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

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MAY 5 2014

CERTIFIED RETURN-RECEIPT REQUESTED

NMED
Hazardous Waste Bureau

Colonel Tom D. Miller
377 ABW/CC
2000 Wyoming Blvd SE
Kirtland AFB NM 87117

MAY 01 2014

Office of the State Engineer
c/o Jeffrey L. Peterson
Water Rights Division
5550 San Antonio Blvd NE
Albuquerque, New Mexico 87109

Dear Mr. Peterson

Kirtland Air Force Base (KAFB) is submitting herein one "Application for Permit to Drill Well with No Consumptive Use of Water" for one well, and supporting documents. KAFB is proposing to advance one air sparge/soil vapor extraction (SVE) well (KAFB-106211) into the water table to aid in the evaluation and remediation of contaminated groundwater associated with the KAFB bulk fuels facility fuel release. This proposed well is located on Veteran's Administration property. KAFB respectfully requests your review/response no later than 12 May 2014 in order to meet the New Mexico Environment Department's (NMED) 30 June 2014 Liquid Non Aqueous Phase Liquid Interim Measure implementation directive dated 24 April 2014.

The air sparge/SVE well, KAFB-106211, will consist of a single borehole, advanced to approximately 510 ft bgs (depth to the water table is approximately 470 ft bgs). Borehole advancement (drilling) will be performed using the air-rotary casing hammer (ARCH) method. The borehole will contain two installed well casings, one air sparge casing and one SVE casing. The air sparge casing will be 1 1/4-inch-diameter with a screened interval at approximately 490 to 495 ft bgs and the SVE casing will be a 3-inch diameter casing screened at approximately 370 to 450 ft bgs. The casings will be flush threaded with Schedule 80 polyvinyl chlorate (PVC) casing. The sparge casing will utilize factory-slotted PVC 0.010-inch slot screen and the SVE casing will utilize factory-slotted PVC 0.050-inch slot screen. The air sparge casing will be pressurized to oscillate the groundwater, which will move volatile contaminants from the groundwater to the vadose zone, and the SVE system will remove those contaminants from the vadose zone.

KAFB-106211 will be installed upgradient, approximately 50 ft south and 10 ft west, of the existing well KAFB-10617 (just south of Ridgecrest and east of the VA parking lot). KAFB-10617 contains low levels of ethylene di-bromide (EDB) and benzene and will be used to monitor these contaminants during the air sparge/SVE pilot test. Well KAFB-10617 will

KAFB4139



initially be sampled every two weeks for the first month, and subsequently sampled once per month. The anticipated radius of influence of the sparge/SVE well is 50 feet and therefore KAFB-10617 should show results within the first few months of testing.

The specific requirements for pollution control and recovery (Page 3 of the enclosed application) will apply to all wells as follows:

- The need for the pollution control or recovery operation:
The sparge/SVE well will be installed as part of SWMU SS-111, which is groundwater impacted by jet fuel. The New Mexico Environment Department has directed Kirtland AFB to implement Interim Measures to address the groundwater contamination by June 30, 2014.
- The estimated maximum period of time for completion of the operation:
10 years
- The annual diversion amount:
Not applicable.
- The annual consumptive use:
Not applicable, as the sparge well will not be used for pumping or groundwater sampling.
- The maximum amount of water to be diverted and injected for the duration of the operation:
Not applicable.
- The method and place of discharge
Not applicable.
- The method of measurement of water produced and discharged:
Not applicable.
- The source of water to be injected:
Not applicable.
- The method of measurement of water injected:
Not applicable.
- The characteristics of the aquifer:
The aquifer is primarily comprised of unconsolidated sand and gravel, with an average hydraulic conductivity of 63 feet/day.
- The method of determining the resulting annual consumptive use of water and depletion from any related stream system:
Not applicable.
- Proof of any permit required from the New Mexico Environment Department:
Not applicable.
- An access agreement if the applicant is not the owner of the land on which the pollution plume control or recovery well is to be located:
Kirtland AFB has access to all wells included in the application.

In addition to the application, this packet contains a summary of the well construction, a figure of the well construction and a figure showing the well location.

