

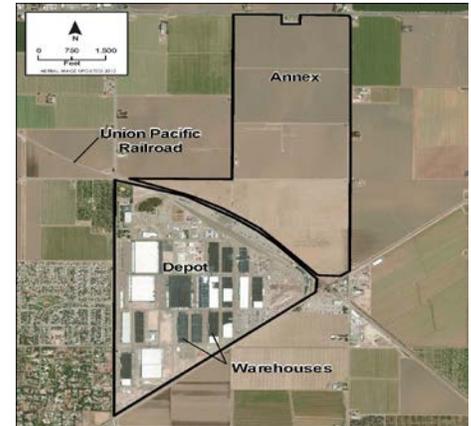
# 2018 SECDEF Environmental Awards

## Environmental Restoration – Installation: DLA San Joaquin

### Introduction

DLA Distribution Depot San Joaquin is an active distribution center 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 1,300 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 depot portion of the Tracy Site covers a 448-acre triangular parcel. The Annex, purchased in 1993, consists of 460 acres of agricultural land north of the operating 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.



The Tracy Site consists of the depot and the Annex totaling 908 acres.

### 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.

Current supply activities at DLA Distribution Depot San Joaquin 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). Between 1986 and 1992, an initial remedial investigation (RI) was conducted. The results of the RI led to the 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 the 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.

### Summary of Challenges

Cleanup of the site has been daunting for decades. Long-term challenges for the restoration of the site were threefold:

1. Technical: Three primary contaminant classes (volatile organic compounds (VOCs), pesticides, and petroleum hydrocarbons) are present in three different media (soil, soil gas, and groundwater). Remedial approaches and technologies differ for each contaminant class and each contaminated media.

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2. Regulatory: Oversight by the federal government (U.S. EPA) and two State of California agencies (RWQCB and the DTSC) requires compliance with both State and Federal regulatory criteria that has become increasingly stringent over the last several decades.
3. Community Relations: Off-site contaminant migration required purchase of the adjacent (annex) property to assure that the land would not be developed and residential water users would 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.

#### Organization, Staffing, & Management Approach

The 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. The restoration program is overseen by the IRP Manager at DLA with support provided by contractors with decades of experience at the site. DLA actively manages the program through the schedule to ensure deadlines are met and milestones achieved. Technical decisions are vetted through experts with our contractor partners, and funding is provided by DLA HQ.



Experienced staff onsite and around the country provided technical expertise

#### Community Involvement Programs

DLA has a robust community involvement program and executes the restoration program in accordance with the approved Community Involvement Plan. The plan was developed by DLA in collaboration and with the approval of the regulatory agencies. The plan provides guidance for record keeping, fact sheet distribution, community outreach for sampling access, and meetings for activities such as when milestones are reached.

Although there was not enough community interest to form a Restoration Advisory Board, DLA has been proactive in public communications. DLA maintains a publicly available information repository on-site and has encouraged community involvement through distribution of fact sheets. 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.

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.

Periodically, DLA hosts tours of the facility for the U.S. EPA, the California Regional Water Quality Control Board and the California Department of Toxic Substance Control. The tours allow DLA to give on-site demonstrations of the remediation facilities and also allows the regulatory agencies a first-hand review of the various remediation locations at the site.

#### Listing of Environmental Restoration Agreements/Environmental Restoration Plans/Dates

- 1990: - Installation added to National Priorities List
- Installation of Interim Remedial Measure system for the Operable Unit 1 groundwater plume
- 1991: - Federal Facility Agreement Signed
- Operable Unit 1 Interim Remedial Measure brought online
- 1992: - Operable Unit 1 Feasibility Study and proposed plan distributed
- Interim Remedial Measure treatment system repaired, tested and operated

