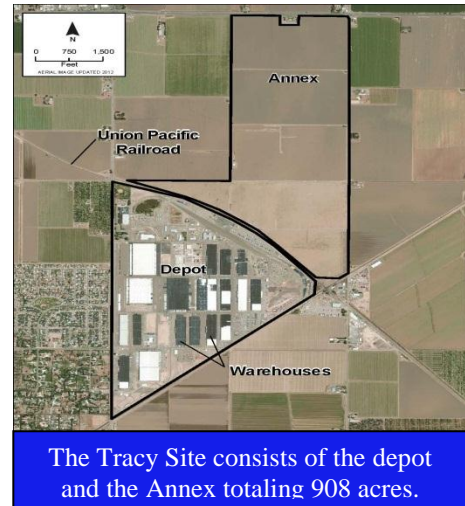


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DLA Tracy Site, Path to Construction Complete Status

Introduction

The Tracy Site is an active distribution depot operated by the Defense Logistics Agency (DLA) to supply military services with the equipment needed to fulfill their missions. The combined civilian and military population approximates 1,200 persons. Located in California's San Joaquin Valley, the Tracy Site sits approximately 1.5 miles southeast of the City of Tracy community incorporated in 1910. The area surrounding the City of Tracy is used primarily for agriculture. Several unincorporated communities surround the Tracy Site in addition to large urban communities. These include the City of Stockton, approximately 15 miles to the northeast, and the City of Modesto, approximately 25 miles southeast of the depot.



The operating portion of the site covers a 448-acre triangular parcel. The Annex, purchased in 1993, consists of 460 acres of agricultural land north of the depot. A Union Pacific railroad track parallels the northern boundary of the depot and separates the depot from the annex. About 75 percent of the depot is covered with buildings (primarily warehouses), asphalt, or concrete.

Background

In 1942, the Tracy Site originated as a “sub depot” of the United States Army’s Quartermaster Corps, Oakland Army Depot. In 1963, operational control of the site was transferred to DLA, though the Army retains ownership of the property. The Tracy Site became known as Defense Distribution Depot San Joaquin – Tracy Site. The site’s current name is DLA Distribution San Joaquin, California.

Current supply activities at the Tracy Site include storage, handling, preservation, packaging, and shipment of food, medical, construction, clothing; electronic, industrial, and general supplies to military services within the western United States and throughout the Pacific Rim region.

Past depot mission activities that resulted in environmental contamination included vehicle maintenance, material stockpiling, drum storage, waste disposal, and wastewater management. Releases of chemicals and hydrocarbon fuels have contaminated soils and groundwater with degreasing solvents, heavy metals, pesticides, and petroleum-based oils and lubricants.

Environmental studies have been on-going at the Tracy Site since 1980 when soil and groundwater contamination were first detected at 25 solid waste management units (SWMUs). An initial remedial investigation (RI) conducted between 1986 and 1992 led to the Tracy Site being listed on the Comprehensive Environmental Response, Compensation, and Liability Act’s (CERCLA’s) National Priorities List (NPL) as a Superfund site in 1990. In 1991, DLA, the United States Protection Agency (U.S. EPA), California Department of Toxic Substances Control (DTSC), and California Regional Water Quality Control Board (RWQCB) signed a Federal Facility Agreement (FFA) for the Tracy Site. The regulatory agencies provide oversight consisting of technical support and review of all investigative and cleanup activities.

Restoration challenges at the Tracy Site are the sum of multiple factors:

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1. There are three primary contaminant classes (volatile organic compounds (VOCs), pesticides, and petroleum hydrocarbons) present in three different media (soil, soil gas, and groundwater). Each contaminant class and each contaminated media require a different remedial technology.
2. Regulatory compliance is administered by the federal government (U.S. EPA) and by two State of California agencies (i.e., RWQCB and the DTSC) requiring compliance with both State and Federal regulatory criteria, which have become increasingly stringent over the last 33 years.
3. While the contamination originated on-site, groundwater contamination migrated off-site. Off-site contamination required the purchase of the annex property to assure that the land would not be developed and residential water users could not be affected by the contaminated groundwater. DLA also engages with private property owners for access to those off-site contaminated areas that were not purchased.