Please contact Mr. L. Wayne Bitner at 505.853.3484 or ludie.bitner@us.af.mil or Ms. Victoria R. Branson at 505.846.6362 or victoria.branson@us.af.mil, if you have any questions.

Sincerely



(FOR) TOM D. MILLER, Colonel, USAF
Commander

Attachments:

NMED OSE Application for Sparge/SVE Well KAFB-106211

cc:

NMED-HWB (Kieling, Cobrain, Moats, McDonald, Brandwein) w/attach

NMED-GWQB (Schoepner) w/attach

NMED-PSTB (Reuter) w/attach

NMED-OGC (Kendall) w/o attach

EPA Region 6 (King) w/o attach

AFCEC-CZRX (Oyelowo) w/o attach

Public Info Repository, AR/IR, and File w/attach

File No.



NEW MEXICO OFFICE OF THE STATE ENGINEER

APPLICATION FOR PERMIT TO DRILL A WELL WITH NO CONSUMPTIVE USE OF WATER



(check applicable box):

For fees, see State Engineer website: <http://www.ose.state.nm.us/>

Purpose:	<input checked="" type="checkbox"/> Pollution Control And / Or Recovery	<input type="checkbox"/> Geo-Thermal
<input checked="" type="checkbox"/> Exploratory	<input type="checkbox"/> Construction Site De-Watering	<input checked="" type="checkbox"/> Other (Describe): Air Sparge/ Soil Vapor Extraction
<input type="checkbox"/> Monitoring	<input type="checkbox"/> Mineral De-Watering	
A separate permit will be required to apply water to beneficial use.		
<input type="checkbox"/> Temporary Request - Requested Start Date:		Requested End Date:
Plugging Plan of Operations Submitted? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		

1. APPLICANT(S)

Name: Kirtland Air Force Base	Name: N/A
Contact or Agent: Wayne Bitner check here if Agent <input checked="" type="checkbox"/>	Contact or Agent: N/A check here if Agent <input type="checkbox"/>
Mailing Address: Chief Environmental Restoration 377 MSG/CEANR 2050 Wyoming Blvd. SE	Mailing Address: N/A
City: Albuquerque	City: N/A
State: NM Zip Code: 87117-5270	State: Zip Code:
Phone: N/A <input type="checkbox"/> Home <input type="checkbox"/> Cell Phone (Work): 505-853-3484	Phone: N/A <input type="checkbox"/> Home <input type="checkbox"/> Cell Phone (Work): N/A
E-mail (optional): Ludie.Bitner@us.af.mil	E-mail (optional): N/A

FOR OSE INTERNAL USE

Application for Permit, Form wr-07, Rev 4/12/12

File Number:	Trm Number:
Trans Description (optional):	
Sub-Basin:	
PCW/LOG Due Date:	

2. WELL(S) Describe the well(s) applicable to this application.

Location Required: Coordinate location must be reported in NM State Plane (NAD 83), UTM (NAD 83), or Latitude/Longitude (Lat/Long - WGS84).
 District II (Roswell) and District VII (Cimarron) customers, provide a PLSS location in addition to above.

NM State Plane (NAD83) (Feet)
 UTM (NAD83) (Meters)
 Lat/Long (WGS84) (to the nearest 1/10th of second)
 NM West Zone
 Zone 12N
 NM East Zone
 Zone 13N
 NM Central Zone

Well Number (if known):	X or Easting or Longitude:	Y or Northing or Latitude:	Provide if known: -Public Land Survey System (PLSS) (Quarters or Halves, Section, Township, Range) OR - Hydrographic Survey Map & Tract; OR - Lot, Block & Subdivision; OR - Land Grant Name
KAFB-106211	1542915.4291	1475187.9540	N/A

NOTE: If more well locations need to be described, complete form WR-08 (Attachment 1 – POD Descriptions)
 Additional well descriptions are attached: Yes No If yes, how many _____

Other description relating well to common landmarks, streets, or other: Please see attached Figure1. The well will be installed approximately 200 feet south of Ridgecrest Ave SE, and approximately 700 ft east of San Pedro Blvd SE.

