KAFB Bulk Fuels Facility Spill

Status Report and LNAPL Containment Plan

Hazardous Waste Bureau
New Mexico Environment Department
http://www.nmenv.state.nm.us/hwb/

Public Meeting at Loma Linda Community Center
January 12, 2011

KAFB Bulk Fuels Facility

Fuel Storage and Distribution System

- Constructed ~ 1952.
- Tank farm (2.1 and 4.2 MGal tanks jet fuel).
- Ancillary piping (underground and above ground).
- Fuel Offloading Rack (recently removed).
- Fuels: aviation gas (in the past) and jet fuel (JP-4 prior to 1993, JP-8 since 1993).

Aerial Photograph of Bulk Fuels Facility

Former Fuel Offloading Rack

Underground Pipeline

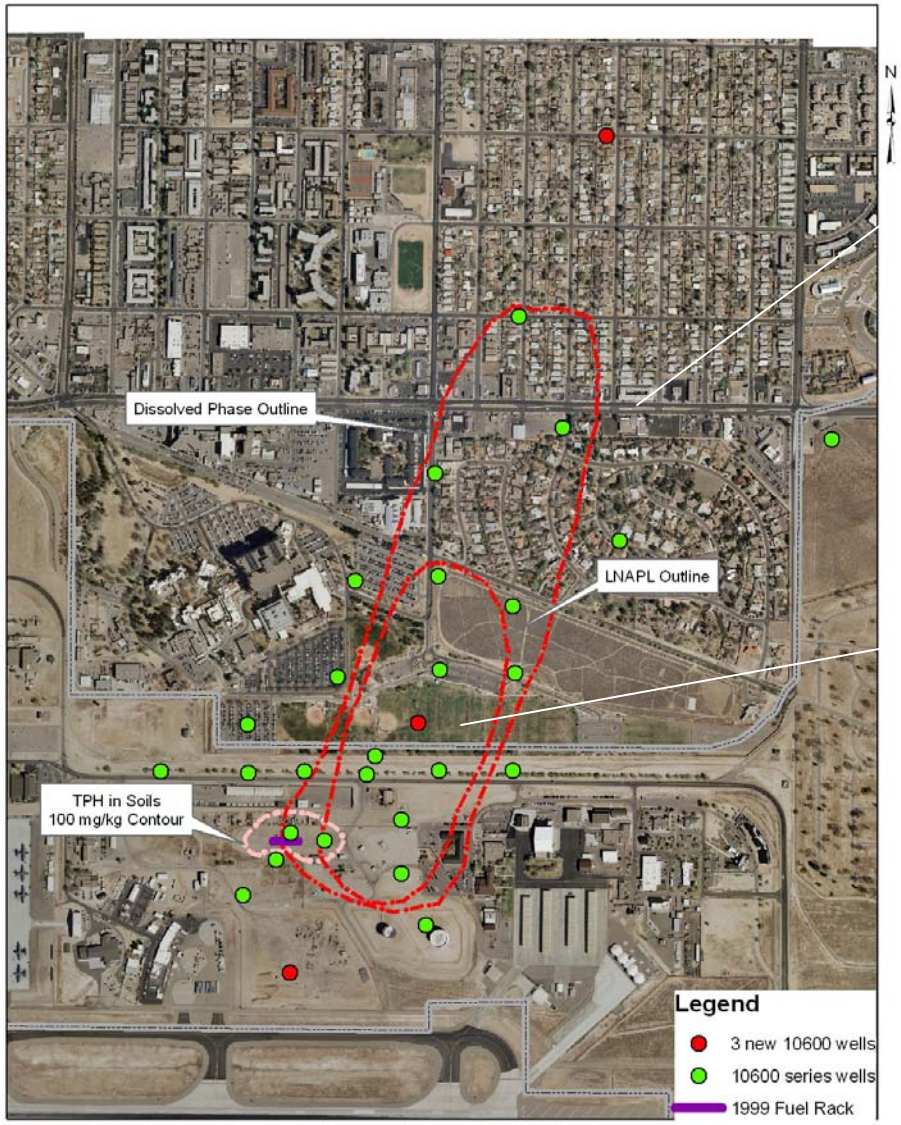
Above Ground Pipeline

Tanks

The Problem

- Millions of gallons of fuel have leaked into the vadose zone for possibly decades
