

Former Lowry AFB Titan I Missile Site 1 Complexes 1B & 1C Update

Omaha District

Environmental Remediation Branch

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US Army Corps of Engineers
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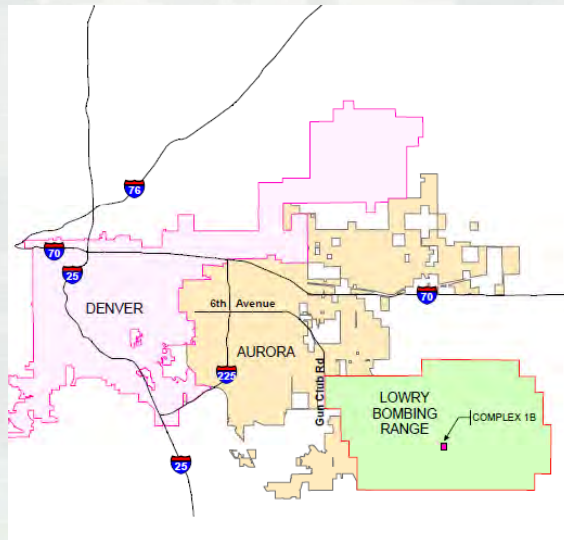
Overview

- Lowry Complex 1B Site Location
- Former Lowry AFB Titan I, Complex 1B
 - Remedy In-Place
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 - Project Milestones

- Lowry Complex 1C Site Location
- Former Lowry AFB Titan I, Complex 1C
 - Feasibility Study



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Site Location Map
Titan I Missile Site 1, Complex 1B



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Former Lowry AFB Titan I Complex 1B Remedy In-Place Execution

- The Contractor (Tidewater, Inc.) will perform all work necessary to attain **Remedy in-Place (RIP)**. The work requires remediation of ground water at the Formerly Used Defense Sites associated with the Former Lowry AFB Titan I, Missile Site 1 Complex 1B. The contract is a firm fixed price performance-based contract.
- Work to be performed includes conceptual site model verification, preparation of proposed plan, a decision document, and remedial design documents, a response action to include remedy in-place, and a minimum of one (1) year of operation and maintenance (O&M).
- The Remedy In-Place will target treatment of the source area and the start of a long-term groundwater monitoring system, so it can effectively reduce the toxicity, mobility, and volume of impacted groundwater and plume migration.
- Tetrachloroethene (PCE) and Trichloroethene (TCE) in ground water are the only identified contaminants of concern (COCs). During the most recent sampling event, PCE and TCE exceeded their respective Colorado Basic Standards for Ground Water (CBSGs).



