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

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CERTIFIED RETURN-RECEIPT REQUESTED

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APR 24 2014

NMED
Hazardous Waste Bureau

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

~~John Hall~~ Jennifer Pruett
Program Manager
Ground Water Pollution Prevention Section
New Mexico Environment Department
PO Box 5469
Santa Fe, NM 87502

~~Dear Mr. Hall~~: Dear Ms. Pruett:

Kirtland Air Force Base (KAFB) is submitting herein one Discharge Permit Application for a LNAPL Remediation facility. Additionally, KAFB is requesting a temporary permit to complete the initial pilot program. The receipt of a temporary permit is critical to implement NAPL remediation. Working these two permits in parallel will allow the collection of pilot program data needed to inform subsequent remediation actions while the Discharge Permit Application is being reviewed and ultimately accelerate the remediation process.

Implementation of the NAPL Remediation facility will occur in two phases. The first phase will be a pilot program; the second phase will be a full scale recirculation system. During the pilot program, (performed at three to six wells) groundwater will be extracted, amended, and the amended groundwater will be re-injected (discharged) into the same well. This initial pilot program will inform the implementation of the subsequent larger scale treatment system.

The large scale remediation system will extract, amend and re-inject (discharge) into an adjacent well (approximately 500-1000 ft away). A linear group of extraction and injection wells will be used to create a bioremediation zone. During both groundwater treatment phases the amendments will be added prior to injection to enhance the anaerobic degradation of NAPL hydrocarbons and constituents of concern, and to enhance the abiotic degradation of ethylene dibromide (EDB). This Discharge Permit application lists all wells that may be utilized as part of the recirculation system; although, it is anticipated that recirculation will only be performed at approximately twelve wells at any one time.

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

TOM D. MILLER, Colonel, USAF
Commander

KAFB4135

NEW MEXICO ENVIRONMENT DEPARTMENT
GROUND WATER QUALITY BUREAU

DISCHARGE PERMIT APPLICATION

Type of Application. Check appropriate box.

X Application for new Discharge Permit -- new facility

☐ Application for new Discharge Permit -- existing (unpermitted) facility

☐ Application for Discharge Permit Renewal

☐ Application for Discharge Permit Modification
"Modification" is defined as a change to the permit requirements that result from a change in the location of the discharge, a significant increase in the quantity of the discharge, or a significant change in the quality of the discharge.

☐ Application for Discharge Permit Renewal and Modification

For an existing Discharge Permit, please indicate: DP Number _____ Expiration date _____

Checklist of Application Components.

☐ Part A: Administrative Completeness.	*Instructions for completing the application are included on the form itself and on Supplemental Instructions for Parts A and B. You may fill out the application manually, or a Microsoft Word version may be downloaded from www.nmenv.state.nm.us (Ground Water Quality) and filled out electronically.*
☐ Part B: Operational, Monitoring, Contingency and Closure Plans, with required attachments. *Choose appropriate option*: ☐ Septic Tank System ☐ General – Various Facility Types	
☐ Part C: Site Information, with required attachments.	
☐ $100 Filing Fee, payable to the New Mexico Environment Department. *Required from all applicants.* An additional fee will be assessed prior to permit issuance. Permit fees are listed in Section 20.6.2.3114 NMAC.	

Certification. Signature must be that of the person named in Item A-3 of Part A of the application.

I certify under penalty of law that I am knowledgeable about the information contained in this application. The information is, to the best of my knowledge and belief, true, accurate and complete.

Signature: Tom D. Miller Date: 17 Apr 14

Printed Name: Colonel Tom D. Miller

Title: Commander 377th Air Base Wing, Kirtland Air Force Base

Send three complete copies of this application and the filing fee to:

Program Manager
Ground Water Pollution Prevention Section
New Mexico Environment Department
PO Box 5469
Santa Fe, NM 87502

GROUND WATER DISCHARGE PERMIT APPLICATION
PART A: ADMINISTRATIVE COMPLETENESS
All Facilities

A-1. **Facility Information.** See Supplemental Instructions to determine what constitutes the "facility." The physical location of the facility must be provided. If the facility does not have an address, the location can be described by road intersections, mile posts, or landmarks, as appropriate.

Facility Name	Kirtland Air Force Base Bulk Fuels Facility LNAPL Remediation Facility
Former Names (if any)	
Physical address/location	Near the corner of Randolph Drive SE and Fuel Drive SE on Kirtland Air Force Base, NM
(mandatory)	County
Mailing address	377 MSG/CEANR
	2050 Wyoming Blvd. SE
	Kirtland AFB, NM 87117-5270
Contact person	Wayne Bitner
Title	Chief, Environmental Restoration
Telephone number(s)	505-853-3484 (Work) 505-379-3616 (Cell)
Fax number	E-mail address Ludie.Bitner@kirtland.af.mil

A-2. **Type of Discharge and Type of Facility.** See Supplemental Instructions.

Type of discharge: ☐ Domestic ☐ Agricultural **X** Industrial ☐ Mining

Type of facility: Kirtland Air Force Base is a military installation. The LNAPL Remediation facility will be used for groundwater treatment in two phases: an initial pilot scale test, and a full scale recirculation system. Groundwater wells within the NAPL plume will be used to extract groundwater. Amendments will be added to the extracted groundwater. During the pilot scale test, (performed at three to six wells) the amended groundwater will be discharged via reinjection using the same well. Once the full scale remediation system is implemented, the amended groundwater will be discharged via reinjection at a well within 1000 feet of the extraction well. During both phases the amendments will be added prior to reinjection to enhance the anaerobic degradation of NAPL hydrocarbons and constituents of concern, and to enhance the abiotic degradation of ethylene dibromide (EDB). The maximum concentrations of extracted groundwater and discharged (re-injected groundwater) are provided in A-10.

A-3. **Applicant Information.** The applicant is the person or entity (e.g., corporation, partnership, organization, municipality, etc.) legally responsible for the discharge and for complying with the terms of the Discharge Permit. If the applicant is an entity, then the name and title of a contact person must be provided. This application must be signed by the applicant or contact person named here.

Applicant Name	Kirtland Air Force Base
Mailing address	377 ABW/CC
	2000 Wyoming Blvd. SE
	Kirtland AFB, NM 87117-5606

Contact person: Colonel Tom D. Miller

Title: Commander 377th Air Base Wing, Kirtland Air Force Base

Telephone number(s): 505-846-7377

Fax number: _____ E-mail address: _____

A-4. Consultant Information (if applicable). If the consultant is a company or organization, then the name and title of a contact person must be provided.

Consultant/Firm Name: CB&I Federal Services, LLC

Mailing address: 6380 S. Fiddlers Green Circle, Suite 300
Greenwood Village, CO 80111

Contact person: Michael Amdurer

Title: Director

Telephone number(s): 303-486-2503 (Work) 303-513-1155 (Cell)

Fax number: 720-554-8298 E-mail address: mike.amdurer@cbifederalservices.com

A-5. Permit Contact Information (if applicable). If someone other the applicant listed in Item A-3 or a consultant listed in Item A-4 is a primary contact for this application and/or facility, list here.

Permit Contact Name: Wayne Bitner

Title: Chief, Environmental Restoration

Mailing address: 377 MSG/CEANR
2050 Wyoming Blvd. SE
Albuquerque, NM 87117-5270

Telephone number(s): 505-853-3484 (work)

Fax number: _____ E-mail address: ludie.bitner@kirtland.af.mil

A-6. Ownership.

The applicant owns (check as appropriate): **X** the facility ☐ some discharge sites **X** all discharge sites

If other parties own the facility or any of the discharge sites, attach their names and contact information.

A-7. Discharge Quantity.

Your Discharge Permit will specify a maximum discharge volume, which is typically expressed as the maximum number of gallons per day that may be treated and/or disposed of. Please indicate below the maximum discharge volume for your facility. You must show how it was determined in Part B of your application. For further explanation, see Supplemental Instructions for Part B.

Maximum discharge volume: During full recirculation, 50 gpm per well at up to six wells

A-8. Processing, Treatment, Storage and Disposal System. Briefly describe how wastewater, sludge, etc. is processed, treated, stored, and/or disposed of at your facility. See Supplemental Instructions for examples of system components.

Groundwater bioremediation will be initiated using a groundwater recirculation system. Groundwater wells from the NAPL plume south of Ridgecrest Road will be used to extract groundwater. First a pilot scale test will be performed at three to six wells were groundwater will be extracted, amended, and the amended groundwater will be discharged into the same well. The nature and quantity of the amendments will be based on preliminary lab bench-scale tests and the pilot scale test. A list of potential amendments is provided in Attachment A-10. After the pilot scale test, a full scale remediation system will be implemented with groundwater extracted, amended, and discharged into an adjacent well (approximately 500-1000 feet away).

A-9. Discharge Locations. List the locations of your facility and of all components of your processing, treatment, storage and/or disposal system. Examples of components include septic tanks, lagoons, leachfields, irrigation sites, mine stockpiles, etc. Additional examples are listed in the Supplemental Instructions. Latitude and longitude are optional unless township, range and section are not available.

Groundwater extraction, amendment addition, and reinjection will be localized, occurring in the same area. Not all wells listed will be used for pilot scale testing and the full-scale recirculation system. Wells identified are possible locations for extraction and injection. Coordinates provided are Longitude and Latitude, Central New Mexico, US Survey Feet.