Well is on land owned by: The Veteran's Administration

Well Information: NOTE: If more than one (1) well needs to be described, provide attachment. Attached? Yes No
 If yes, how many _____

Approximate depth of well (feet): 510.00	Outside diameter of well casing (inches): 5
Driller Name: National EWP, Inc.	Driller License Number: WD-1210

3. ADDITIONAL STATEMENTS OR EXPLANATIONS

Please see attachments for well location and installation details. Well KAFB-106211 will be installed to sparge the groundwater which will move volatile contaminants from the groundwater to the vadose zone, and SVE will remove those contaminants from the vadose zone. The air sparge/SVE well will allow CB&I evaluate further EDB and benzene removal, and also evaluate how creating more aerobic conditions in this limited area might affect ongoing anaerobic degradation and potential plume expansion/migration.

FOR OSE INTERNAL USE

Application for Permit, Form wr-07

File Number:	Trn Number:
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4. SPECIFIC REQUIREMENTS: The applicant must include the following, as applicable to each well type. Please check the appropriate boxes, to indicate the information has been included and/or attached to this application:

<p>Exploratory: <input checked="" type="checkbox"/> Include a description of any proposed pump test, if applicable.</p>	<p>Pollution Control and/or Recovery: <input checked="" type="checkbox"/> Include a plan for pollution control/recovery, that includes the following: <input type="checkbox"/> A description of the need for the pollution control or recovery operation. <input type="checkbox"/> The estimated maximum period of time for completion of the operation. <input type="checkbox"/> The annual diversion amount. <input type="checkbox"/> The annual consumptive use amount. <input type="checkbox"/> The maximum amount of water to be diverted and injected for the duration of the operation. <input type="checkbox"/> The method and place of discharge. <input type="checkbox"/> The method of measurement of water produced and discharged.</p>	<p>Construction De-Watering: <input type="checkbox"/> Include a description of the proposed dewatering operation, <input type="checkbox"/> The estimated duration of the operation, <input type="checkbox"/> The maximum amount of water to be diverted, <input type="checkbox"/> A description of the need for the dewatering operation, and, <input type="checkbox"/> A description of how the diverted water will be disposed of.</p>	<p>Mine De-Watering: <input type="checkbox"/> Include a plan for pollution control/recovery, that includes the following: <input type="checkbox"/> A description of the need for mine dewatering. <input type="checkbox"/> The estimated maximum period of time for completion of the operation. <input type="checkbox"/> The source(s) of the water to be diverted. <input type="checkbox"/> The geohydrologic characteristics of the aquifer(s). <input type="checkbox"/> The maximum amount of water to be diverted per annum. <input type="checkbox"/> The maximum amount of water to be diverted for the duration of the operation. <input type="checkbox"/> The quality of the water. <input type="checkbox"/> The method of measurement of water diverted.</p>
<p>Monitoring: <input type="checkbox"/> Include the reason for the monitoring well, and, <input type="checkbox"/> The duration of the planned monitoring.</p>	<p><input type="checkbox"/> The source of water to be injected. <input type="checkbox"/> The method of measurement of water injected. <input type="checkbox"/> The characteristics of the aquifer. <input type="checkbox"/> The method of determining the resulting annual consumptive use of water and depletion from any related stream system. <input type="checkbox"/> Proof of any permit required from the New Mexico Environment Department. <input type="checkbox"/> An access agreement if the applicant is not the owner of the land on which the pollution plume control or recovery well is to be located.</p>	<p>Geo-Thermal: <input type="checkbox"/> Include a description of the geothermal heat exchange project, <input type="checkbox"/> The amount of water to be diverted and re-injected for the project, <input type="checkbox"/> The time frame for constructing the geothermal heat exchange project, and, <input type="checkbox"/> The duration of the project. <input type="checkbox"/> Preliminary surveys, design data, and additional information shall be included to provide all essential facts relating to the request.</p>	<p><input type="checkbox"/> The recharge of water to the aquifer. <input type="checkbox"/> Description of the estimated area of hydrologic effect of the project. <input type="checkbox"/> The method and place of discharge. <input type="checkbox"/> An estimation of the effects on surface water rights and underground water rights from the mine dewatering project. <input type="checkbox"/> A description of the methods employed to estimate effects on surface water rights and underground water rights. <input type="checkbox"/> Information on existing wells, rivers, springs, and wetlands within the area of hydrologic effect.</p>

ACKNOWLEDGEMENT

I, We (name of applicant(s)), (FOR) TOM D. MILLER, Colonel, USAF, Commander
 Print Name(s)

affirm that the foregoing statements are true to the best of (my, our) knowledge and belief.