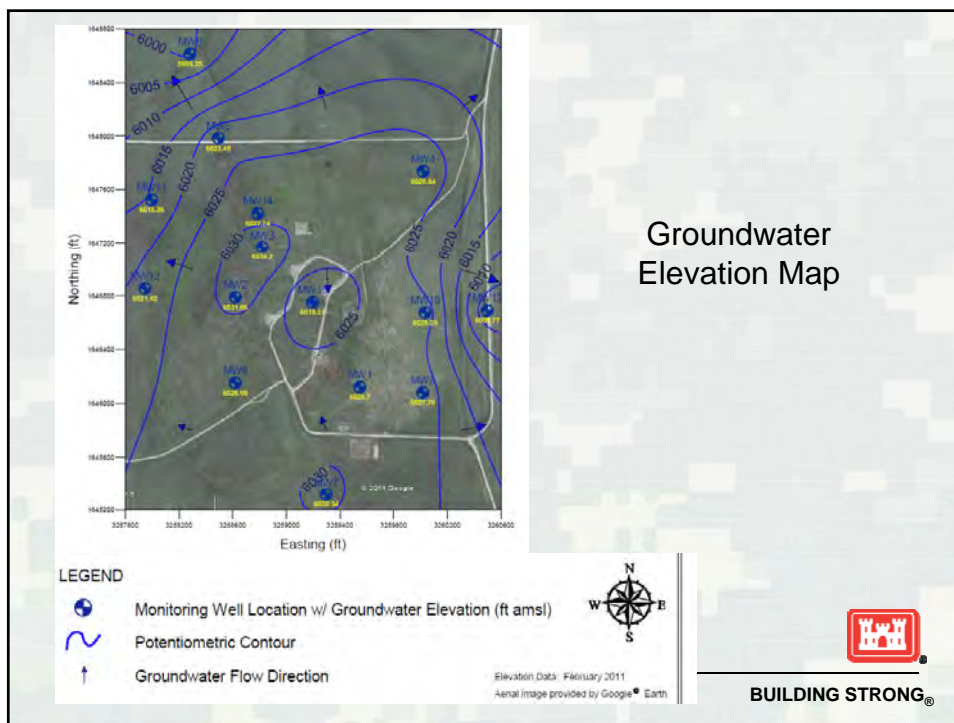
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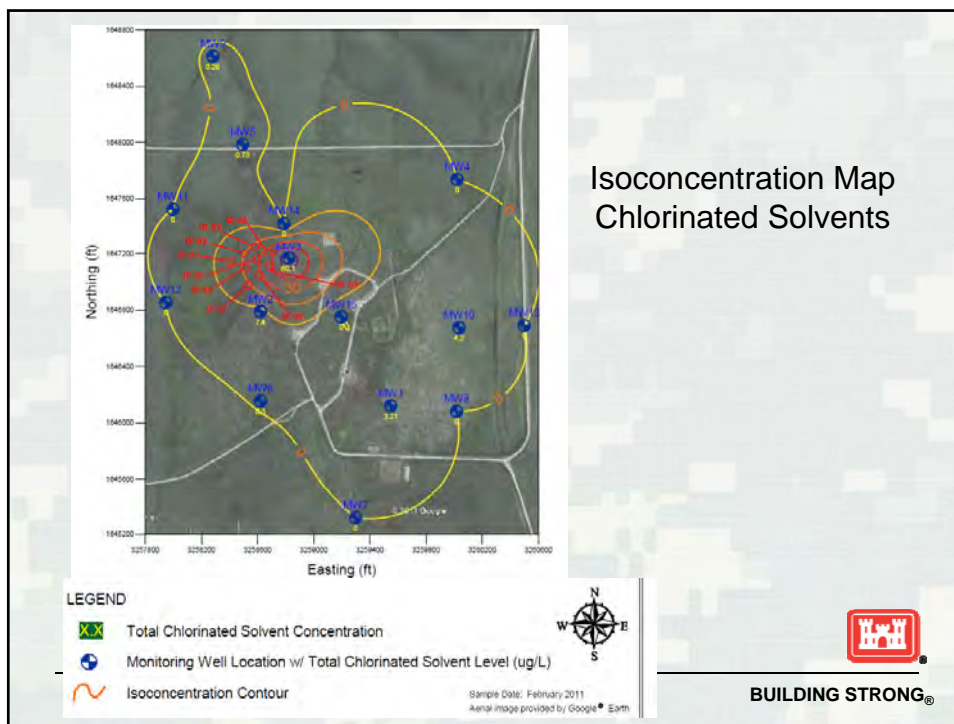
Former Lowry AFB Titan I Complex 1B Pilot Test Study

- The performance of a Pre-Design Investigation and an In-situ Chemical Oxidation (ISCO) Pilot Test will assist the contractor in updating the existing Conceptual Site Model (CSM) and to implement injection of potassium permanganate ($KMnO_4$) to mitigate elevated levels of contaminants of concern (COCs) prior to remedial activities.
- The field activities include installation of two additional groundwater monitoring wells, one round of groundwater monitoring from the entire monitoring well network, and collection of three (3) saturated soil samples for determining soil oxidant demand(SOD).
- The Pilot Test will be considered successful if reductions in COC concentrations in the monitoring wells are 30 to 50 percent per injection event where elevated levels of COCs were detected.
 - Two (2) injection events are scheduled during the Pilot Study
 - In addition, observance of permanganate in the permanent monitoring wells and the temporary ISCO injection wells will be another indicator of success.