Community involvement programs consist of periodic newspaper and mailed notices to adjacent residents with information on the remedial program status. In addition, the Installation Restoration Program (IRP) team coordinates with the Tracy Public Library to facilitate public review of key documents, and an Administrative Record of all IRP documents is maintained at the Tracy Site. Community meetings are held on an as-needed basis.

Document	Description
July 2011 <i>Record of Decision, Remedy for the Northwestern Corner Groundwater Operable Unit.</i>	- The NWC OU ROD instituted the groundwater remedy for dieltrin impacted groundwater in the NWC.
September 2011 <i>2011 Explanation of Significant Differences to the 1998 Record of Decision.</i>	- Modified the remedy for SWMU 20 from land use control only to the addition of enhanced SVE. Clarified the basis for SVE system shutdown.
January 2012 <i>Area 1/Building 237 Engineering Evaluation/Cost Estimate .</i>	- Presented an evaluation and recommendation of removal action alternatives to address pesticide-impacted soils.
May 2012 <i>Area 1/Building 237 Action Memorandum/Removal Action Work Plan .</i>	- Presented the rationale for a non-time critical removal action. - Described the actions necessary to complete the chosen alternative.

Environmental restoration agreements for the Tracy Site are presented in Table 1.

Accomplishment Summary for FY2011 – FY2012 (1 Oct 2010 – 30 Sept 2012)

Accelerated Environmental Cleanup

In late 2010, the U.S. EPA placed the Tracy Site on a listing to achieve Construction Complete within 2 years. Because of the need for design and construction of three additional remedial actions and preparation of two additional decision documents, achieving Construction Complete within 2 years seemed impossible at the time. DLA rose to the challenge; scrutinizing the program and developing an aggressive schedule that would achieve the Construction Complete Milestone by 2012.

To accomplish this goal, the formal document review schedule for every upcoming technical document was shortened from 60 days to 30 days. This accelerated schedule resulted in expedited remedial design reviews at three sites, allowing remedy implementation in an expeditious manner, ultimately achieving the Construction Complete Milestone within two years rather than the four years originally scheduled. The restoration team worked well together, as well as with regulators and the local community. This led to the completion of the final remedial actions in September 2012, and thus, the successful completion of the Construction Complete goal. DLA's IRP team also recommended and implemented remedial action enhancements that

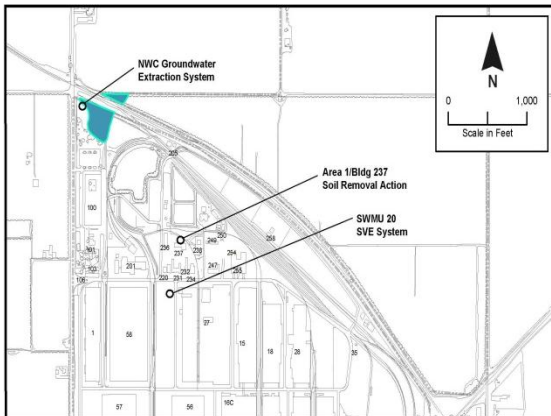
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resulted in a cost avoidance of more than \$20 million and 27 years of treatment system operations and monitoring.

The bullets below demonstrate the achievement of the expedited schedule, resulting in the significant accomplishment of attaining Construction Complete. Achievement of this milestone is an important step in removing the site from the NPL.

- In July 2011, the Northwestern Corner (NWC) Record of Decision (ROD) was finalized. This allowed design and construction of the groundwater remedy to proceed.



In the last 3 years, the final 3 remedial actions for Construction Complete were implemented.

- Within six months (January 2012), the NWC groundwater remedy construction was completed and the system was started.
- In September 2011, an Explanation of Significant Difference (ESD) was finalized to revise soil gas cleanup standards and allow construction to proceed on SWMU 20's soil vapor extraction (SVE) system.
- Within one month of ESD finalization (October 2011), the SWMU 20's SVE system construction was completed and operation was started.
- In June 2012, the Area 1/Building 237 Action Memorandum was finalized to allow the soil remedy implementation to proceed.

