disposal in accordance with 20.4.1.300 NMAC incorporating 40 CPR § 262.11. Waste water from one well can not be commingled with that from any other well or wells unless demonstrated not to be a hazardous waste. **PAGE 13**	The work plan will be revised to describe the methodology for handling the disposal of non-hazardous waste water.	The NMED Groundwater Quality Bureau has been contacted for the preferred method to manage IDW non-hazardous waste water. The decision tree is attached.

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SECTION C: VADOSE ZONE INVESTIGATION WORK PLAN			
59	12. Describe what will be submitted in Part 2 Vadose Zone Investigation Work Plan, indicate when the information will it be submitted, and explain why any of the information that was required by November 8, 2010, was not included in Part 1. **PAGE 15**	The Vadose Zone Investigation Work Plan will be revised to include an identification of data gaps related to the respective investigation. Data gaps will include: 1) Determine the amount of fuel that exists within the vadose zone 2) Identify the source of the LNAPL fuel plume 3) Characterize the vadose zone hydrology and its relationship to the groundwater 4) Characterize the geology and extent of contamination in the soil and soil gas to determine distribution, fate, and migration of contaminants	Revise as indicated An updated CSM section will be added to the each of the Quarterly Reports and will be improved based on the data collected during the current investigations (e.g., boring and geophysical logs) and will include requested geological cross-sections, maps, and other appropriate illustrations to depict geologic, hydrologic, and contaminant extent.
60	13. Appendix E, Section 17.3, *Pre-remedy Quarterly Monitoring Program - Soil Vapor*, discusses soil-vapor monitoring. Describe the risk evaluation the Permittee is proposing to conduct and the purpose of the evaluation. Revise the Work Plan to state that soil-gas monitoring will be conducted quarterly until a change in frequency or termination of soil-gas monitoring is approved by the NMED. **PAGE 15**	The work plan will be revised to include a discussion on the use of soil-gas sample results for the Risk Assessment, as well as the comparison of such results to USEPA (2002) screening concentrations; specifically Table 2b in USEPA (2002) Generic Screening Levels for 1E-5 target cancer risk, for shallow and deep soil gas concentrations.	Soil-gas results will be initially compared with soil-gas screening concentrations presented in USEPA (2002). A Risk Assessment outline is being prepared and will be submitted to NME for discussion.