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Former Lowry AFB Titan I Complex 1B 1,4-Dioxane

Well	Total Chlorinated Solvent (PCE and TCE)	1,4-dioxane
MW3	60.1	ND
MW4	ND	ND
MW-14	ND	ND
MW-15	ND	ND

ND = non detect (not found to levels equal to the method detection limit)

Method 8260B was used for PCE/TCE with DL= 0.25 µg/L.
Method 8260B SIM was used for 1,4-dioxane with DL=0.75 µg/L.

If 1,4-dioxane was present on site: MW3 had the highest probability of detection, MW4 was down gradient and would be indicative of levels near site boundary, and MW14 and MW15 were new wells thought to be in area of greatest influence.



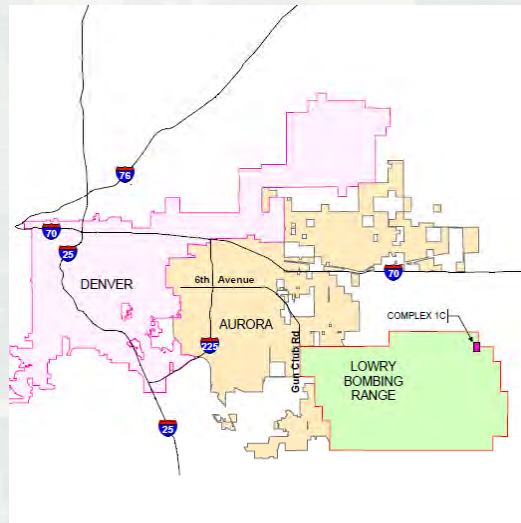
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Former Lowry AFB Titan I Complex 1B Project Milestones

<u>Milestone Task</u>	<u>Completion Date</u>
Work Plan (UFP-QAPP, CQC , IDW and Public Relation)	December 2010
Site Characterization Field Work	February 2011
Pilot Study (Injection)	May 2011
Pilot Study (Sampling Round)	July 2011
Pre-Design Investigation Report	November 2011
Proposed Plan	February 2012
Public Comment Period	March 2012
Decision Document	July 2012
Remedial Design/Remedial Action Work Plan	February 2013
Response Action	April 2013
Remedy In-Place and O&M Plan - Accepted	August 2013
Operation and Maintenance Sampling Complete	March 2014
Interim Site Remediation Report - Accepted	June 2014



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Site Location Map
Titan I Missile Site 1, Complex 1C



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Former Lowry AFB Titan I Complex 1C Feasibility Study

- The Feasibility Study (FS) will evaluate the potential actions for remediation of contaminants identified in the groundwater and shallow surface soils at the Former Lowry AFB Titan I Missile Site 1, Complex 1C.
- Contaminates of Concern (COCs) are tetrachloroethylene (PCE) and trichloroethylene (TCE) in groundwater and polynuclear aromatic hydrocarbons (PAHs) and polychlorinated biphenyls (PCBs) in soil.
- The FS will include the development and screening of alternatives and the detailed analysis of alternatives:
 - Identifying remedial action objectives,
 - Identifying potential treatment, resource recovery, and containment technologies that shall satisfy these objectives,
 - Screening the technologies based on their effectiveness, implementation, and cost, and
 - Assembling technologies and their associated containment or disposal requirements into alternatives for the contaminated media at the site.



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Former Lowry AFB Titan I Complex 1C Feasibility Study

- Vapor intrusion modeling will also be considered as an additional step in determining the impact of volatile organic compounds (VOCs) in groundwater to indoor air quality.
- Groundwater modeling will be used to aid in the determination of extraction well and/or circulation cell layouts, estimate pumping and circulation rates, and provide time estimates for groundwater pore volume removals.



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Former Lowry AFB Titan I Complex 1C Feasibility Study - Schedule

<u>Task</u>	<u>Completion Date</u>
Draft Report	May 2011
Draft Final Report	July 2011
Final Report	September 2011



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