- Within two months (August 2012), the Area 1/Building 237 soil remedy was completed.
- In September 2012, the Tracy Site achieved Construction Complete status. Because of DLA's focus on an aggressive schedule, implementation of the ROD-specified remedies was accomplished within 2 years.

In addition to achievement of the Construction Complete goal, the Tracy IRP Team made the following significant accomplishments:

- In August 2012, SWMU 20's SVE system achieved the ROD-specified clean-up goals for groundwater protection. Achieving soil clean-up goals is a key factor in removal from the NPL.
- In August 2012, the second Five Year Review was finalized.
- In September 2012, 50 percent of the groundwater extraction wells were able to be shut-down because the ROD-specified clean-up goals were achieved. Attainment of groundwater clean-up goals is a key factor in removal from the NPL.

Innovative Technology Demonstration/Validation and Implementation

Because achievement of Construction Complete required an assurance that the planned remedies would be successful long term, DLA's IRP team evaluated several innovative technologies in various areas to ensure remedy implementation would achieve remedial action objectives. One innovative technology example is the pneumatic fracturing of vadose zone soils that was performed at the SWMU 20 site to increase the permeability of the clayey soils and enhance the air flow and communication of the SVE well network. Pneumatic fracturing employs injecting high pressure gas into the subsurface creating a "spider-web" of cracks throughout the subsurface. The vacuum induced by the SVE system can then extract the contaminated soil

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vapor through the subsurface the cracks. This resulted in the removal of 170 percent more mass than estimated in the Feasibility Study, and attainment of clean-up goals after only 10 months of operation. This was a reduction of 14 months from the estimated time of operation.

Partnerships Addressing Environmental Restoration Issues Between DoD and Other Entities

DLA's ability to work well with its contractors, the regulators and the local community resulted in completion of the final remedial actions within two years of the adoption of the accelerated schedule, resulting in the achievement of the Construction Complete goal. This accomplishment required significant communications and coordination as well as a concerted effort towards effective relationships. DLA's plan, which proved successful in facilitating reviews and effective communication, consisted of the following:

- **Frequent Communications** - To keep the regulatory agencies (U.S. EPA, RWQCB, and the DTSC) apprised of the status of the environmental program, DLA held monthly teleconference calls to discuss schedule, and quarterly meetings to address both schedule and technical issues. The frequency of the meetings allowed DLA to maintain an accelerated schedule and attain the Construction Complete Milestone on-time. Every single document necessary for the Construction Complete was given utmost importance and was not allowed to reside in the approval queue for more than 60 days prior to being issued final.
- **NWC Remedial Partnering Forum** - During the course of implementing the ROD-specified remedies, the California RWQCB recommended enforcing a drinking water action level for dieldrin in an isolated NWC groundwater plume. Dieldrin does not have a promulgated drinking water maximum contaminant level for protecting public health, and the dieldrin plume was considered immobile with a total estimated mass of only 6 grams; therefore, DLA selected monitoring as the remedy to meet human health protectiveness standards. RWQCB, citing groundwater protectiveness regulations, suggested an active remedy (e.g., groundwater extraction) to remediate the groundwater plume. In an effort to limit DLA's risk and ultimately its costs, a formal partnering forum was invoked in an attempt to reach a negotiated agreement with the three regulatory agencies (RWQCB, DTSC, and the U.S. EPA).
- The partnering allowed senior managers from each stakeholder group to engage and identify key issues. Ultimately, the agreed upon remedy was based on a limited number of groundwater extraction wells operating for a designated amount of time to make a best and final effort to mitigate the groundwater contamination. While the agreement did not specify minimum groundwater extraction flow rates or mass removal requirements, DLA was obligated to install the most effective system and to continuously optimize the groundwater extraction system for maximum efficiency during the operational period. The agreed upon remedy quantified DLA's risk (limited number of wells operating for a limited period of time) and was not based upon a potentially unachievable drinking water quality action level. The implementation of the agreed upon remedy saved DLA approximately \$20 million dollars and 27 years of groundwater remediation activities.