- Jet fuel (LNAPL plume) floating on groundwater (depth 500 feet), extending north 0.5 mile.
- Dissolved fuel constituents form contaminated groundwater plume extending north 0.9 mile:
- Contamination has migrated, and may still be migrating, towards water-supply wells.

Known Horizontal Extent of Contaminant Plumes on/in Groundwater



Approximate Location of Groundwater Monitoring Wells

Gibson Blvd

Bullhead Park

Contaminant Plume Locations Relative to Water Supply Wells

Louisiana Blvd

Gibson Blvd

Major Objectives

- Accelerate characterization of vadose zone and groundwater
- Conduct Interim Measures to begin cleanup
- Conduct Corrective Measures Evaluation for selection of long-term remedy.

Three Work Plans

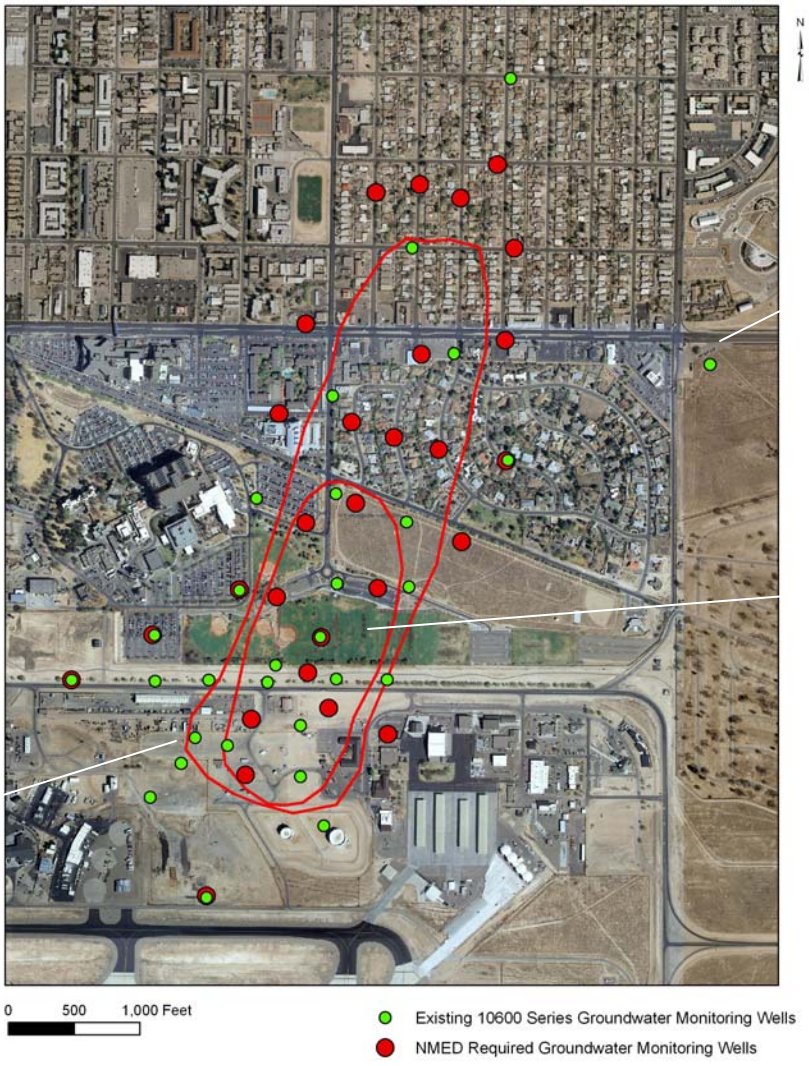
Revisions submitted November 4, 2010:

- **IM Plan –excavate former Fuel Offloading Rack area, complete shallow boreholes along ancillary piping, and conduct various tests.**
- **Vadose Zone Investigation Plan –complete soil borings and soil-vapor wells.**
- **Groundwater Investigation Plan – install groundwater monitoring wells**

Partial Approval of the 3 KAFB Work Plans

- December 10, 2010, NMED issued partial approval of the 3 Work Plans with direction to:
  - Install 78 additional groundwater wells
  - Install 35 additional soil-gas wells
  - Develop all groundwater wells
  - Conduct borehole geophysical logging, existing and new wells
  - Complete soil sampling at 27 deep borings
  - Complete soil sampling at former fuel offloading rack and along pipeline to tanks

Existing GW Wells and Locations for New GW Wells



Gibson Blvd

Bullhead Park

Former Fuel Offloading Rack

Needed Revisions to 3 Work Plans

- Revisions due March 31, 2011 for all 3 plans
- Revisions required for all 3 plans include:
  - Better define data gaps
  - Include site conceptual model based on currently available data
  - Various graphs, tables, maps and cross-sections need to be submitted
  - Quality Assurance Project Plan needs improvement

Needed Revisions to 3 Work Plans (continued)

- Revisions for Vadose Zone Investigation Plan include:
  - Increased sampling at former Fuel Offloading Rack.
  - Increased sampling along pipeline, with requirement to excavate soil contamination > SSLs.
- Revisions for Groundwater Investigation Plan include:
  - PVC casing/screens required for deep wells.
  - Propose method to assess hydraulic conductivity and aquifer porosity
- Revisions for Interim Measures Plan include:
  - Soil-Vapor Extraction Optimization Plan required.
  - Soil-vapor sampling and analysis plan needs detail

Summary of Groundwater Quality: Latest Data (July 2010)

- LNAPL plume size and position – no change based on current data
- Dissolved-phase plume – no change in plume size and position of contaminants > water quality standard. Toluene detected in northern-most well at 17.4 µg/L.
- As previously known, dissolved concentrations of benzene, toluene, xylene, and EDB are low outside of LNAPL plume (but above water quality standards in places).
- Based on July sampling event (from wells not properly developed?), dissolved concentrations of benzene, toluene, xylene, and EDB are up to 4 orders of magnitude higher immediately beneath the LNAPL plume

Status of Work Completed Under the 3 KAFB Work Plans

From December 16, 2010, to January 7, 2011:

- Deep groundwater monitoring well at cluster location #6 installed; drilling for intermediate well at 500 ft.
- Drilling of soil-vapor well at location #5 at 220 ft.
- Geophysical logging completed for the 29 existing wells