Components	Township	Range	Section(s)	Latitude	Longitude
Wells Identified for Pilot Scale Testing					
KAFB-106010 (extraction and injection well)	T10N	R3E	S36	35.053051°	-106.577339°
KAFB-106012R (extraction and injection well)	T10N	R3E	S36	35.051059°	-106.580544°
KAFB-106017 (extraction and injection well)	T10N	R3E	S36	35.054341°	-106.575765°
KAFB-106067 (extraction and injection well)	T10N	R3E	S36	35.052933°	-106.576368°
KAFB-106094 (extraction and injection well)	T10N	R3E	S36	35.052910°	-106.578477°
KAFB-106210 (extraction and injection well)	T10N	R3E	S36	35.051172°	-106.577994°
Wells Identified for Recirculation System (Figures C3 through C5)					
KAFB-1061(extraction or injection well)	T10N	R3E	S36	35.049801°	-106.580971°
KAFB-1062 (extraction or injection well)	T10N	R3E	S36	35.050971°	-106.582013°
KAFB-1063 (extraction or injection well)	T10N	R3E	S36	35.050987°	-106.584125°
KAFB-1064 (extraction or injection well)	T10N	R3E	S36	35.051930°	-106.582054°
KAFB-1065 (extraction or injection well)	T10N	R3E	S36	35.050951°	-106.579166°
KAFB-1066 (extraction or injection well)	T10N	R3E	S36	35.049023°	-106.578301°
KAFB-1067 (extraction or injection well)	T10N	R3E	S36	35.047923°	-106.577689°
KAFB-1068 (extraction or injection well)	T10N	R3E	S36	35.050052°	-106.578239°
KAFB-1069 (extraction or injection well)	T10N	R3E	S36	35.051296°	-106.578996°
KAFB-10610 (extraction or injection well)	T10N	R3E	S36	35.053051°	-106.577339°
KAFB-10611 (extraction or injection well)	T10N	R3E	S36	35.051016°	-106.576122°
KAFB-10613 (extraction or injection well)	T10N	R3E	S36	35.052973°	-106.579910°
KAFB-10614 (extraction or injection well)	T10N	R3E	S36	35.051007°	-106.577455°

KAFB-10616 (extraction or injection well)	T10N	R3E	S36	35.048648°	-106.582213°
KAFB-10617 (extraction or injection well)	T10N	R3E	S36	35.054341°	-106.575765°
KAFB-10618 (extraction or injection well)	T10N	R3E	S36	35.054889°	-106.577430°
KAFB-10619 (extraction or injection well)	T10N	R3E	S36	35.052922°	-106.575586°
KAFB-10620 (extraction or injection well)	T10N	R3E	S36	35.054715°	-106.579290°
KAFB-10624 (extraction or injection well)	T10N	R3E	S36	35.049632°	-106.580210°
KAFB-10627 (extraction or injection well)	T10N	R3E	S36	35.046557°	-106.580683°
KAFB-10628 (extraction or injection well)	T10N	R3E	S36	35.051867°	-106.577740°
KAFB-106038 (extraction or injection well)	T10N	R3E	S36	35.053886°	-106.574458°
KAFB-106039 (extraction or injection well)	T10N	R3E	S36	35.053896°	-106.574373°
KAFB-106040 (extraction or injection well)	T10N	R3E	S36	35.053956°	-106.574431°
KAFB-106044 (extraction or injection well)	T10N	R3E	S36	35.046476°	-106.580664°
KAFB-106045 (extraction or injection well)	T10N	R3E	S36	35.046555	-106.580765°
KAFB-106046 (extraction or injection well)	T10N	R3E	S36	35.049878°	-106.576041°
KAFB-106047 (extraction or injection well)	T10N	R3E	S36	35.049868°	-106.576230°
KAFB-106048 (extraction or injection well)	T10N	R3E	S36	35.049919°	-106.576145°
KAFB-106059 (extraction or injection well)	T10N	R3E	S36	35.050083°	-106.579767°
KAFB-106060 (extraction or injection well)	T10N	R3E	S36	35.050023°	-106.579692°
KAFB-106061 (extraction or injection well)	T10N	R3E	S36	35.050080°	-106.579641°
KAFB-106062 (extraction or injection well)	T10N	R3E	S36	35.050379°	-106.577549°
KAFB-106063 (extraction or injection well)	T10N	R3E	S36	35.050309°	-106.577595°
KAFB-106064 (extraction or injection well)	T10N	R3E	S36	35.050377°	-106.577637°
KAFB-106065 (extraction or injection well)	T10N	R3E	S36	35.051849°	-106.577880°
KAFB-106066 (extraction or injection well)	T10N	R3E	S36	35.051989°	-106.577742°
KAFB-106067 (extraction or injection well)	T10N	R3E	S36	35.052933°	-106.576368°
KAFB-106068 (extraction or injection well)	T10N	R3E	S36	35.052959°	-106.576448°
KAFB-106069 (extraction or injection well)	T10N	R3E	S36	35.052886°	-106.576440°
KAFB-106073 (extraction or injection well)	T10N	R3E	S36	35.054423°	-106.578207°
KAFB-106074 (extraction or injection well)	T10N	R3E	S36	35.054373°	-106.578284°
KAFB-106075 (extraction or injection well)	T10N	R3E	S36	35.054340°	-106.578178°
KAFB-106076 (extraction or injection well)	T10N	R3E	S36	35.048808°	-106.579468°
KAFB-106077 (extraction or injection well)	T10N	R3E	S36	35.048764°	-106.579529°
KAFB-106078 (extraction or injection well)	T10N	R3E	S36	35.048805°	-106.579580°
KAFB-106079 (extraction or injection well)	T10N	R3E	S36	35.051173°	-106.577994°
KAFB-106080 (extraction or injection well)	T10N	R3E	S36	35.051040°	-106.578112°
KAFB-106081(extraction or injection well)	T10N	R3E	S36	35.051168°	-106.578202°
KAFB-106082(extraction or injection well)	T10N	R3E	S36	35.054626°	-106.576943°
KAFB-106083(extraction or injection well)	T10N	R3E	S36	35.054644°	-106.577095°
KAFB-106084 (extraction or injection well)	T10N	R3E	S36	35.054692°	-106.576987°
KAFB-106094(extraction or injection well)	T10N	R3E	S36	35.052910°	-106.578477°
KAFB-106095 (extraction or injection well)	T10N	R3E	S36	35.052977°	-106.578527°
KAFB-106096 (extraction or injection well)	T10N	R3E	S36	35.052903°	-106.578576°
KAFB-106097 (extraction or injection well)	T10N	R3E	S36	35.052970°	-106.579827°
KAFB-106098 (extraction or injection well)	T10N	R3E	S36	35.053051°	-106.579839°

KAFB-106099 (extraction or injection well)	T10N	R3E	S36	35.051913°	-106.582133°
KAFB-106100 (extraction or injection well)	T10N	R3E	S36	35.051843°	-106.582089°
KAFB-106101 (extraction or injection well)	T10N	R3E	S36	35.051044°	-106.584074°
KAFB-106102 (extraction or injection well)	T10N	R3E	S36	35.051047°	-106.584177°
KAFB-3411 (extraction or injection well)	T10N	R3E	S36	35.050482°	-106.581357°
Additional 20 wells may be installed. The area where additional wells may be installed is shown in Figure A-1.					

Coordinates provided are Latitude and Longitude, Central New Mexico, US Survey Feet.

A-10. Discharge Quality.

Indicate the expected quality of the discharge -- wastewater, leachate, sludge, etc. -- generated, stored, treated, processed and/or discharged at your facility. List the contaminants of concern and the expected concentrations. *Not all facilities need to characterize influent quality.* See Supplemental Instructions for typical contaminants and additional guidance.

Expected or Known Contaminants	**Maximum Concentration[1]** Indicate units: mg/L, CFU/100 ml, etc.	
	Extracted Groundwater (Influent)	**Discharged/Injected Groundwater (Effluent)**
Total petroleum hydrocarbons, gasoline range organics	72,000 µg/L	72,000 µg/L
Total petroleum hydrocarbons, diesel range organics	250,000 µg/L	250,000 µg/L
Benzene	16,000 µg/L	16,000 µg/L
Ethylene dibromide	370 µg/L	370 µg/L
Iron	8,100 µg/L	8,100 µg/L
Manganese	7,600 µg/L	7,600 µg/L
Toluene	19,000 µg/L	19,000 µg/L
1,2,4-Trimethylbenzene	640 µg/L	640 µg/L
Total xylenes	4,600 µg/L	4,600 µg/L
Naphthalene	470 µg/L	470 µg/L
Bioremediation amendments[2]	0 µg/L	> 0 µg/L [3]

[1] The concentrations listed are the historical maximum observed concentration during quarterly groundwater monitoring since Third Quarter CY 2011, when the majority of the monitoring wells south of Ridgecrest Road had been installed.
[2] In addition to the known contaminants in the groundwater, amendments to enhance bioremediation will be added to the water prior to reinjection. The exact list of amendments and maximum concentrations will be provided after the bench-scale testing is completed.
[3] A list of possible amendments and their maximum concentrations is provided as Attachment A-10. This is an exhaustive list of possible amendments which will be used in bench-scale testing; all amendments will not be added simultaneously. Based on the results of bench-scale testing, a subset will be used during the single-well pilot scale test and full-scale implementation.

For **new** septic tank systems, you may either fill out the chart above or simply check one of the following options:

- ☐ typical domestic wastewater
- ☐ low-strength domestic wastewater (large gray water component; e.g., laundromat, spa, etc.)
- ☐ high-strength domestic wastewater (low water use; e.g., RV park, low-flow toilets at campground, etc.)

A-11. Ground Water Conditions.

All applicants must provide the depth to and pre-discharge TDS concentration of the ground water that could be affected by the discharge. Refer to Supplemental Instructions for details on how to obtain these values.