Reducing Risk to Human Health and the Environment

The accelerated schedule allowed for the rapid design, construction and implementation of three remedies as well as finalization of the second Five Year Review. In FY 2012, two of the three remedies achieved the specified clean-up goals, which were designed for the ultimate protection of human health and the environment.

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- **Area 1/Building 237 Soil Removal Action** - The presence of pesticides in soil presented elevated cancer and non-cancer risks. In 2012, DLA excavated the contaminated soils to reduce both cancer and non-cancer risk to acceptable levels.
- **SWMU 20 SVE System** –High concentrations of VOCs in soil gas contributed to both groundwater contamination and to a vapor intrusion hazard at the SWMU 20 site. In October 2011, construction of the SWMU 20 SVE system was completed and the system was started. Ten months later the clean-up goals were met and the vadose zone is no longer considered a source of groundwater contamination.

Green Remediation

DLA actively sought opportunities in each remedy to utilize green technologies. Examples include:

- **NWC Groundwater Remedy** - In November 2011, the DLA incorporated green remediation techniques to the groundwater extraction remedy by reusing two 1,000-lb carbon vessels existing in on-site inventory. DLA also utilized over 1,000 feet of 6-inch diameter high density polyethylene piping for extracted water conveyance. The piping was left-over from a pilot study performed years prior. In addition, implementation of this agreed upon remedy reduced the estimated time of pump and treat operations from 30 years to 3 years, a savings of 27 years of active remedial operations.
- **Site-Wide Groundwater Remedy Optimization** – In September 2012, 50 percent of the groundwater extraction wells were shut-down because the ROD-specified clean-up goals were achieved. Curtailing the active extraction network reduced the pumped and treated groundwater from 350 to 75 gallons per minute resulting in a net energy saving of \$3,300 for DLA as well a carbon emissions (as CO₂) reduction per year of 18 metric tons.

Judging Criteria

Program Management

DLA has taken an aggressive approach to management of the Tracy Site IRP resulting in the achievement of the goal to expedite the environmental remediation.

Project Schedule: In early 2010, DLA prepared a comprehensive project schedule identifying the necessary steps to reach the U.S. EPA's Construction Complete Milestone. The schedule included the design, construction and start-up of three separate remedies – NWC Groundwater, SWMU 20 SVE, and the Area 1/Building 237 soils remediation. Achievement of Construction Complete is a significant step in environmental protection and a milestone toward NPL de-listing.

Firm Fixed Price Contracting: DLA implemented annual, firm fixed price contracts to limit its risk. Achievement of milestones, site-specific expertise, and cost savings are necessary elements for contractors to remain engaged. In addition, DLA maintains a strong working relationship with funding managers to identify future funding needs and ensure funds are in place to avoid costly delays.

Decision Based Partnering: To keep the regulatory agencies (U.S. EPA, RWQCB and the DTSC) apprised of the status of the environmental program, DLA held monthly teleconference calls to discuss schedule, and quarterly meetings to address both schedule and technical issues.

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In 2009, when the California RWQCB recommended enforcement of a drinking water action level for dieldrin in an isolated NWC groundwater plume of the Tracy Site, DLA already had a mechanism in-place to address this technical challenge. The decision-based partnering allowed senior managers from each stakeholder to engage and to identify key issues. Ultimately, the agreed upon remedy saved DLA \$20 million dollars and 27 years of groundwater remediation activities.

These program management techniques (schedule, contracts and partnering) led to achieving DLA's goal to have all remedies in-place and operational. The techniques also led to significant cost savings including a savings of \$20 million dollars and 27 years of groundwater pump and treat remedial activities at the NWC. By clearly identifying scheduled milestones, DLA effectively communicated mission requirements to the project team. Clearly defined milestones enabled the IRP team to identify steps necessary to reach the Construction Complete goal while controlling and even reducing program costs. The key milestones achieved in FY 2011 – 2012 include:

- December 2011, the SVE system at SWMU20 was constructed and started.
- January 2012, the NWC groundwater remedy was constructed and started.
- August 2012, the second Five Year Review was finalized.
- August 2012, the Area 1/Building 237 soil remedy was completed.
- September 2012, The Construction Complete Milestone was achieved.
- September 2012, 50 percent of the groundwater extraction wells were shut-down because the ROD-specified clean-up goals were achieved.
- In September 2012, the SWMU 20 SVE system achieved ROD-specified clean-up goals.