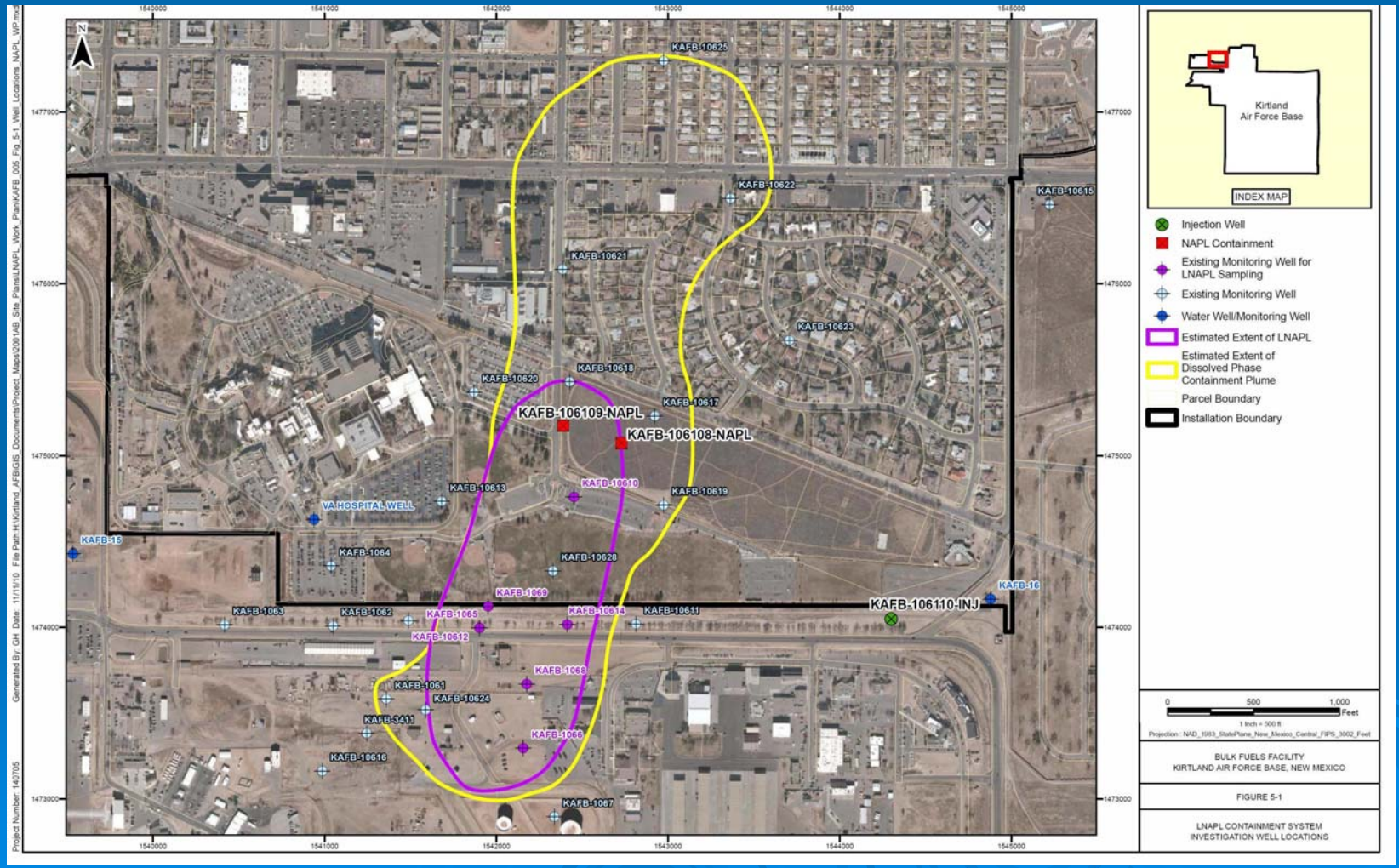
Vapor-Intrusion Study

- Vapor intrusion must be investigated to protect workers at Bulk Fuels Facility.
- KAFB has prepared a report on vapor-intrusion.
- NMED is reviewing the report and anticipates issuing findings soon.