Indicate the depth to the most shallow ground water beneath the discharge site. If there are multiple discharge sites, indicate the range of depths.	Indicate pre-discharge total dissolved solids (TDS) concentration of most shallow ground water beneath the discharge site. Attach copies of analyses.
Depth to water (feet): 490 Reference:	TDS (mg/L): 445 Reference:

X Measurement, nearby monitoring well KAFB-106079, which is approximately at the center of the historical NAPL area. ☐ Measurement, nearby supply well ☐ Well log from nearby well (attach copy) ☐ Office of the State Engineer http://www.ose.state.nm.us/ ☐ Report or study (give citation here and attach relevant portion): ☐ Other (describe):	**X** Analysis from upgradient monitoring well KAFB-106157, which is approximately 100 feet north of the historical NAPL area, and 300 feet south of Ridgecrest road. ☐ Analysis from on-site supply well ☐ Analysis from shallow nearby supply well ☐ Concentration provided in previous Discharge Permit application ☐ Report or study (give citation here and attach relevant portion): ☐ Other (describe):

A-12. Public Notice. See Supplemental Instructions.

a) The public notice packet including instructions and materials should be sent to:

☐ Applicant **X** Consultant ☐ Other: Michael Amdurer
CB&I Federal Services, LLC
2440 Louisiana Blvd. NE, Suite 300
Albuquerque, NM 87110

b) Copies of the public notice packet (excluding sign) should be sent to:

☐ Applicant **X** Consultant ☐ Other: Michael Amdurer
CB&I Federal Services, LLC
2440 Louisiana Blvd. NE, Suite 300
Albuquerque, NM 87110

c) The applicant is required to provide public notice of this application by placing a display ad in a newspaper of general circulation near the location of the proposed discharge. Indicate newspaper you intend to place the ad in:

Newspaper: *Albuquerque Journal; legal notice of at least 3 inches by 4 inches using wording provided by the NMED and in compliance with the requirements of 20.6.2.3108 NMAC.*

d) *For new or modification applications only:* The applicant must post a sign for 30 days in a conspicuous location at or near the facility, as approved by NMED. One sign must be posted for each 640 contiguous acres or less of the discharge site. An additional notice must be posted at an off-site location conspicuous to the public. Describe the locations below where you intend to post the notices. You may also attach sketches or photographs.

At or near facility: Near the corner of Randolph Drive SE and Fuel Drive SE on Kirtland Air Force Base, NM
2 by 3 feet in size Coordinates- X: 356160.03, Y: 3879772 in WGS 1984 UTM Zone 13N

Off-site location: Written public notice will be distributed to owners of record within 1/3 of a mile of the
flyer size proposed facility boundary; wording to be provided by the NMED .
Off-site location and notice to be determined by NMED

Supplemental Instructions for Part A

All Facilities

Please note: Discharge Permits are required for a wide range of facilities that process, treat, store and/or dispose of wastewater, sludge, septage, leachate, contaminated soils, mine tailings, industrial waste, mine ore, waste rock, or other similar materials. For the purposes of this application form, the term "discharge" applies to any of these materials whether they are actually discharged or whether they represent only a potential discharge that could occur due to factors such as poor maintenance, improper installation, equipment failure or accidents.

A-1. Facility Information.

The "facility" may be identified as:

a) a treatment facility, such as a municipal wastewater treatment plant;
b) the source of the discharge, such as a subdivision, dairy, or waste rock pile;
c) a disposal facility or operation, such as for sludge or septage;
d) the discharge location or recipient of reclaimed wastewater for reuse, such as a golf course or cement plant;
e) a storage and/or processing facility with off-site disposal;

f) a collection of facilities, such as numerous comfort stations at a state park; or
g) a project or operation, such as a construction project or a system to distribute reclaimed wastewater throughout a city.

A-2. Type of Discharge and Type of Facility.

Characterize the type of discharge, wastewater, sludge, leachate, etc. generated, processed or received by your facility as domestic, agricultural, industrial or mining. Examples of a variety of facility types are categorized below.

Domestic Waste

"Domestic" waste contains human excreta or originates from typical residential plumbing fixtures.

- Municipal wastewater treatment plant
- Septage disposal
- Sludge disposal
- Mobile home/RV park
- Campground/park
- School/educational facility
- Restaurant
- Subdivision/apartment complex
- Unincorporated community
- Lodging/resort/spa
- Residential facility
- Commercial/shopping complex
- Laundromat
- Facility using reclaimed domestic wastewater

Agricultural Waste

- Dairy
- Food processing
- Slaughter facility
- Nursery/greenhouse
- Manufacture/processing of agricultural chemicals
- Feedlot
- Livestock truck washout

Industrial Waste

- Manufacturing
- Power plant
- Military installation
- Vehicle/equipment wash
- Mortuary
- Hydrocarbon landfarm
- Ground water remediation
- Ethanol plant
- Asphalt plant

Mining Waste

- tailing impoundment
- mine dewatering
- waste rock pile
- smelter slag
- in-situ leach
- leach piles
- pipelines
- collection ponds
- concentrator – other beneficiation

This listing is only a guide, as there can be crossover between categories. For example, a golf course might use treated industrial wastewater for irrigation. The type of facility in that case is "golf course" and the type of waste is "industrial." A mining operation may need a permit for its restroom and shower facilities. In that case, the type of facility is a "mining operation" and the type of discharge is "domestic waste."

A-7. Discharge Quantity.

Refer to the Supplemental Instructions for Part B for information on how to calculate the maximum discharge volume for your facility.

A-8 and A-9. Treatment, Storage, Disposal System.

The following are examples of treatment, storage and disposal methods:

Treatment Methods

- Septic tank
- Grease interceptor
- Oil/water separator
- Manure separator
- Wetlands
- Lagoon (indicate whether aerated and type of liner)
- Trickling filter
- Activated sludge (extended air, SBR, etc.)
- Sand filter
- Membranes
- Sludge drying bed
- Disinfection (specify type)
  - chlorination
  - UV/ozone
- Water treatment plant

Storage Methods

- Above/below ground tank
- Storage lagoon (indicate type of liner)
- Holding tank
- Pit toilet
- Stockpile
- Tailing impoundment

Disposal Methods

- Leachfield
- Infiltration gallery
- Evaporation lagoon (indicate type of liner)
- Evaporation tank
- Impoundment
- Discharge to waters of the US (NPDES permit required)
- Ongoing land application (specify type)
  - subsurface irrigation
  - sprinkler irrigation
  - flood irrigation
  - drip irrigation
  - surface spreading (solids)
  - surface injection (solids)
- Temporary uses of reclaimed wastewater
- Ongoing use of reclaimed wastewater for:
  - manufacturing
  - construction or dust control

A-9. Discharge Quality.

Untreated wastewater entering a treatment facility (also referred to as "influent") must be characterized so that the treatment process can be evaluated. It is not necessary to provide influent quality for systems providing minimal treatment prior to discharge or disposal, such as systems relying on crop uptake for treatment (e.g., dairies), septic tank – leachfield systems, storage/processing facilities or evaporative systems. The final quality of the waste or wastewater disposed of or discharged must be characterized for all facilities.

For most agricultural and domestic facilities, the contaminants of concern include nitrate as nitrogen (NO_3-N), total Kjeldahl nitrogen (TKN), total dissolved solids (TDS), and chloride (Cl). For domestic facilities with advanced treatment, additional contaminants include total suspended solids (TSS), biochemical oxygen demand (BOD_5), and fecal coliform bacteria. Contaminants of concern at industrial and mining sites include pH, metals, and organic compounds. List all that apply.

A-10. Ground Water Conditions.

The depth to ground water beneath your facility and/or discharge site must be provided. This is true even if your facility or operation is intended to have no discharge. Discharge Permits are required for "no-discharge" lagoons, storage tanks, etc. because of the potential for a discharge to occur due to factors such as improper installation, poor maintenance, equipment failure or accidents.

The best way to determine the depth to water is to measure it in an on-site or nearby monitoring well. If a monitoring well is not available, the measurement may be from a water supply well. If there is a well but it is not possible to access it for a measurement, you could refer to the well log for that well and/or others in the vicinity. Well log information is available on the website of the State Engineer's office:

http://www.ose.state.nm.us/.

Be aware that water levels have dropped in many areas of the state, so more recent well logs in those areas are more reliable.

There may be a significant discrepancy in the depth to water in different wells, even when falling water levels is not a factor. One reason for this is that a water supply well may rely on a deep aquifer rather than water in the "first" or most shallow aquifer. Discharge Permits are intended to protect all ground water, so it is important to report the most shallow depth in the vicinity of your site.

The total dissolved solids (TDS) concentration of the ground water prior to discharge must be provided. As explained for the depth to water, this is true even if your facility or operation is intended to have no discharge. The TDS value provides a general indication of the quality of the ground water that could be affected by your operation.

The best way to obtain a pre-discharge TDS concentration is to sample an on-site or nearby well before your facility begins operating. It is better to sample a shallow rather than a deep well, if possible. It may be that a neighboring facility has existing analytical data for its Discharge Permit. (If so, be sure to obtain data from a non-impacted well.)

If there are no wells in your vicinity or it is not possible to sample them, you may find general TDS concentrations in reports available from sources such as a university, the State Engineer's Office (http://www.ose.state.nm.us/) or the US Geological Survey (http://nm.water.usgs.gov/). If you are renewing or modifying your Discharge Permit, you may refer to the TDS concentration previously determined if there was a sound basis for it. Monitoring data or other information obtained since the permit was issued, however, may warrant listing a different value.

A-12. Public Notice.

The latest revision of 20.6.2.3108 NMAC, which specifies the applicant's public notice requirements, is effective as of July 16, 2006. Once NMED has determined that your application is administratively complete, **the instructions and materials necessary to complete the public notice requirements will be sent to you.**

GROUND WATER DISCHARGE PERMIT APPLICATION
PART B: OPERATIONAL, MONITORING, CONTINGENCY AND CLOSURE PLANS GENERAL FORM (VARIOUS FACILITY TYPES)

Operational Plan *[Section 20.6.2.3106.C, 3109.C NMAC]*

B-1. Source(s) of the Discharge. Describe what generates the wastewater, sludge or other discharges processed and/or disposed of at your facility. Identify all sources. Attach additional pages, if needed. See Supplemental Instructions.

In 1999, the Kirtland Air Force Base (KAFB) Bulk Fuels Facility (BFF) discovered a below-grade line leakage along the offloading rack. The three types of fuel handled by the BFF were aviation fuel (AvGas; high-octane gasoline), Jet Propellant-4 fuel (JP-4), and JP-8. These fuels are the likely constituents of the NAPL plume spreading north-northeast of the BFF. Water from the NAPL plume will be pumped from existing wells south of Ridgecrest Road; locations are listed in Section A-9 of this permit application.