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- 1993: - Federal Facility Agreement amended and Operable Unit 1 Record of Decision signed
- 1994: - Final comprehensive Remedial Investigation/Feasibility Study Phase I site characterization report produced
  - Operable Unit 1 Remedial Action plan produced
- 1995: - Environmental baseline study for Operable Unit 1 easements conducted engineering evaluation/cost analysis conducted for the industrial waste pipeline and sewage and industrial waste lagoons
- 1996: - Final underground storage tank comprehensive Remedial Investigation/Feasibility Study report produced
  - Final underground storage tank closure report produced
  - Explanation of Significant Differences Provided
- 1997: - Final 100 percent design produced for removal action for the sewage and industrial waste lagoons and industrial waste pipeline.
- 1998: - Site-Wide Comprehensive Record of Decision signed
  - Installation and startup of Groundwater Treatment Plant 2 for operable unit 1 groundwater plume
  - - Removal action completed for the sewage and industrial waste lagoons and industrial waste pipeline.
- 2000: - Final solid vapor extraction sites system designs produced
  - Final Institutional Control sites remedial action report produced
  - Final solid waste management unit ecological risk assessment produced
  - Solid vapor extraction remedy installed for Solid Waste Management Unit 1/Area 2, Area 1 Building 237, and Area 3
  - Bioventing remedy installed for Solid Waste Management Unit 24
- 2001: - Startup and operation of solid vapor extraction at Solid Waste Management Unit 1/Area 2, Area 1 Building 237, and Area 3 began
  - Startup and operation of bioventing system at Solid Waste Management Unit 24 began
  - Final Explanation of Significant Differences provided for selected remedies (SWMUs 2, 3, 7 and 23, Building 30 Drum Storage Area, and the Northern Depot Soils area)
- 2002: - Final pesticide remediation design completed
  - Source removal wells in Area 3 began operation
- 2003: - Final underground storage tank preferred alternatives report accepted
  - Pesticide extraction wells in the sanitary sewage lagoon plume installed and operational
  - Interim Remedial Measure plant dismantled and replaced with Groundwater Treatment Plant 1 granular activated carbon system.
- 2004: - Amendment to the 1998 Record of Decision produced for modification of selected remedial actions (Solid Waste Management Unit 4, Defense Site Environmental Reporting and Tracking System 72, and Operable Unit 1)
  - Final Remedial Action report, Solid Waste Management Unit 8 produced
  - Final Remedial Action report, Solid Waste Management Unit 4, 6 and 20 small excavations,

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- produced
- No Further Action status granted for 12 underground storage tank sites
- Explanation of Significant Differences to the 1998 Record of Decision produced for institutional controls
- Final Remedial Action report, Solid Waste Management Unit 27, produced
- Final Remedial Action report, Defense Site Environmental Reporting and Tracking System 67 cover, produced
- 2005: - Five-year Review Report produced
- 2006: - Groundwater Treatment Plant 1 shut down
- 2011: - Final Off-Depot Private Water Supply Well Contingency Plan submitted
- Finalization of the northwestern corner operable unit Record of Decision
- Finalization of the 2011 Explanation of Significant Differences
- Solid Waste Management Unit 20 SVE remedy in place
- 2012: - Northwestern corner remedy in place
- Removal action at Area 1/Building 237 complete
- Preliminary Close-Out Report signed
- Final Second Five-Year Review Report complete
- 2013: - Final Memorandum to the Site File Documenting Five Minor Modifications to the Defense Distribution Depot San Joaquin – Tracy Site –Wide Comprehensive Record of Decision
- NFA UST 25 Site Closure Letter
- 2015: - Remedy for northwestern corner completed. Based on the northwestern corner operable unit Record of Decision, four extraction wells in the northwestern corner shut down.
- Groundwater Treatment Plant 2 was converted from air stripping to liquid granular activated carbon.
- Final Third 5 year Review Report completed
- 2017 - SWMU 20, Area 1, and Area 2 SVE remedial actions were completed with regulatory approval
- Final Community Involvement Plan complete

#### Initiatives

In early 2010, the DLA prepared a comprehensive project schedule identifying the necessary steps to reach the U.S. EPA's Construction Complete milestone. Achievement of Construction Complete was a significant step in environmental protections and a milestone toward NPL de-listing.

Effective program management (schedule, contracts and partnering) led to achievement of the DLA's goal to have all remedies in-place and operational by 2012. By clearly identifying schedules milestones, the 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.

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Since 2012, the program has moved toward completion of the active remediation and reduction of groundwater impact areas to allow less required monitoring and treatment. Annual progress has supported these goals and brought DLA to a point where we are able to declare soil remediation complete. Groundwater remediation continues to require less effort.