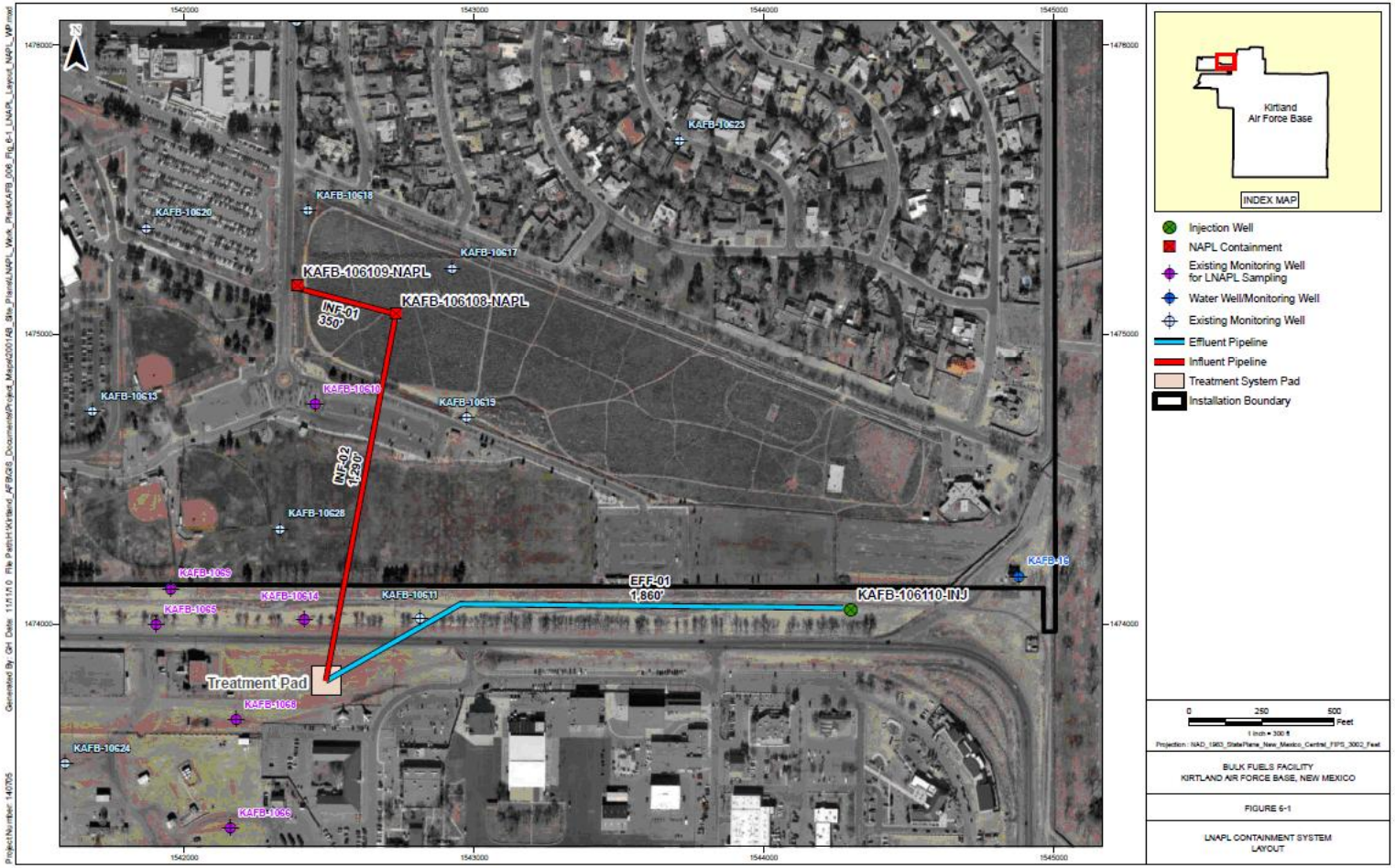
KAFB's LNAPL Containment Plan

- A plan to obtain characterization data for preparing a plan to conduct an interim measure.
- Conceptually, KAFB proposes to stop migration of LNAPL and dissolved-phase plumes by extracting groundwater at leading edge of LNAPL plume, treating the water, and re-injecting the water back into the aquifer
- Does not provide for removing the bulk of LNAPL