B-2. Discharge Quantity. Describe the methods/calculations used to determine the maximum discharge volume listed in Item A-6 in Part A of your application. Attach additional pages, if needed. See Supplemental Instructions.

The discharge quantity will be based on laboratory bench-scale tests, a single well push/pull test, and groundwater modeling. The discharge quantity will be estimated and provided when the final design is submitted following work plan approval by the NMED Hazardous Waste Bureau. The discharge quantity is not expected to exceed 50 gpm at up to six wells for up to six months.

B-3. Site Map. Attach a site map showing the components of your proposed system and relevant surrounding features, clearly labeled, such as:

- treatment units
- lagoons
- tanks
- sumps
- manure separators
- land application fields
- domestic wastewater reuse areas
- pits
- stockpiles
- leachfields
- sludge drying beds
- roads
- buildings
- supply wells
- monitoring wells
- extraction/injection wells
- arroyos
- nearby water bodies such as ponds or canals
- property boundaries
- other permitted discharges
- required setbacks
- north arrow

If map is not to scale, mark distances on the map.
X Site map is attached as Figure B-3.

B-4. Flood Protection. Describe the methods used to prevent flooding and run-off at the facility (tank protection, berms, diversion channels, etc.)

Flood protection will be described in detail when the final certified design is submitted following work plan approval by the NMED HWB.

B-5. Plans and Specifications. For new facilities and for new components of existing systems, attach plans and specifications certified by a New Mexico registered professional engineer. *[Section 20.6.2.1202 NMAC]*

☐ Not applicable because no new facilities are proposed.

X Plans and specifications are attached Attached is the preliminary design. The final certified design will be based on the results of laboratory bench-scale tests, a single-well push/pull test, and groundwater modeling. The final certified design will be submitted when the work plan is approved by the NMED HWB.

☐ Plans and specifications were previously submitted. Submittal date(s): _____

B-6. **Description of Components.** Provide descriptive details of all components of your processing, treatment, storage and/or disposal system. Include all components listed under Item A-8 in Part A.

Component	Description (construction material, liner type, irrigation method, capacity, dimensions, area, etc.)
See notes below this table.	

Components will be described in detail when the final certified design is submitted following work plan approval by the NMED HWB.

B-7. **Operational Plan.** Attach a detailed description of how you operate your processing, treatment, storage and/or disposal system.

Animal feeding operations: include stormwater management, nutrient management plans, method for mixing irrigation and wastewater.

Domestic wastewater treatment facilities: include pre-treatment, solids management, vegetation management for land application.

Facilities using reclaimed domestic wastewater above ground: include proposed water quality classification(s), effluent monitoring, setbacks, irrigation schedules, etc. that will result in protection of public health and the environment. Please refer to *NMED Ground Water Quality Bureau Guidance: Above-Ground Use of Reclaimed Domestic Wastewater* for further information. A copy of the guidance document is available on the NMED website www.nmenv.state.nm.us under "Ground Water Quality".

X Operational plan is described below.

☐ Operational plan was previously submitted. Submittal date(s): _____

The operational plan will be described in detail when the final certified design is submitted following work plan approval by the NMED HWB.

B-8. **System Maintenance**. Attach a description of the operations and maintenance procedures which ensure that your processing, treatment and disposal system functions properly; e.g., inspections, pumping schedules, equipment maintenance, etc.

X O & M procedures are described below.
☐ O & M procedures were previously submitted. Submittal date(s): _____

The O&M procedures will be described in detail when the final certified design is submitted following work plan approval by the NMED HWB.

B-9. **Backflow Prevention.** If wastewater is used for land application or irrigation, describe methods used to protect wells from contamination by wastewater backflow. For new facilities or new systems at an existing facility, only air gap or reduced pressure valve assemblies are acceptable methods.

a) Clearly describe and/or sketch the location of air gaps or devices and attach specifications.

Not Applicable.

b) Describe how devices are maintained.

Not applicable.

B-10. **Water Rights.** Animal feeding operations which land apply wastewater must attach documentation of irrigation water rights for the proposed land application fields, sufficient to sustain the intended crop rotation.

☐ Water right documentation is attached.

X Not applicable.

B-11. **Past Ground Water Monitoring Results**. *This item applies only to existing facilities seeking renewal and/or modification of a Discharge Permit that required ground water monitoring.*

Not Applicable.

a) Attach a graph or a table showing all analytical results from ground water sampling at your facility. If preparing graphs, a separate graph should be developed for each constituent, except that nitrate and TKN may be shown on the same graph. Multiple wells may be shown on the same graph. See Supplemental Instructions for sample table and graph.

b) If the monitoring results indicate that ground water standards have been violated or that there is an upward trend approaching standards, attach a description of what actions you have taken or will take to address the elevated concentrations. Ground water standards are listed in Section 20.6.2.3103 NMAC. See the Supplemental Instructions for frequently referenced standards.

Monitoring Plan *[Section 20.6.2.3107.A NMAC]*

B-12. **Discharge Volumes.** Describe how and where the monthly discharge volume at your facility will be. For all measuring devices, provide type, location, and units of measure including multipliers (e.g., gallons, gallons x 100, acre-ft, etc.) See Supplemental Instructions. Attach additional pages, if necessary.

Discharge water with amendments added will be injected into existing wells south of Ridgecrest Road. Flow meters will be used on each injection well to monitor the volume of water injected.

B-13. **Discharge Quality Monitoring.** Discharge Permits typically require that the discharge (treated wastewater, sludge, septage, etc.) be sampled on a regular basis. The frequency of sampling varies by type of facility, as do the contaminants of concern. Domestic and agricultural Discharge Permits typically require sampling for total Kjeldahl nitrogen (TKN), nitrate-nitrogen (NO_3-N), total dissolved solids (TDS) and chloride on a quarterly or semi-annual basis. *(continued on next page)*

If reclaimed domestic wastewater will be discharged for above ground uses, testing of the discharge for additional parameters is appropriate. Please refer to the *NMED Ground Water Quality Bureau Guidance: Above-Ground Use of Reclaimed Domestic Wastewater* for further information.

In the space below, provide a description or sketch of the sampling point(s) to be used for sampling the discharge at your facility.

The final certified design will be submitted following work plan approval by the NMED HWB and will include a detailed sampling plan.

Optional: In the space below (or as an attachment), you may propose revisions or additions to the standard discharge quality monitoring requirements. If you do, provide the rationale for your proposal.

Not applicable.

B-14. **Ground Water Quality Monitoring.** Discharge Permits typically require that ground water samples be collected quarterly from properly constructed monitoring wells located downgradient from discharge locations. The samples must be analyzed for contaminants of concern. For most domestic and agricultural Discharge Permits, the typical contaminants of concern are total Kjeldahl nitrogen (TKN), nitrate-nitrogen (NO_3-N), total dissolved solids (TDS) and chloride.

Optional: In the space below (or as an attachment), you may propose revisions or additions to the standard ground water monitoring requirements. If you do, provide the rationale for your proposal.

As required by the NMED HWB, Kirtland AFB performs quarterly groundwater monitoring of the SWMU SS-111 wells. The wells are located both upgradient and downgradient of the proposed discharge location. Groundwater sampling consists of measuring groundwater and NAPL levels; use of NMED HWB-approved well purging techniques; and collection of representative groundwater samples for field parameters and offsite laboratory analysis. The offsite laboratory performs analysis for the following analytes:

- VOCs - SW846 8260B (EPA, 2007)
- EDB – SW846 8011 (EPA, 2007)
- TPH gasoline/diesel range organics - SW846 8015B [modified] (EPA, 2007)
- Volatile petroleum hydrocarbon (VPH) /extractable petroleum hydrocarbon (EPH) – Massachusetts Department of Environmental Protection (MA DEP) (4 quarters only for risk assessment purposes) (MA DEP, 2004a,b)
- Cations (calcium, potassium, magnesium, sodium) - SW846 6010C (EPA, 2007)
- Lead - SW846 6010C (EPA, 2007)
- Dissolved iron and manganese - SW846 6010C (EPA, 2007)
- Anions (chloride, sulfate, nitrate) - EPA 300.0 (EPA, 1993)
- Ammonia nitrogen - SM 4500B,D (American Water Works Association [AWWA], 2005)
- Alkalinity (carbonate and bicarbonate) - SM 2320B (AWWA, 2005)
- Total sulfide - SM 4500 S-2CF (AWWA, 2005)

For existing facilities:

Indicate number of existing monitoring wells: 115

Attach copies of monitoring well logs.

☐ Well logs attached. ☐ Well logs cannot be located.

X Well logs previously submitted. Submittal date(s): 2011 through 2012

Well logs and completion diagrams have been submitted quarterly to the NMED HWB as part of the Quarterly Pre-Remedy Monitoring and Site Investigation Reports for the Bulk Fuels Facility Spill, Solid Waste Management Units SS-111 and ST-106. KAFB-10612 and KAFB-10210 will be installed in late April 2014. Well logs will be submitted for these wells once they are installed.

Attach copy of monitoring well survey (typically not applicable if fewer than 3 monitoring wells).

☐ Survey attached. ☐ No survey has been conducted.

X Survey previously submitted. Submittal date(s): 2011 through 2013

Monitoring well surveys have been submitted quarterly to the NMED HWB as part of the Quarterly Pre-Remedy Monitoring and Site Investigation Reports for the Bulk Fuels Facility Spill, Solid Waste Management Units SS-111 and ST-106. KAFB-10612 and KAFB-10210 will be installed in late April 2014. Survey coordinates will be submitted for these wells once they are installed.

B-15. Other Monitoring. In addition to discharge volumes, discharge quality monitoring and ground water sampling, Discharge Permits typically require the following monitoring, depending on the type of facility:

- inspection and pumping of septic tanks, grease tanks, lift stations
- inspection of leachfields
- inspection of lagoons
- process testing for treatment plants
- land application data sheets (LADS)
- tracking of chemical fertilizer applications to land application areas
- soil sampling (agricultural and selected other facilities land applying wastewater)
- harvested plant material testing (agricultural facilities)

Optional: In the space below (or as an attachment), you may propose revisions or additions to the other standard monitoring requirements for your type of facility. If you do, provide the rationale for your proposal.