Technical Merit

Examples of significant technical merit can be found in the pneumatic fracturing employed at the Area 1/Building 237 site to increase the permeability of the clayey soils and to enhance the soil vapor extraction remedy. Based upon the success of this innovative technology, pneumatic fracturing was employed at another site, SWMU 20, to increase the permeability of the clayey soils and to enhance the soil vapor extraction remedy at this location.

Combined sound technical merit and program management resulted in the successful installation and operation of three remedies in the past two years, completion of a five year review and the shut-down of half of the groundwater extraction wells, thus setting the stage for NPL delisting.

Continued optimization of the Tracy Site remedial systems decreased the groundwater sampling from 290 well events in 2007 to 220 well events in 2012 resulting in a cost savings of \$175,000.

Orientation to Mission

DLA focused the restoration program on achieving protectiveness of human health and the environment with minimal disruption to the mission. All cleanup strategies consider the future anticipated use of the site, and cleanup goals are negotiated with the regulatory agencies based upon DLA's Tracy Master Plan.

Transferability

Successes experienced by DLA at the Tracy Site have been and will continue to be shared within DLA and with the regulatory agencies. Tracy Site IRP staff formally meets twice each year with

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DLA headquarters to communicate restoration progress; and they also meet quarterly with the regulatory agencies to discuss technical aspects of site progress. With the proper management mindset, any agency can experience the successes demonstrated by the Tracy Site IRP staff. Key aspects of this success and transferability are a focus on common goals, firm-fixed price contracts, decision-based partnering, and frequent communications.

The Tracy Site IRP manager encourages its contractors and regulatory partners to share information regarding the successes of the Tracy Site within their respective trade organizations and agencies.

Stakeholder Interaction

DLA's use of Decision Based Partnering resulted in an effective community involvement program. DLA has maintained a publicly available Information Repository on-site and at a local public library, and has encouraged community involvement through distribution of fact sheets. In 2010, a community meeting was held to present and discuss the proposed plan for the NWC groundwater remedy. DLA's pro-active community involvement can be commended for the receipt of no public comments during the Tracy Site's NWC Proposed Plan public comment meeting and 30-day public comment period. This cleared the way for the project team to expeditiously complete the NWC ROD to obtain regulatory approval.

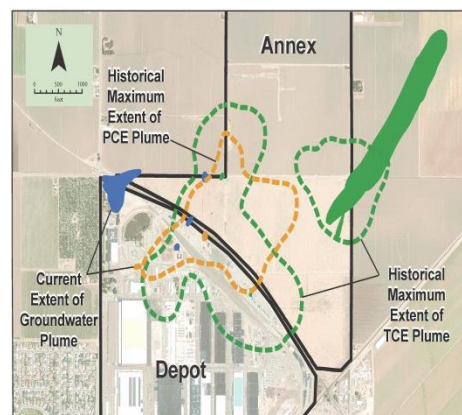
DLA also maintains an on-site public affairs official so that community members can comment on the program or request information from the Administrative Record.

The various fact sheets, the Information Repository, the public meeting for the NWC ROD, and the presence of an on-site public affairs official all contributed to DLA's success interacting with the state and local regulators and the surrounding community. Utilizing community outreach programs established earlier in the program's history, DLA has continued to involve the community in the decision-making process and in the overall success of the Tracy Site's IRP.

In 2011, the DLA hosted a tour of the Tracy site for the U.S. EPA, the RWQCB and the DTSC. The tour allowed the DLA to give on-site demonstrations of the remediation facilities and also allowed the regulatory agencies a first-hand review of the various remediation locations at the Tracy Site.

Project Impact

It is DLA's ultimate goal that the Tracy Site IRP does not endure over time. Once the goals of the program are achieved; there will no longer be a need for the IRP. The most significant impact of the IRP will be an environment that meets human health protectiveness standards and a distribution depot unencumbered from environmental land use restrictions.



The size of the groundwater plume at the Tracy Site have been significantly reduced from the historical maximum.