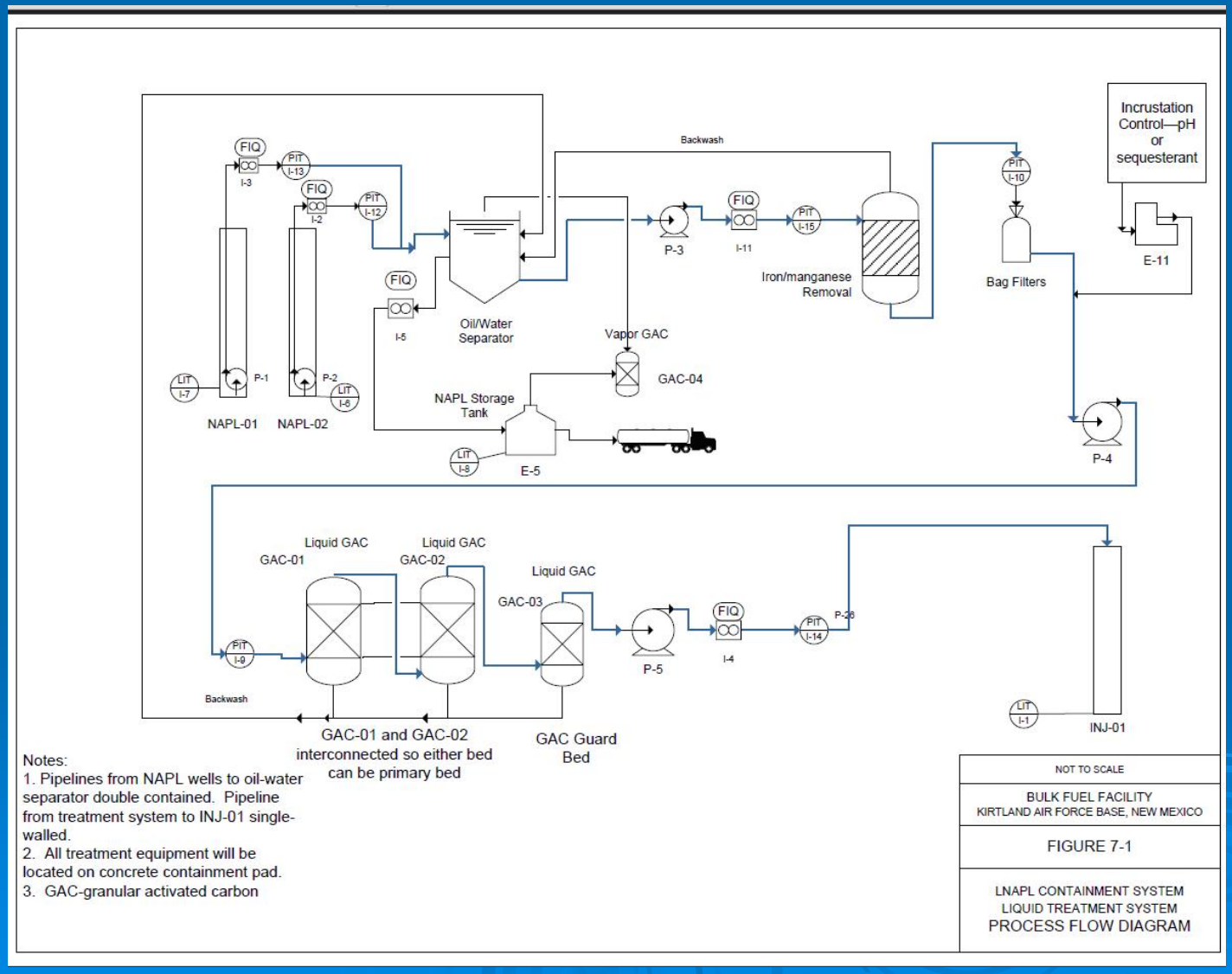
LNAPL Containment Plan
Locations of Extraction Wells Relative to Contaminant Plumes



LNAPL Containment Plan
Locations of Extraction Wells, Piping, Treatment Unit, and Injection Well



LNAPL Containment Plan
Conceptual Process Flow Diagram



LNAPL Containment Plan

Available on NMED's web site:

http://www.nmenv.state.nm.us/hwb/kafbperm.htm#KAFBBulkFuelsFacSpill

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