Not applicable.

Contingency Plan *[Section 20.6.2.3107.A.10 NMAC]*

B-16. System Failure. Describe your contingency plan in the event there is a failure of your wastewater or discharge system (e.g., wastewater back-up, pump failure, pipe breaks, tank overflow, leachfield failure, saturated fields etc.)

If alarm conditions exist, required maintenance will be scheduled to address the issue. The contingency plan containing the standard contingencies (B-18) will be described in detail when the final certified design is submitted following work plan approval by the NMED HWB.

B-17. Contingency Leachfield Location. *This item applies only if your disposal system includes a leachfield.* Identify a location on your site map (Item B-3) for a contingency leachfield in the event that your leachfield must be replaced. If no land is available for a contingency leachfield at an existing facility, describe how you will address a failed leachfield. New facilities must provide for a contingency leachfield location.

Not Applicable.

B-18. Other Contingencies. Discharge Permits typically contain standard contingencies to address:

- exceeding wastewater quality limits
- violation of ground water or surface water standards
- spills or illegal releases of wastewater
- migration of soil nitrogen
- loading nitrogen above limit

Propose additional contingency plans, if appropriate:

Not applicable. The contingency plan containing the standard contingencies will be described in detail when the final certified design is submitted following work plan approval by the NMED HWB.

Closure Plan *[Section 20.6.2.3107(A)11 NMAC]*

B-18. Facility Closure and Post-Closure Monitoring. Discharge Permits contain standard requirements to address the closure of part or all of your discharge system, as follows:

- cap or plug lines to prevent the flow of wastewater to treatment or disposal system
- empty and remove or backfill tanks
- empty lagoons, perforate or remove liners, re-grade to surface topography
- appropriately dispose of solids
- regrade and cover stockpiles at mine facilities
- continue ground water monitoring for at least two years, longer as appropriate
- enact contingency plans if ground water standards are violated
- financial assurance may be required.

Propose additional closure plans in the space below or as an attachment, if appropriate:

Facility closure will follow completion of RCRA corrective actions, and will be performed in accordance with RCRA post closure monitoring requirements. Oversight will be performed by the NMED HWB.

Please Note: You must also complete Part C of the application.

Supplemental Instructions for Part B – General Form

B-1. Source(s) of the Discharge.

Be specific in describing all sources. Consider the following examples:

- Municipalities – identify particular industries or specialized facilities contributing wastewater.
- RV Parks – identify showers, dump stations, laundromat, etc.
- Subdivisions – identify homes, apartments, commercial developments, water softener backwash, etc.
- Landfarms or disposal facilities – specify type of materials accepted, e.g., residential septage, car wash grit trap waste, contaminated soils/water, treated municipal sludge, etc.
- Dairies – identify milking parlors, type of washdown used, sources of stormwater runoff, etc.
- Schools – identify cafeteria, gym, showers, etc.
- Truck stops – identify restaurant, showers, car wash, etc.
- Facilities receiving reclaimed wastewater – identify the treatment facility providing the reclaimed wastewater.
- Food processing and industrial facilities – describe the processes which produce the waste stream and chemicals used.
- Mines – identify processes including beneficiation, tailing, waste rock, leach facilities, pipelines, ponds, catchments, booster stations, in-situ leach facilities.

You do not need to include solid wastes, hazardous wastes or discharges being managed under other permits; however, these should be listed under Item C-7 in Part C of the application.

B-2. Discharge Quantity.

Your Discharge Permit will allow for the treatment, processing and/or discharge of up to a specified volume, generally, a maximum number of gallons per day. The flow at your facility on any given day must not exceed this "maximum discharge volume." It is determined based on the expected contributions from the sources you identified in Item B-1.

NMED will carefully review the basis of the maximum discharge volume you propose. Show all your calculations and assumptions.

Animal feeding operations must provide calculations based on the number of animals and water conservation practices in place.

Landfarms, disposal facilities, processing facilities typically identify the expected number of loads to be delivered.

For septic systems and wastewater treatment plants, the maximum discharge volume is also referred to as the "design flow." It includes a peaking or safety factor to guard against back-ups and overflows.

Municipal wastewater treatment facilities should identify the population served, growth assumptions, and expected per capita usage considering any contributing industries.

On-site domestic wastewater treatment facilities should rely on published design flows such as those provided in the NMED Liquid Waste Regulations (20.7.3 NMAC), the Uniform Plumbing Code or the USEPA On-site Wastewater Treatment Systems Manual.

For existing facilities, the maximum discharge volume may be based on a record of measured flows if no changes are anticipated. At least two years of flow data must be submitted, and the highest monthly discharge volume must be multiplied by a peaking factor of 1.5.

NMED will verify that your proposed or existing facility can handle maximum discharge volume you propose.

B-11. Past Monitoring Results.

A complete list of ground water standards can be found in Section 20.6.2.3103 NMAC. The standards for contaminants most frequently monitored under Discharge Permits are as follows:

Nitrate-nitrogen (NO_3-N) ..... 10 mg/L
Chloride ..... 250 mg/L
Total dissolved solids (TDS) ... 1000 mg/L
Sulfate (SO_4) ..... 600 mg/L
pH ..... between 6 and 9

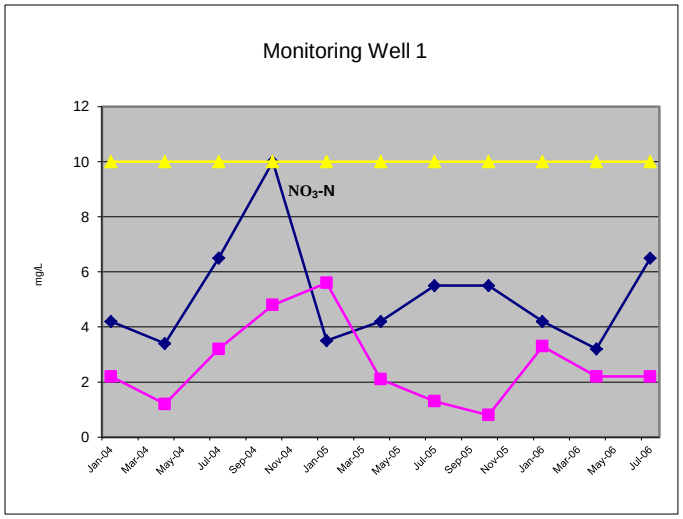
There is no ground water standard for total Kjeldahl nitrogen (TKN). Because TKN converts readily to nitrate as it moves through the vadose zone, however, concentrations approaching or exceeding 10 mg/L are of concern.

Additional parameters typically apply at mining or industrial facilities.

Some ground waters in the state have TDS or chloride concentrations that naturally exceed these standards. In that case, the standard is the naturally occurring level. You must provide documentation of such elevated natural conditions, such as analytical results from a non-impacted well.

An example table and graph follow:

Date	Monitoring Well 1	
	NO3-N	TKN
Jan-04	4.2	2.2
Apr-04	3.4	1.2
Jul-04	6.5	3.2
Oct-04	10	4.8
Jan-05	3.5	5.6
Apr-05	4.2	2.1
Jul-05	5.5	1.3
Oct-05	5.5	0.8
Jan-06	4.2	3.3
Apr-06	3.2	2.2
Jul-06	6.5	2.2



B-12. Discharge Volumes.

You must provide a method for measuring the discharge volume (Section 20.6.2.3109.H.1 NMAC). At facilities with treatment or storage lagoons, it is necessary to measure both the volume entering the treatment system as well as the volume ultimately discharged.

If you land apply wastewater to more that one discharge location, you must be able to track the volume to each location.

If your facility is small and relies on gravity to carry wastewater to the treatment and disposal system, it may be acceptable to estimate the wastewater flow. This can be done by metering water usage and deducting the volume of water used for fresh-water irrigation, swimming pools, evaporative cooling, livestock watering or other uses that do not result in wastewater flowing to the treatment system.

GROUND WATER DISCHARGE PERMIT APPLICATION
PART C: SITE INFORMATION
All Facilities

C-1. **Area Map.** Attach a current area map showing roads and clearly mark the location of your facility.
See Attached Figures C-1 through C-3.

C-2. **Directions to Site.** Provide driving directions to the site from the nearest town or, if located in a town, from an easily identifiable location.

From 5500 San Antonio Dr NE, Albuquerque, NM 87109 - Take I-25 S to exit 222A Gibson Blvd E and merge onto Gibson Blvd SE. Drive for about 3 miles and then turn right at Truman Street, SE. A visitor's pass or notification to the applicant will be required to enter Kirtland AFB. After going 0.6 miles on Truman Street, SE, turn left onto Randolph Ave SE. The Treatment Facility will be on the right.

C-3. **Topographic Map.** Attach a copy of the appropriate US Geological Survey topographic map. You may provide just the relevant portion. USGS maps are available at many outdoor equipment stores or bookstores, from the USGS at www.usgs.gov or 1-888-ASKUSGS, and from commercial websites.

On the map clearly indicate the location of your facility. Also identify the approximate locations of all wells within 1,000 feet of your discharge locations. The Office of the State Engineer has a searchable database of supply wells on its website at www.ose.state.nm.us.

X USGS map attached (Figure C-1) with facility location and neighboring wells marked.

C-4. **Flood Potential.** Attach a copy of the latest Federal Emergency Management Agency (FEMA) flood map with your facility's location clearly marked, to the best of your ability. Information about how to obtain this map, formally known as a Flood Insurance Rate Map (FIRM) is available at www.fema.gov, insurance agencies or county government offices. A site specific analysis may be substituted.

X FEMA map or site-specific analysis attached (Figure C-2).

☐ Previously submitted and still up-to-date. Submittal date(s): _____

C-5. **Soils.** Attach either:

a) A copy of the appropriate Natural Resource Conservation Service (NRCS) soil survey map, with your site clearly identified to the best of your ability. Include the descriptive information for soils associated with the discharge locations. To obtain the map, contact your local NRCS office – there is one in every county.

b) A site-specific assessment showing the soils classifications. This is preferred over the more generalized NRCS surveys.

