National Guard Bureau
Reno Air National Guard Base

Environmental Restoration Program
Site 7 – Former Petroleum, Oil and Lubricant Storage Area

Site History

Environmental Restoration Program (ERP) Site 7 is the former Petroleum, Oil and Lubricant Storage Area at the Nevada Air National Guard Base (ANGB). This area consisted of four 25,000-gallon underground storage tanks (USTs) holding JP-4 fuel for flight line operations and ancillary equipment. These JP-4 fuel USTs had been in the ground for over 30 years.

Numerous, small JP-4 fuel spills have occurred around the refueling stand area of Building 42. Most of the spills occurred between 1973 and 1985, when the fuel trucks were top-loading vehicles. On several occasions, JP-4 fuel spills of up to 1,000 gallons occurred in this area. A fuel spill of up to 300 gallons occurred in June 1986, when a bottom-loading shutoff valve on a refueling unit failed to operate properly. Other smaller spills of up to 100 gallons have occurred during defueling of fuel trucks. Prior to the early 1980s, most of these spills were flushed into the soil/graveled areas surrounding the refueling stand.

Preliminary Assessment

In June 1988, ASG conducted a Preliminary Assessment at the ANGB. It focused on past and present generation, use, handling, and disposal practices of hazardous waste and materials. Site 7 was one of eight sites identified in the Preliminary Assessment as potentially contaminated with hazardous materials/waste and was recommended for further ERP investigations. Interim Removal Action (IRA).

Site Investigation

A Site Investigation (SI) was conducted at the ANGB by Oak Ridge National Laboratories/Environmental Technologies Section (ORNL/ETS) under agreement with the Hazardous Waste Remedial Action Program (HAZWRAP) operated by Energy Systems, Inc., in Oak Ridge, Tennessee. The results of the SI were reported in April 1994. The SI recommended a Remedial Investigation (RI)/Feasibility Study for Site 7 due to the presence of soil contamination above Nevada Division of Environmental Protection (NDEP) remediation criteria for total petroleum hydrocarbons, volatile organic compounds, and semivolatile organic compounds; and groundwater contamination above NDEP remediation criteria (maximum contaminant levels) for benzene. The SI also concluded that the source of the floating product appeared to be limited to the immediate area and not related to the upgradient JP-4 fuel tanks.

Remedial Investigation

ERM conducted an RI in 1995 and concluded that groundwater at Site 7 contained concentrations of benzene and bis(2-ethylhexyl)-phthalate exceeding their respective cleanup standards. It was suspected that the area of groundwater impacted by benzene might extend off the ANGB. However, it was not anticipated that the benzene-impacted groundwater extended a significant distance south of the ANGB fence line. Based on the RI data, it was recommended that a Feasibility Study be performed to evaluate remedial alternatives for product removal and for soil and groundwater remediation at this site.

Engineering Evaluation/Cost Analysis

ERM conducted an Engineering Evaluation/Cost Analysis to evaluate soil and groundwater remediation methods. The selected alternative included groundwater extraction,

treatment, and reinjection, with excavation and thermal treatment of soil at two source areas. The selected alternative was documented in an Action Memorandum.

Remedial Design and Installation

In 1998, ERM designed and oversaw the construction of the groundwater extraction, treatment, and reinjection system. This system included an oil/water separator and granular activated carbon adsorption. Following approximately 1 year of operation and maintenance (O&M), ERM optimized operation of this remediation system by combining the product-skimming system with the groundwater extraction system. Groundwater extraction activities were terminated in late 2003 due to the decommissioning and removal of the four 25,000-gallon USTs at the site.

Quarterly Groundwater Monitoring

ERM has also performed a site-wide groundwater monitoring program, including sample collection, laboratory testing and analysis, and preparation and submittal of quarterly reports to the NDEP.

Off-Site LNAPL Investigation

In 2002, ERM conducted an investigation downgradient of ERP Site 7 to assess off-site migration of LNAPL from Site 7. Four monitoring wells were installed and sampled in the vicinity of the Reno/Tahoe International Airport tower, downgradient of Site 7. These wells were measured for the presence of free product during subsequent O&M site visits. ERM used the investigation and monitoring results to modify and optimize the product recovery program.

Remedial Process Optimization

To support recommendations proposed in the 2004 Remedial Process Optimization (RPO) Report, ERM performed a limited investigation to further delineate the extent of the free-phase product at Site 7. Based on both historical and new data collected from this investigation, ERM prepared a remedial design workplan, which outlined procedures for soil removal and treatment of residual dissolved-phase impacts to groundwater at Site 7.

National Guard Bureau
Reno Air National Guard Base

Environmental Restoration Program
Site 7 – Former Petroleum, Oil and Lubricant Storage Area

Remedial Implementation

To support the selected remedial remedy outlined in the RPO Report, ERM implemented the removal of product-saturated soils at Site 7.

Within 6-weeks of field work implementation, ERM excavated and disposed of off site approximately 6,000 cubic yards of jet-fuel-impacted soil. Also, over 300,000 gallons of dewatering water was treated and disposed of under NPDES permit. Backfilling and compaction was completed immediately after excavation confirmation sampling, followed by complete site restoration in spring 2006. To address residual dissolved-phase impacts, ERM emplaced 1,425 pounds of oxygen releasing compound (ORC) within the excavation backfill. In addition, during backfill operations, an impermeable layer was installed along the southern portion of Site 7 to preclude migration of dissolved-phase impacts along the storm water utility line.

To address the dissolved-phase impacts in the upgradient and downgradient areas of Site 7 groundwater, ERM also emplaced additional 5,400 pounds of ORC slurry within 180 direct-push injection locations at the site (spring 2006). ERM is scheduled to perform groundwater monitoring in 2006 and 2007 to assess the effectiveness of the ORC to impacts to groundwater.

Results

The groundwater remedial actions completed to date have removed over 25,000 gallons of jet fuel from the subsurface of Site 7. Recently completed soil removal project effectively removed the majority of the free-product containing soil at the site. Effectiveness of the ORC placement in groundwater at the site will be evaluated after subsequent groundwater monitoring events.