#### Summary of Accomplishments

The most outstanding accomplishment at the site is simple: we have completed active soil cleanup at the entire site. This significant accomplishment is distinct from past accomplishments because never before have we been able to say – Done! Additionally, we continue to reduce requirements for long term monitoring, resulting in cost savings and return to mission for those areas. Finally, DLA is no longer in the UST business at San Joaquin! All USTs have been removed and closed, reducing the environmental liabilities associated with their presence.

To provide perspective in context of the entire cleanup program, it should be noted that DLA has been on an expedited cleanup track at San Joaquin for almost a decade. As described previously, the year 2010 provided the catalyst for accelerated cleanup when the U.S. EPA placed the site on a listing to achieve Construction Complete within two years. Seemingly impossible at the time due to the need for design and construction of three additional remedial actions and two additional decision documents, DLA scrutinized the program to develop an aggressive schedule that would achieve the Construction Complete milestone by 2012.

This accelerated schedule resulted in expedited remedial designs and remedy implementation, ultimately achieving the Construction Complete milestone within two years. The need for teamwork and collaboration among DLA, their contractors, regulatory agencies, and the community paved the way for continuing along a route of completing milestones and realizing cleanup completion.

#### **Soil Cleanup**

Going into the achievement period, DLA had performed soil remediation at multiple sites throughout the facility and was actively remediating soil at three locations. During 2017, DLA petitioned, and received regulatory agency concurrence, for completion of the soil vapor extraction (SVE) remedies at Solid Waste Management Unit (SWMU) 20, Area 1/Building 237, and SWMU 1/Area 2. Data collected at the sites, coupled with fate and transport models, demonstrated that the residual contamination remaining in the soils no longer poses a threat to groundwater. Therefore, DLA decommissioned the SVE system infrastructure, including 9 vapor extraction wells and 13 vapor monitoring wells, at SWMU 20. Decommissioning of the Area 1 and Area 2 SVE systems will be completed in 2018, restoring those areas for DLA mission use.

Active soil cleanup continues at only one site: Area 3. In 2015, DLA enhanced the effectiveness of the remedy by employing pneumatic fracturing of vadose zone soils to increase the permeability of the clayey soils and enhance the air flow and communication of the SVE well network. During pneumatic fracturing, high pressure gas is injected 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 vapor through the subsurface cracks.

Following the pneumatic fracturing and system enhancements, the SVE system at Area 3 resumed operations in August 2015. In 2016 and 2017, a total of approximately 9.5 pounds of volatile organic compound (VOC) mass was removed by the Area 3 SVE system. Latest data show that PCE and TCE concentrations have decreased to



Curtailing groundwater extraction and reducing operations and maintenance costs saved \$3.3 million and reduced carbon emissions by 18 metric tons.

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less than Record of Decision cleanup standards at all wells. This is a significant milestone that will allow DLA to shut down the SVE system and begin site closure activities in 2018.

Part of the ability to cease active soil cleanup is the incorporation of land use controls (LUCs). Use of LUCs provides the ability to incorporate information from the master plan on future reuse and returns the property for mission purposes.

#### **Groundwater Cleanup**

Prior to the achievement period, 85% of the operating extraction wells were shutdown resulting in a reduction of treatment plant flow rates from more than 700 gallons per minute (gpm) to less than 100 gpm. As a result, the air stripper groundwater treatment system at the GWTP was converted to a liquid-phase granular-activated carbon system in March 2015. This treatment system change resulted in a reduction of maintenance and power usage costs. During 2016, DLA decommissioned and removed the air stripper component at the GWTP. Further, because of the reduction in the volume of groundwater treated, the overland flow plots, consisting of approximately 4 acres of open land on the Annex property, were no longer being used for the infiltration of treated groundwater. During 2016, DLA restored the area and returned it for general agricultural use.

During the achievement period, optimization of the groundwater remedy, including monitoring, extraction and treatment, and discharge components, has been ongoing as concentrations of the contaminants of concern (COC) (trichloroethene [TCE], tetrachloroethene [PCE], and dieldrin) continue to decrease and plumes are reduced in size. Groundwater concentrations have reduced by more than 25% during the achievement period. Implementation of the groundwater remedy has been so successful in reducing COC concentrations that the majority of extraction wells have been shut down, and during the achievement period, DLA decommissioned a total of 11 extraction wells. In addition, DLA decommissioned 27 monitoring wells no longer needed to evaluate the performance of the groundwater remedy. Decommissioning of wells reduces DLA's environmental liabilities as well as restores land for mission use.