X NRCS soil survey or site-specific assessment attached (Figure C-3).

☐ Previously submitted. Submittal date(s): _____

C-6. **Geology.** Provide information on the geology beneath the site by attaching relevant portions of geologic reports, well logs for on-site or nearby wells, or site specific assessments. A variety of geology publications and resources are available from the New Mexico Bureau of Geology and Mineral Resources at http://geoinfo.nmt.edu or 505-835-5420 (Socorro). Well logs are available from the New Mexico State Engineer's Office at http://www.ose.state.nm.us/.

☐ Geologic report attached.
☐ Well log(s) attached

X Geologic information previously submitted. Submittal date(s): 2011 through 2013

Geologic information has been submitted quarterly to the NMED HWB as part of the Quarterly Pre-Remedy Monitoring and Site Investigation Reports for the Bulk Fuels Facility Spill Solid Waste Management Units SS-111 and ST-106.

C-7. **Ground Water Hydrology.** Ground water hydrology refers to the occurrence, distribution, movement and chemistry of ground water. The ground water hydrology at your site will determine in large part whether your discharge will adversely affect ground water quality. You may need to present detailed information in order to "demonstrate that the Discharge Permit will not result in concentrations in excess of the standards of Section 20.6.2.3103 NMAC or the presence of any toxic pollutant." (20.2.3106.C.7 NMAC)

At a minimum, provide information below on the direction of ground water flow. Ground water may not flow in the same direction as water on the surface of the ground. A monitoring well survey is one of the best methods to determine the direction of ground water flow at a particular site. Such surveys are routinely required for many Discharge Permit locations.

If a survey is not available, check with well drillers, the city water department, staff at the Office of the State Engineer, environmental consultants or other knowledgeable persons in your area. In addition, relevant reports have been published for some areas. See the OSE website at www.ose.state.nm.us or the NMBGMR website at http://geoinfo.nmt.edu.

Direction of ground water flow: Northeast

If ground water flow shifts seasonally, describe here: _____

Reference:

☐ On-site well survey attached. **X** Previously submitted. Submittal date(s): 2011 through 2013

☐ Nearby well survey attached. ☐ Previously submitted. Submittal date(s): _____

☐ Other. Specify: _____

☐ Relevant portion attached

☐ Previously submitted. Submittal date(s): _____

Hydrologic information has been submitted quarterly to the NMED HWB as part of the Quarterly Pre-Remedy Monitoring and Site Investigation Reports for the Bulk Fuels Facility Spill, Solid Waste Management Units SS-111 and ST-106.

Attach any additional information available about ground water hydrology at the site.

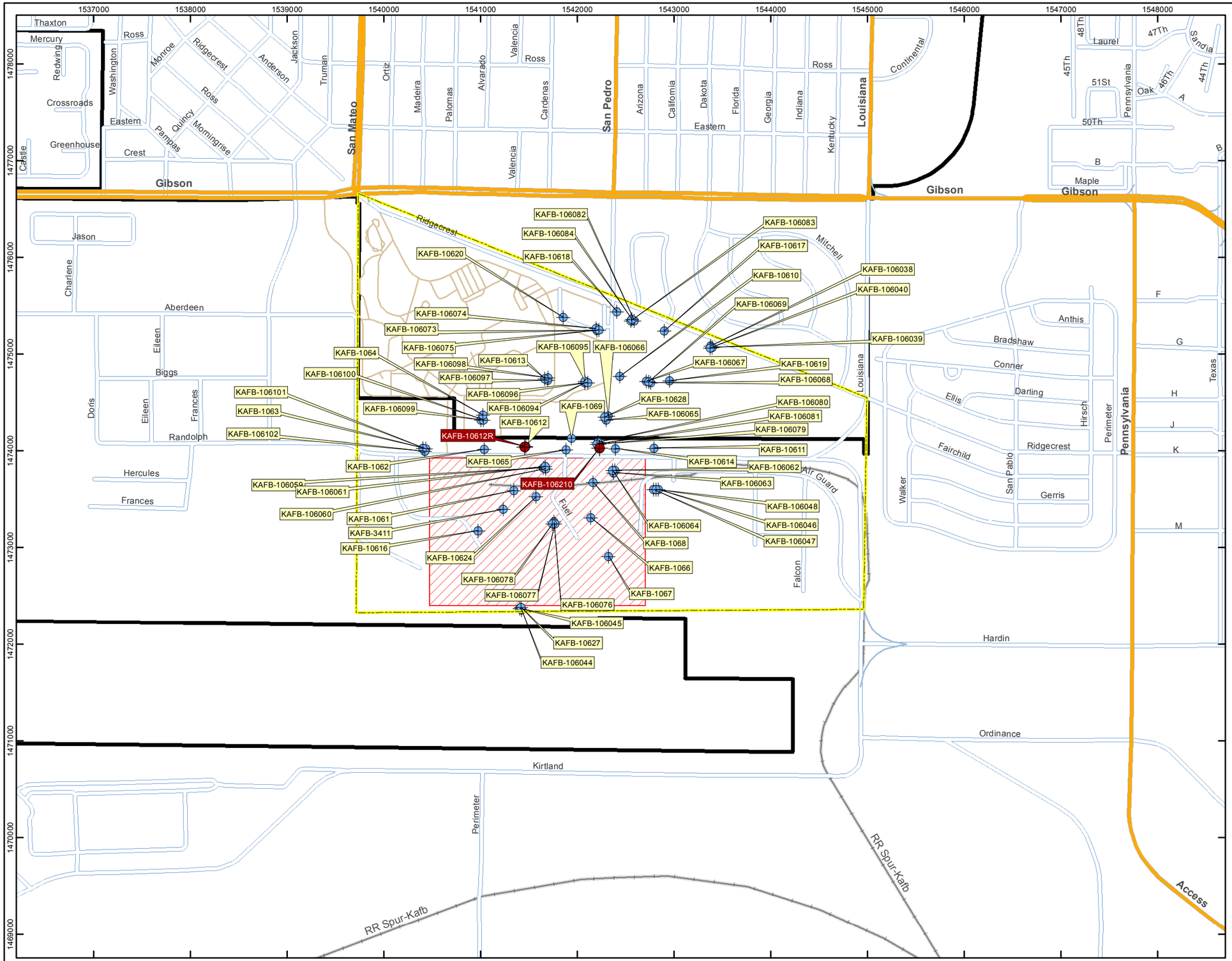
C-8. **Other Permitted Discharge Locations.** If applicable, list other locations of wastewater or stormwater discharges on your site that are not described in this application and indicate what permits apply to them. Examples include discharges from small septic systems (covered by Liquid Waste Permits, discharges to surface waters under a NPDES permit, a discharge covered by a separate Discharge Permit, etc. Be sure these other discharge locations are identified on the site map required in Item B-3.

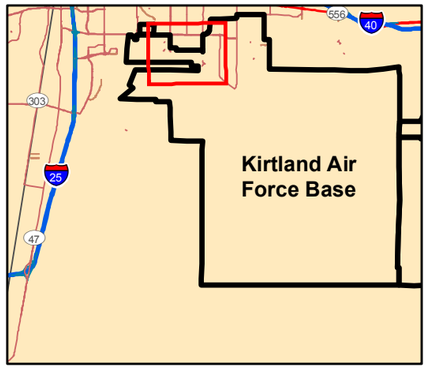
Discharge Type	Permit Identification
Not applicable.	Not applicable.

C-9. **Other Information.** Describe below or attach any additional information to demonstrate that your proposed discharge plan will be protective of ground water quality, public health and property.

Handling of waste and spill reporting will be in compliance with the Kirtland AFB RCRA Permit administered by the NMED HWB.

Figures





LEGEND

- Bulk Fuels Facility (Sites ST-106 and SS-111)
- Installation Boundary
- Area for Potential 20 Wells
- Potential Extraction or Reinjection Well
- Potential Extraction or Reinjection Well to be Installed in April, 2014

Source: USGS Digital Raster Graphics (Topographic Maps) [MSRMAPS.COM] 7.5 Minute Quadrangle, Albuquerque East 1:24000 updated: 1990

