

Cleanup Enforcement in Action: Protecting Public Health and Planning for Reuse in Sacramento County, California

The Value of Environmental Enforcement

At the Aerojet General Corporation Superfund Site (“Site”), a 5,900-acre Site in Rancho Cordova, CA, the U.S. Environmental Protection Agency (EPA) worked collaboratively with California state and local government agencies and the potentially responsible party (PRP), Aerojet Rocketdyne (“Aerojet”), to reach an agreement on cleanup work that would protect public health, integrate a greener cleanup approach, support environmental restoration and renewable energy generation, and allow for environmentally responsible reuse. These outcomes will provide long-term benefits for the local community and the nearby municipalities in Rancho Cordova and Folsom, California. This case study shows how the Superfund cleanup enforcement program’s efforts to achieve a cleanup work agreement can be a cooperative and mutually beneficial process for all parties involved.

Cleanup work at the Site began with early and continuous communication between EPA and the various stakeholders about shared goals to clean up groundwater contamination and develop a solar renewable energy project to promote energy efficiency. EPA Region 9’s enforcement program (serving Arizona, California, Hawaii, Nevada, the Pacific Islands, and 148 tribal nations), state and municipal agencies, and Aerojet guided the Site investigations, phased remediation, and redevelopment and restoration planning.

EPA’s Region 9 office was involved throughout the cleanup process and supported continued beneficial reuse of the Site during various stages in the cleanup process.

Environmental Enforcement Benefits the Community

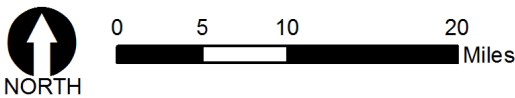
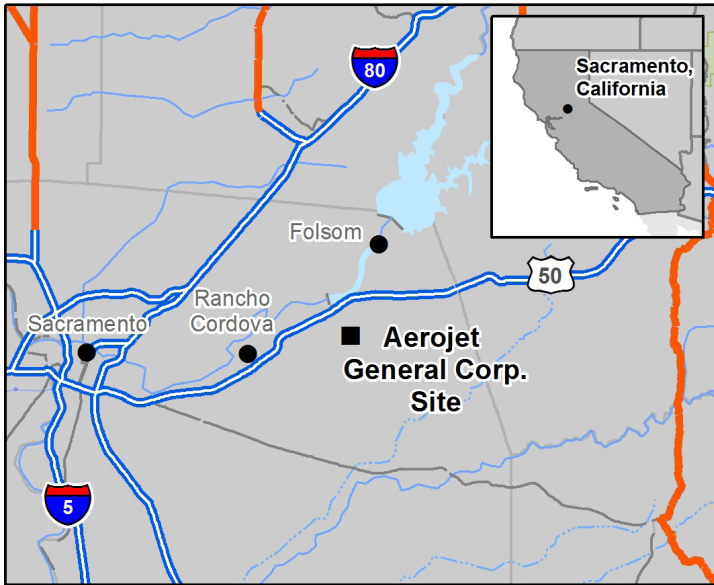
Environmental and public health factors affect people most significantly where they live. EPA works to provide strong, effective enforcement support to all communities. As the Agency conducts enforcement activities across the country, EPA looks for new ways to assist communities in pursuing sustainable development, such as supporting private sector-led reuse and encouraging the use of renewable energy to conduct remediation.

Greener Cleanup and Ecosystem Preservation at the Aerojet Site

The solar farm is estimated to offset 4,000 tons of carbon dioxide, 3 tons of sulfur dioxide, and 3 tons of nitrogen oxide emissions each year. Cleanup activities were limited to open space to assure ecosystem preservation. The Site contains habitat critical to wildlife, including 15 species designated as endangered, threatened or of concern. Implementation of the green remediation strategy resulted in a public involvement award from the National Association of Environmental Professionals in 2011.



EPA’s collaborative approach to oversight and review at the Site helped enable the use of sustainable greener cleanup technologies and the installation of a major solar project.



Sources: Esri, DeLorme, AND, Tele Atlas, First American, UNEP-WCMC and USGS.

The Site's location in Sacramento County, California.

Site Overview

The 5,900-acre Aerojet General Corporation Superfund Site is located 15 miles east of Sacramento. It includes parts of Sacramento County and spans unincorporated areas south of U.S. Route 50 and portions of Rancho Cordova (West) and Folsom (East), California. Approximately 96,000 people live within five miles of the Site.

Aerojet General Corporation, now Aerojet Rocketdyne, began operations at the Site in December 1950 for chemical manufacturing, as well as producing and testing rocket propulsion systems used in national defense, space exploration, and satellite deployment activities. Chemicals used in production and testing areas were released into soil and groundwater through discharge into storage lagoons and incineration.

EPA added the Site to the Superfund program's National Priorities List (NPL) in August 1983. Since then, EPA has worked with the California Department of Toxic Substances Control (DTSC) and the California Central Valley Regional Water Quality Control Board to oversee Aerojet's investigation and cleanup work. Aerojet's production operations remained active on parts of the Site until 2020, when the company moved its activities to other locations within the United States.

"Under the terms of the Site's agreement, Aerojet is required to consult with the Agency regarding any activity that might impact the protectiveness of the Site's remedy. EPA was pleased to work with the company to make this project happen."

— Gary Riley, EPA, Region 9

Developing a Strategy to Address Complex Site Remediation

Cleanup work at the Site began in the mid-1980s with the installation of groundwater extraction and treatment systems to prevent contaminated water from flowing off the Site. In 1989, EPA, the State of California, and Aerojet signed an agreement in which Aerojet agreed to complete a remedial investigation and feasibility study (RI/FS) for an 8,500-acre area encompassing several production and testing areas on the Site. The agreement also specified Aerojet's operation and maintenance responsibilities for five existing groundwater extraction and treatment systems as well as monitoring and replacement of drinking water wells.