#### **Underground Storage Tank Program**

During the achievement period, DLA decommissioned 5 groundwater monitoring wells at the last open underground storage tank (UST) site at the depot (UST 25). With the decommissioning of the wells, DLA has achieved a milestone of closing all UST sites at the depot with regulatory agency concurrence.

#### **Innovative Techniques**

DLA has employed a number of innovative techniques over the years to pilot test evolving technologies and determine the best methods of environmental cleanup. The most effective technique has continued to be the use of pneumatic fracturing for improving effectiveness of SVE systems. Use of pneumatic fracturing has a history of success; when utilizing for the SVE system at SWMU 20, 170% more mass was removed than estimated in the FS in only 10 months of operation. This was a reduction of 14 months from the estimated time of operation.

Area 3 pneumatic fracturing provided a long term success for the SVE system. After completion of the fracturing, DLA was able to remove critical mass of the contamination that resulted in cleanup goals being met. This represents the last active VOC soil cleanup process. DLA is now able to move forward with evaluating the applicability of de-listing from the NPL.

Remedial action enhancements have resulted in a cost avoidance of more than \$20 million and nearly 30 years of treatment system operations and monitoring.

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DLA is further committed to ensuring selected remedies are incorporating “green” remediation components. We have consistently recycled system components such as reusing two 1,000-lb carbon vessels and over 1,000 feet of 6-inch diameter high density polyethylene piping for extracted water conveyance. Additionally, over the last 5+ years, DLA has been annually committed to shutting down operations and decommissioning monitoring wells no longer required for plume management. The reduction in the active extraction network has resulted in reducing pumped and treated groundwater from 700 gpm to less than 100 gpm resulting in a net energy savings as well as a reduction in carbon emissions.

#### Objectives of Program and Degree of Success

The objectives of the cleanup program for San Joaquin relate to the long-term challenges. We have achieved success in each of these areas during the achievement period.

1. **Technical:** The UST program is being dismantled and no longer poses an environmental liability for the site. Soil cleanup is now complete in all areas and no longer poses an environmental liability nor a continuing threat to groundwater. DLA continues to monitor the groundwater impacts and, based upon plume data that indicates a declining trend, makes strides towards decommissioning and closing wells as appropriate. Minimizing areas of groundwater impacts and monitoring makes those spaces available to DLA for accomplishing mission.
2. **Regulatory:** Oversight by numerous regulatory agencies requires deliberate communications and collaboration. Our history of partnership through frequent and routine communication avenues as well as partnership forums has provided a framework through which any arising disagreements can be addressed. During the achievement period, regulatory concurrence for UST closures, SVE shutdowns, and well decommissioning was critical, and DLA negotiated these outcomes successfully. We were also able to successfully negotiate completion of the SVE remedies although not all ROD-specific cleanup levels were met. This is a testament to the excellent working relationship we have with the agencies as well as our successful program management.
3. **Community Relations:** DLA’s relationship with our neighbors is strong. Historical off-site contaminant migration has been addressed and continues to be remediated. DLA continues to monitor other private property to ensure neighbors are protected. 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. 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.

DLA has a true working partnership with our regulatory agencies.

#### Orientation to Mission

DLA has focused the restoration program on achieving protectiveness of human health and the environment without disruption to the mission. All cleanup strategies consider the ongoing and future anticipated use of the site and environmental liabilities and impacts in accordance with DLA’s Strategic Plan.

#### Distinction from Past Success

As mentioned above, never before has DLA been able to say “complete” to active soil remediation. Success in this achievement period has brought DLA to a point of potential de-listing from the NPL, which was the ultimate goal in 1990 when San Joaquin was first listed. This milestone would not have been possible without the strong management of the program by DLA, the collaboration between DLA, Regulatory agencies, and our contractor teams, and the technical success realized through innovative techniques and contaminant fate and transport knowledge. It is truly a success worthy of recognition.