N

0 500 1,000 Feet

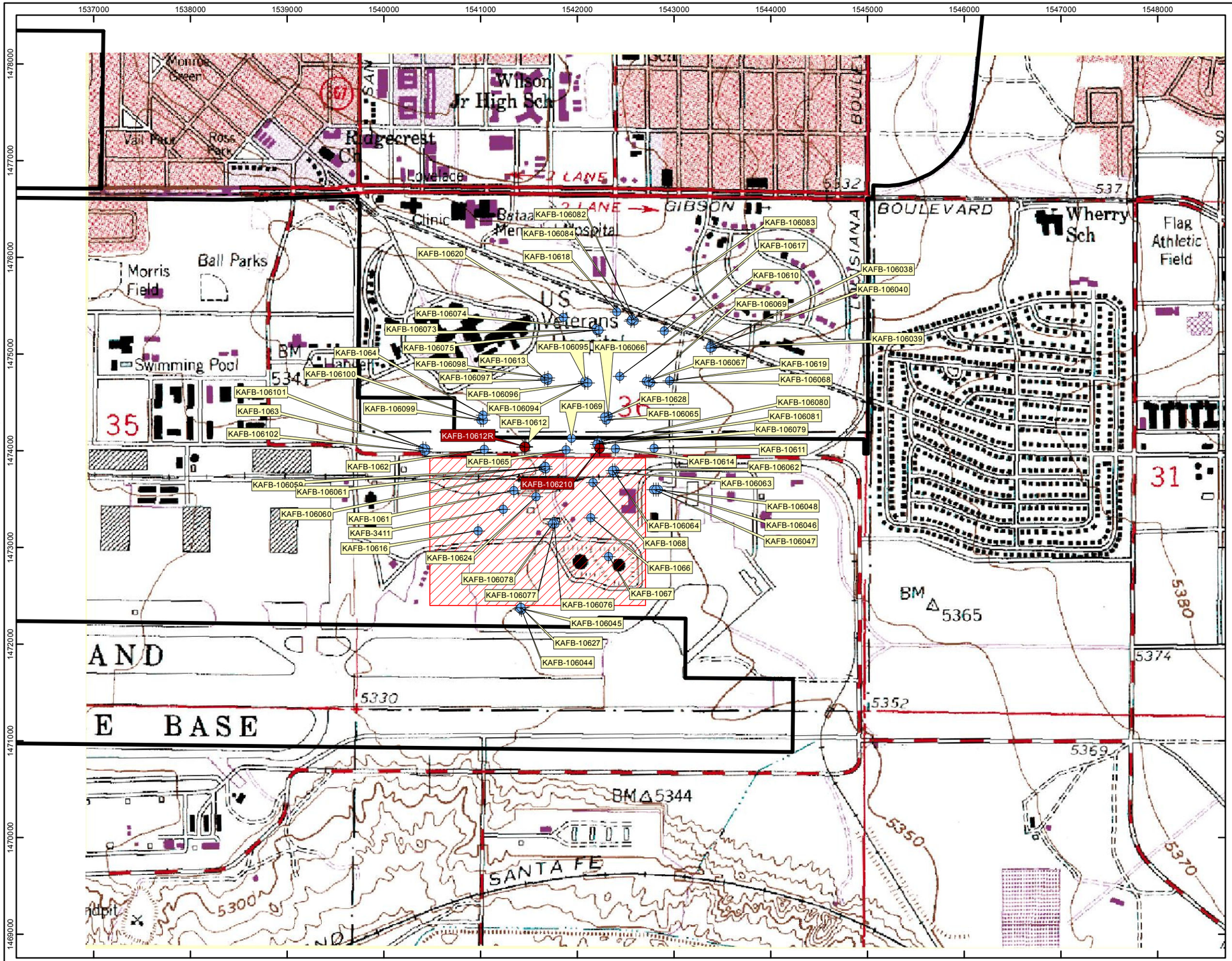
Projection : NAD_1983_StatePlane_New_Mexico_Central_FIPS_3002_Feet

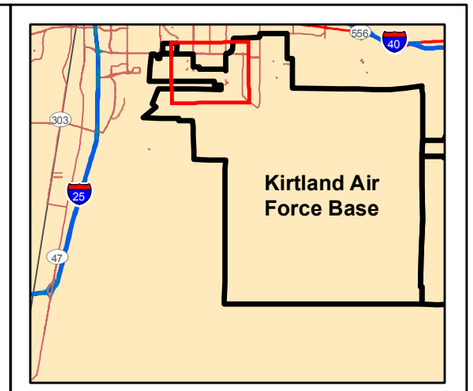
BULK FUELS FACILITY
KIRTLAND AIR FORCE BASE, NEW MEXICO

FIGURE A-1

TOPOGRAPHIC MAP
KIRTLAND BULK FUELS FACILITY
UIC DISCHARGE PERMIT

Project Number: 140705 Generated By: EJC Date: 04/23/14 File Path:H:\KAFB_BFF\GISDocuments\Project_Maps\2001AB_UIC_Discharge_Permit\Figures_new_Name\KAFB_013_UIC_Fig_A-1_20Wells.mxd





LEGEND

- Bulk Fuels Facility (Sites ST-106 and SS-111)
- Installation Boundary
- Elevation Contours (10 foot interval)
- Potential Extraction or Reinjection Well
- Potential Extraction or Reinjection Well to be Installed in April, 2014

Source: USGS Digital Raster Graphics (Topographic Maps) [MSRMAPS.COM] 7.5 Minute Quadrangle, Albuquerque East 1:24000 updated: 1990

N

0 500 1,000 Feet

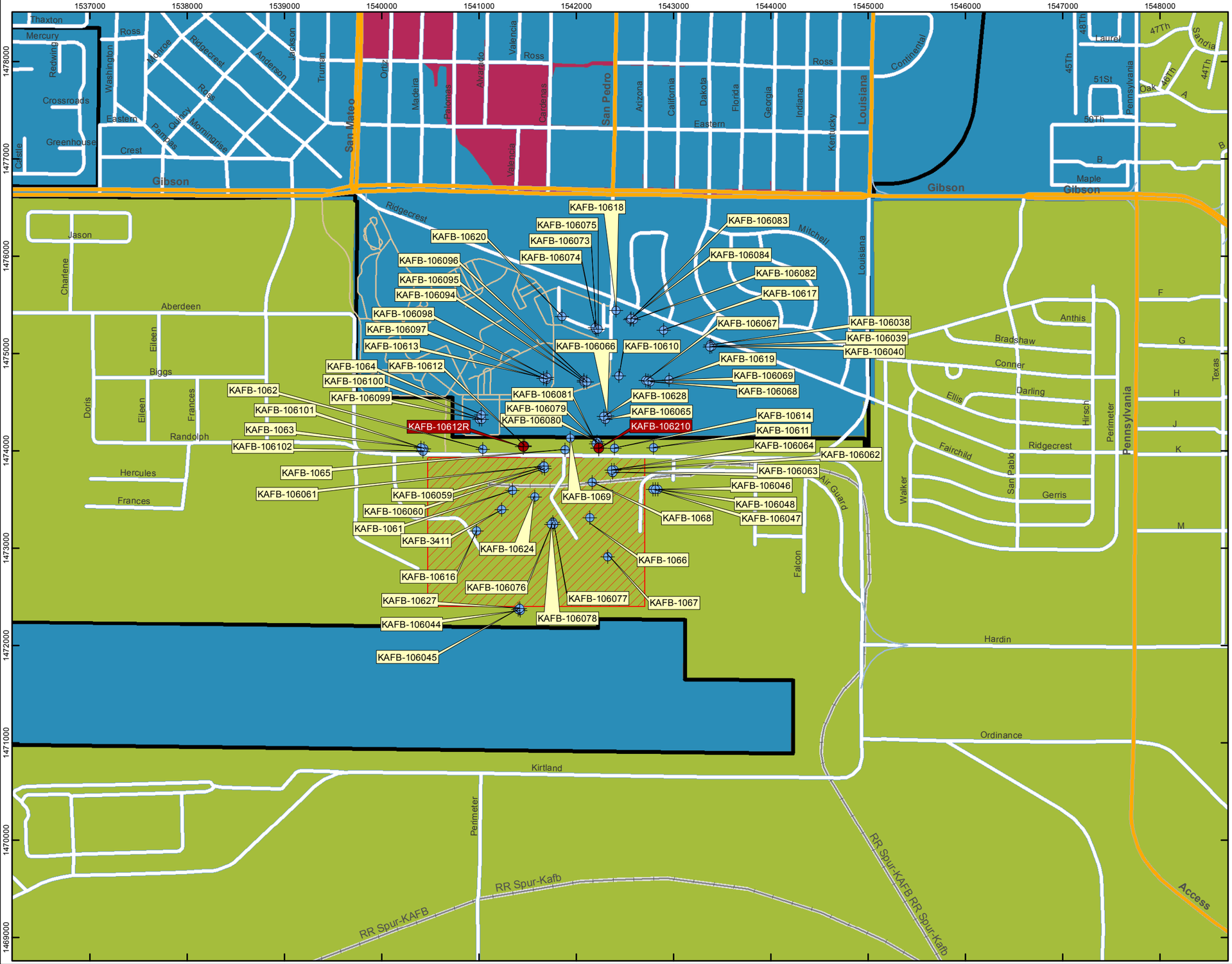
Projection : NAD_1983_StatePlane_New_Mexico_Central_FIPS_3002_Feet

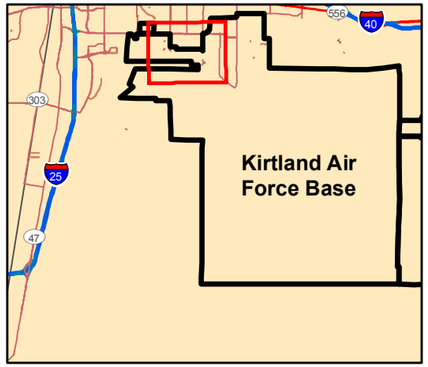
BULK FUELS FACILITY
KIRTLAND AIR FORCE BASE, NEW MEXICO

FIGURE C-1

TOPOGRAPHIC MAP
KIRTLAND BULK FUELS FACILITY
UIC DISCHARGE PERMIT

Project Number: 140705 Generated By: EJC Date: 04/15/14 File Path:H:\KAFB_BFF\GISDocuments\Project_Maps\2001AB_UIC_Discharge_Permit\Figures_new_Name\KAFB_002_UIC_Fig_C-1_Topo.mxd





LEGEND

- Bulk Fuels Facility (Sites ST-106 and SS-111)
- Installation Boundary
- Major Road
- Local Road
- Railroad
- Potential Extraction or Reinjection Well
- Potential Extraction or Reinjection Well to be Installed in April, 2014

FEMA FIRM Zones

- A
- D
- X

Definitions

FEMA = Federal Emergency Management Agency

FIRM = Flood Insurance Rate Map

A = Areas with a 1% annual chance of flooding and a 26% chance of flooding over the life of a 30-year mortgage. Because detailed analyses are not performed for such areas; no depths or base flood elevations are shown within these zones.

D = Areas with possible but undetermined flood hazards. No flood hazard analysis has been conducted. Flood insurance rates are commensurate with the uncertainty of the flood risk.

X = Area of moderate flood hazard, usually the area between the limits of the 100-year and 500-year floods.