Heather Spingle
 Applicant Signature

 Applicant Signature

ACTION OF THE STATE ENGINEER

This application is:

- approved partially approved denied

provided it is not exercised to the detriment of any others having existing rights, and is not contrary to the conservation of water in New Mexico nor detrimental to the public welfare and further subject to the attached conditions of approval.

Witness my hand and seal this _____ day of _____ 20 _____, for the State Engineer,

_____, State Engineer

By: _____
 Signature

 Print

Title:

FOR OSE INTERNAL USE

Application for Permit, Form wr-07

File Number:	Trn Number:
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FOR OSE INTERNAL USE

Application for Permit, Form wr-07

File Number:	Tm Number:
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KIRTLAND AIR FORCE BASE BULK FUELS FACILITY SPILL WELL SUMMARY

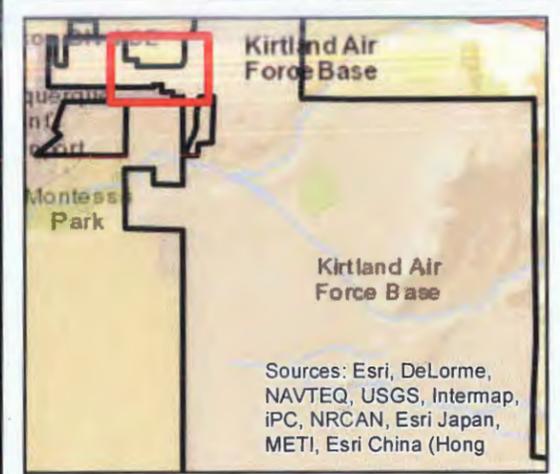
Air Sparging/SVE Well

One air sparging/SVE well, KAFB-106211 will consist of a single borehole drilled to 40 feet below the water table (approximately 510-ft bgs), with the borehole containing two installed well casings, one air sparge casing and one SVE casing. The air sparge casing will be 1 ¼ -inch-diameter, schedule 80, polyvinylchloride (PVC) riser pipe and equipped with a 0.010-inch slot, PVC screen with a 5-ft sump, and PVC bottom cap. The air sparge casing will be fitted with 5-ft screen length that will be completely submerged in the water positioned approximately 20-ft below the water table. The SVE casing will be 3-inch-diameter, schedule 80, PVC riser pipe and equipped with a 0.050 inch slot, PVC screen with a 5-ft sump, and PVC bottom cap. The SVE casing will be fitted with an 80-ft screen length that will be positioned approximately 20-ft above the water table. After the air sparge well screen and riser pipe are in place, filter pack (sand) will be placed adjacent to the well screen followed by a bentonite seal. Following placement of the SVE well screen and riser pipe, filter pack (tacna pea gravel) will be placed adjacent to the SVE well screen above the bentonite seal used for the air sparge casing. The SVE filter pack will be followed by a bentonite chip seal. For both casings, a cement/bentonite grout will extend from the upper bentonite chip seal to near ground surface. The bentonite chip seal will be hydrated in lifts using a "clean" water source.