After 12 years of investigations and site characterization, EPA, the State of California, and Aerojet updated the settlement agreement in 2001. The amended agreement redefined the Site boundary, reducing the Site's size to 5,900 acres, and divided the Site into nine operable units.



Aerial view of rocket fuel production and testing areas at the Site, 1963.

(OUs). OUs are smaller geographic areas of a site that are split up to help focus investigation and cleanup efforts. The division of the Site into OUs will allow EPA and Aerojet to effectively and efficiently evaluate conditions, identify practical cleanup options for the smaller areas and take action earlier.

Protecting Groundwater, Greener Remediation and Renewable Energy

The groundwater beneath the Aerojet Site is part of the San Joaquin groundwater basin, which provides drinking water to over a million residents in Sacramento County and nearby areas. Addressing groundwater contamination was a priority for the enforcement approach EPA took at the Site. Early work included the construction of several groundwater treatment operations and site investigation activities. The information Aerojet collected in its groundwater sampling and feasibility studies provided the basis for the record of decision (ROD) for the Western Groundwater OU and subsequent administrative orders negotiated between EPA and Aerojet. To date, Aerojet has built and operates 10 groundwater extraction and treatment systems across the Site.

Operation of the Site's groundwater treatment systems requires a large amount of energy. On average, the systems treat approximately 20 million gallons of groundwater per day. To address the energy consumption needed to clean up the groundwater, EPA worked with Aerojet to integrate greener cleanup practices at the Site. Greener cleanup practices include using renewable energy sources and improving the efficiency of treatment systems. Between 2009 and 2010, Aerojet and their solar development partners constructed a 6-megawatt solar project system producing 20 percent of the power needed to operate

Aerojet's extensive groundwater remediation program. It is one of California's largest solar farms.

Planning for Reuse

In the early 2000s, Aerojet owned over 12,000 acres of land in the rapidly growing Sacramento region. As the company's production facilities shifted to other locations, Aerojet began exploring the potential for reuse and redevelopment at the Site.

Redefining the Site boundary helped EPA focus its oversight efforts and allowed the property owners and local government stakeholders to focus potential reuse opportunities on approximately 2,600 acres along the northern Site boundary. The majority of this area contains groundwater that did not require soil cleanup, which meant that certain portions were carved out and removed from the Site. The reuse development plans focused on five master-planned developments, including residential and commercial redevelopment and civic spaces, including a new municipal park and designated open space within the City of Folsom, to support future growth east of Sacramento, California.

Interagency Collaboration

Collaboration between EPA and the state expedited cleanup at Area 40, another OU that is part of the Site located in Folsom, California. The Agency collaborated with DTSC's remedial action program to share oversight for Area 40 with the state agency once EPA approved a feasibility study for the area. EPA and DTSC signed a memorandum of understanding (MOU) that made the state the day-to-day technical lead for oversight of the PRP implementing the cleanup work. The cleanup plan

Greener Cleanups

"Greener Cleanups" is the practice of considering all environmental effects of remedy implementation and incorporating options to minimize the environmental footprint and maximize the environmental benefits of cleanups. By incorporating the use of renewable energy sources at Aerojet, EPA and its partners are maintaining the effectiveness of remediation methods while reducing greenhouse gas emissions from conventional power sources.



Solar project construction.



The Site's solar farm is one of the largest single-site industrial installations in the United States.

included the removal of over 35,000 tons of contaminated soil and the installation of a groundwater treatment system. Construction activities for the Area 40 cleanup were completed at the end of November 2020.

This federal and state collaboration resulted in administrative efficiencies for EPA and led to further collaboration across the cleanup work plan and the environmental quality review processes. With the state providing day-to-day technical oversight for Area 40, EPA could focus its resources on reaching agreements at source areas within the central part of the Site. Alex MacDonald, with the California Regional Water Board, notes “DTSC coordinated development of a remedial action plan for Area 40, which helped keep local land use planning processes on schedule.”

While our priority was protecting the integrity of the remedy, we were also interested in supporting an innovative, green remediation project like this. The Superfund program places a high value on supporting the return of sites to productive and beneficial use.

– Kevin Mayer, Former RPM, EPA, Region 9

Enforcement Makes a Difference

EPA's Superfund cleanup enforcement program makes a difference in thousands of communities affected by hazardous waste contamination. At sites such as the Aerojet General Corporation Superfund site, the enforcement program works to ensure that liable parties perform and pay for protective cleanups and support the revitalization goals of the nearby community and local government.

In northern California, the significant and sustained cooperation and communication among the parties—EPA, state agencies, and the PRP—enabled them to reach agreements and establish a roadmap for long-term cleanup at this large and complex site. In addition, the Agency's collaborative approach to oversight and review helped enable the use of sustainable greener cleanup approaches, including the installation of one of California's largest solar projects. Across the original 8,500-acre Site area, EPA took into account the redevelopment proposals by nearby communities and local and state governments throughout the cleanup process, laying a strong foundation for future sustainable growth at and near the Site.

For More Information, Please Contact:

Elisabeth Freed

Office of Site Remediation Enforcement

U.S. Environmental Protection Agency

freed.elisabeth@epa.gov | (202) 564-5117

Victor A. Zertuche

Office of Site Remediation Enforcement

U.S. Environmental Protection Agency

zertuche.victor@epa.gov | (202) 564-4212