Sources: www.rgis.unm.edu
www.fema.gov

N

0 500 1,000 Feet

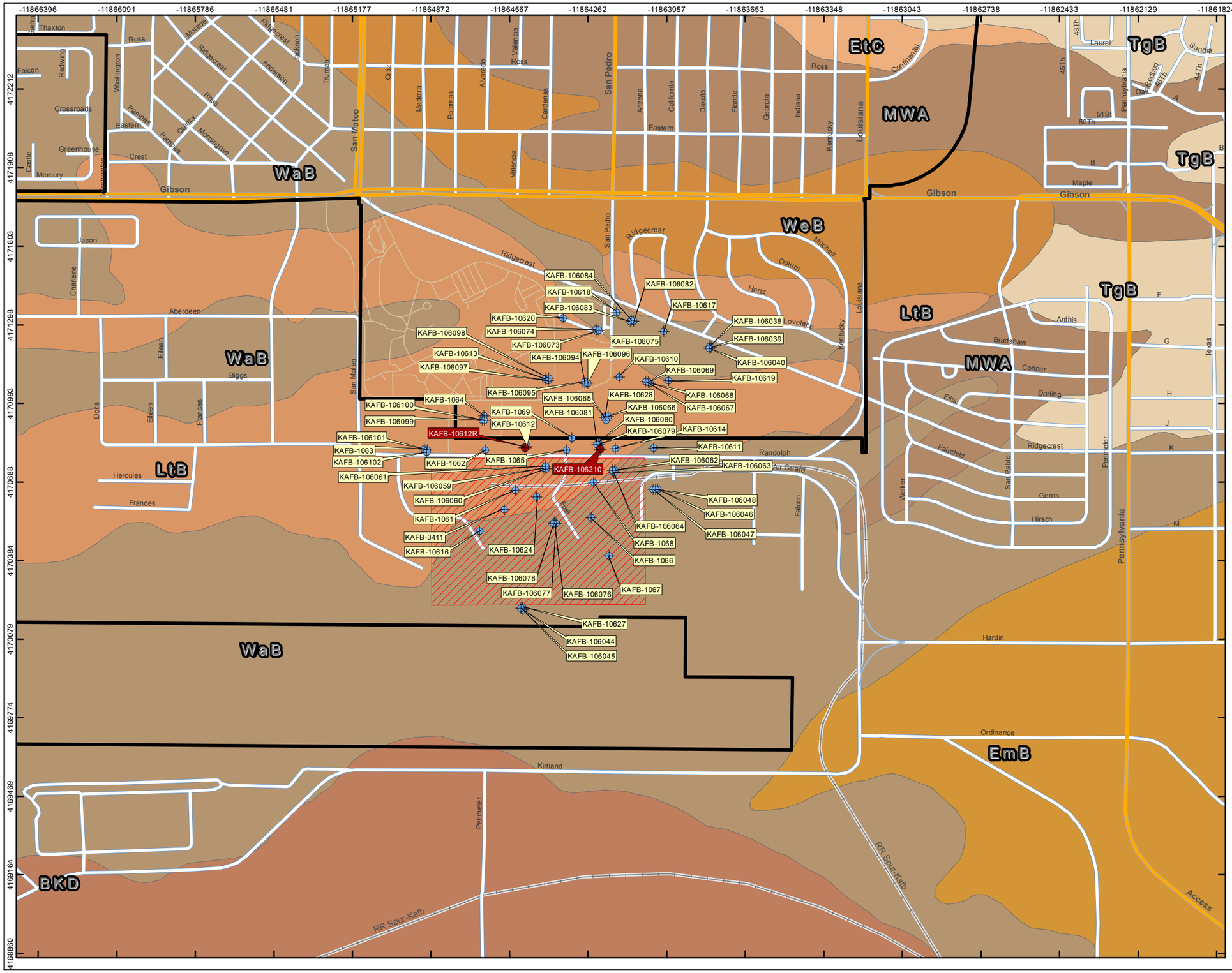
Projection : NAD_1983_StatePlane_New_Mexico_Central_FIPS_3002_Feet

BULK FUELS FACILITY
KIRTLAND AIR FORCE BASE, NEW MEXICO

FIGURE C-2

FLOOD POTENTIAL MAP
KIRTLAND BULK FUELS FACILITY
UIC DISCHARGE PERMIT

Project Number: 140705 Generated By: JDN Date: 04/15/14 File Path:H:\KAFB_BFF\GISDocuments\Project_Maps\2001AB_UIC_Discharge_Permit\Figures_new_Name\KAFB_003_UIC_Fig_C-2_Flood.mxd



BULK FUELS FACILITY
KIRTLAND AIR FORCE BASE, NEW MEXICO

FIGURE C-3

SOIL SURVEY MAP
KIRTLAND BULK FUELS FACILITY
UIC DISCHARGE PERMIT

Project Number: 140705 Generated By: JDN Date: 04/15/14 File Path:H:\KAFB_BFF\GISDocuments\Project_Maps\2001AB_UIC_Discharge_Permit\Figures_new_Name\KAFB_004_UIC_Fig_C-3_Soils.mxd

Attachments

Attachment A-10
Potential Amendments for Bench-Scale Testing and In Situ Bioremediation at KAFB SWMU SS-111*

1. Electron Acceptors/Sulfate sources
    a. Na_2SO_4
    b. $MgSO_4$
2. Electron Donor
    a. Sodium lactate
3. Iron sources (to precipitate iron as FeS)
    a. $FeCl_2$
    b. Ferrous ammonium sulfate
4. pH buffering agents
    a. $NaHCO_3$
    b. Na_2CO_3
5. pH adjustment agents
    a. HCl
    b. NaOH
6. Bioaugmentation
    a. SDC-9 (degrades EDB) 10^7/L GW
    b. ENVTCA-20 (degrades EDB) 10^7/L GW
    c. M. sphagni ENV482 (degrades EDB) 10^7/L GW
7. Nutrients
    a. Diammonium phosphate (DAP)
    b. Ferrous ammonium sulfate (3b) above
    c. Sodium lactate (2a above)
8. Nutrients to stimulate cometabolism
    a. Propane
    b. Ethane
9. Conservative Tracers
    a. NaBr
    b. LiCl

* This is an exhaustive list of possible amendments for bench-scale testing. Not all additives would be used simultaneously for in situ treatment.

Attachment A-11. Analytical Results from KAFB-106157

Well:	KAFB106157 (POST WELL DEVELOPMENT)		
Sample ID:	106157-D-1		
Sample Date:	9/30/2013		
Parameter	**Method**	**Sample Result (mg/L)**	**Permit Limit (mg/L)**
Flow		Totalizing flow meter	+/-10%
TRC	EPA330.5	0.1	NA
pH	SM4500HB	7.87	6 to 9
CBOD5	SM5210B	3.48	15
Total coliform (TC)	SM9223B	1	23 orgs/100ml
Total Dissolved Solids (TDS)	SM2540C	445	1000.0
Nitrate (NO3-N)	EPA300	<0.2	see total N
Total Kjeldahl Nitrogen (TKN)	EPA351.2	<1.5	see total N
Total Nitrogen (TKN + NO3-N)	Calculation	ND	10.0
Turbidity			5 NTU
Chloride (Cl^-)	EPA300	51.9	250.0
Fluoride (F^-)	EPA300	0.212	1.6
Sulfate ($SO4^{-2)}$	EPA300	66	600.0
Cyanide (CN)	EPA335.4	<0.01	0.2
Metals			
Aluminum	EPA200.8	0.3	5.0
Arsenic	EPA200.8	<0.01	0.1
Barium	EPA200.8	0.27	1.0
Boron	EPA200.8	0.061	0.75
Cadmium	EPA200.8	0.00029	0.01
Chromium	EPA200.8	<0.01	0.05
Cobalt	EPA200.8	0.0023	0.05
Copper	EPA200.8	0.0031	1.0
Iron	EPA200.8	1.1	1.0
Lead	EPA200.8	0.00065	0.05
Manganese	EPA200.8	1.3	0.2
Total Mercury	EPA245,1	<0.0002	0.002
Molybdenum	EPA200.8	0.007	1.0
Nickel	EPA200.8	0.024	0.2
Selenium	EPA200.8	<0.005	0.1
Silver	EPA200.8	<0.002	0.05
Uranium	EPA200.8	0.0026	0.03
Zinc	EPA200.8	0.23	10.0
Radioactivity			
Radium 226		NA	30 pC/L
Radium 228		NA	
Organics - Volatiles			
Benzene	SW8260B	0.0113	0.01
Carbon tetrachloride	SW8260B	<0.002	0.01
Chloroform	SW8260B	<0.002	0.10
1,1-Dichloroethane	SW8260B	<0.002	0.025

Well:	KAFB106157 (POST WELL DEVELOPMENT)		
Sample ID:	106157-D-1		
Sample Date:	9/30/2013		
Parameter	**Method**	**Sample Result (mg/L)**	**Permit Limit (mg/L)**
1,2-Dichloroethane	SW8260B	0.00254	0.01
1-1-Dichloroethylene	SW8260B	<0.002	0.005
Ethylbenzene	SW8260B	0.0504	0.75
Ethylene dibromide (EDB)	SW8011	0.000463	0.0001
Methylene chloride	SW8260B	0.00114	0.10
1,1,2,2-tetrachloroethane	SW8260B	<0.002	0.02
Tolulene	SW8260B	0.00118	0.75
1,1,1-Trichloroethane	SW8260B	<0.002	0.06
1,1,2-Trichloroethane	SW8260B	<0.002	0.01
Trichloroethylene	SW8260B	<0.002	0.005
Vinyl chloride	SW8260B	<0.001	0.001
Xylenes	SW8260B	<0.006	0.62
Organics - Semivolatiles			
Benzo(a)pyrene	SW8270D	<0.000192	0.0007
Napthalene + monomethylnaphthalenes	SW8270D	0.00819	0.03
Phenols	SW8270D	ND	0.005
Organics - Pesticides/PCBs			
Polychlorinated biphenyls	SW8082	<0.000463	0.001

Note
Metals data pending, dilution is needed.
Naphthalene and monomethylnaphthalenes include naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene
Phenol compounds consist of following

4-chloro-3-methylphenol	<0.00481	LOQ	
2-Chlorophenol	<0.00481	LOQ	
2,4-Dimethylphenol	<0.00481	DL	positive results down t
2,4-Dinitrophenol	<0.00801	DL	positive results down t
3-methylphenol/4-methylphenol	<0.00481	LOQ	
pentachlorophenol	<0.00481	DL	positive results down t
Phenol	<0.00481	LOQ	