- The borehole will be drilled to the total depth for the well to be installed using an air rotary casing hammer (ARCH) rig. Temporary surface casing to the water table may be used to stabilize the upper portion of the drill hole, but casing will be removed as filter pack and bentonite-cement grout are installed.
- The appropriate depth of the boring will be determined in the field and is dependent on the occurrence of significant water. If significant groundwater is encountered during drilling, drilling will cease, and the hole will be allowed to equilibrate for approximately 1 hour to determine the water table elevation.
- If the boring is over drilled beyond the bottom of the proposed sump elevation by more than 10 ft, the borehole will be backfilled with filter pack material to an elevation approximately 5 ft below the proposed bottom of sump elevation.
- The air sparge casing will be constructed within the borehole using a 5-ft PVC sump; Schedule 80, PVC, 0.010-inch, slotted screen; and Schedule 80, PVC blank casing to the top of the well stick-up. The sump will extend 5 ft below the bottom of the screened interval.
- While slowly removing the drill casing from the borehole, the borehole annular space will be backfilled from a maximum of 2 ft and minimum of 0.5 ft below the bottom of the air sparge casing sump to a minimum of 2 ft above the well screen with a filter pack (10/20 silica sand). A 2-ft layer of chemically inert fine sand (20/40 silica sand) will be placed directly above the filter pack. The filter pack will be placed using a tremie pipe to avoid bridging and ensure a continuous filter pack throughout the screened interval of the well. The well may be gently surged to breakup bridging and ensure complete placement of the filter pack around the well screen.

- A 26-foot hydrated bentonite seal will be emplaced above the sand filter pack, incrementally hydrated with potable water in 1-foot lifts for the first 10 feet.
- After the 26-foot hydrated bentonite seal is in place, the SVE casing will be constructed within the borehole using a 5-ft PVC sump; Schedule 80, PVC, 0.050-inch, slotted screen; and Schedule 80, PVC blank casing to the top of the well stick-up. The sump will extend 5 ft below the bottom of the screened interval.
- A 92-ft layer of filter pack (tacna pea gravel) will be placed for the filter pack of the SVE casing. A 2-ft layer of fine sand (10/20 silica sand) will be placed directly above the filter pack. The filter pack will be placed using a tremie pipe to avoid bridging and ensure a continuous filter pack throughout the screened interval of the well. The well may be gently surged to breakup bridging and ensure complete placement of the filter pack around the well screen.
- A 25-foot hydrated bentonite seal will be emplaced above the sand filter pack, incrementally hydrated with potable water in 1-foot lifts for the first 10 feet.
- A high solids (20 wt%) bentonite grout will be emplaced by tremie pipe to within 50 feet of the surface, and a cement/bentonite grout will be emplaced to the ground surface.
- A four-foot square by four-inch thick concrete surface pad shall be installed around the well immediately after the protective casing is installed. The surface pad shall be sloped so that drainage will be off the pad and away from the protective casing. In addition, a minimum of one inch of the finished pad shall be below grade or ground elevation to prevent washing and undermining by soil erosion.
- Protective casing with a locking cover shall be installed around the well casing (stickup or riser) to prevent damage or unauthorized entry. The protective casing shall be anchored in the concrete surface pad below the frost line and extend at least several inches above the casing stickup. A weep hole shall be drilled into the protective casing just above the top of the concrete surface pad to prevent water from accumulating and freezing inside the protective casing. A cap shall be placed on the well riser to prevent the entry of foreign materials into the well.
- A minimum of three bumper guards consisting of steel pipes three to four inches in diameter and a minimum of five-feet in length shall be installed next to the concrete surface pad. The bumper guards shall be installed to a minimum depth of two feet below the ground surface in a concrete footing and extend a minimum of three feet above ground surface. The pipes that form the bumper guards shall be filled with concrete to provide additional strength, and shall be painted a bright color to make them readily visible.

-11863957



-  Existing Monitoring Well KAFB-10617
-  Proposed Sparge/SVE Well KAFB-106211

KAFB Kirtland Air Force Base
 GWMW Groundwater Monitoring Well

Inset: City Areas

- | | |
|----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
|  Roads |  State Park |
|  Runway |  City Area |
|  Airport Area |  Bulk Fuels Facility |

Source: Microsoft Virtual Earth



SPARGE/SVE WELL
 BULK FUELS FACILITY
 KIRTLAND AIR FORCE BASE, NEW MEXICO

FIGURE 1

PROPOSED SPARGE/SVE WELL LOCATION
 KIRTLAND BULK FUELS FACILITY

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