National Aeronautics and Space Administration

FIVE YEAR REVIEW 2012 TO 2017

JET PROPULSION LABORATORY GROUNDWATER CLEANUP PROGRAM

Second Five-Year Review of Operable Units 1 & 3

INTRODUCTION

NASA is cleaning up groundwater beneath and near the Jet Propulsion Laboratory (JPL) related to past activities at JPL. The cleanup includes the removal of volatile organic compounds (VOCs) and perchlorate from groundwater. These chemicals originated from long discontinued waste disposal practices during the 1940s and 1950s when wastes from JPL drains and sinks were disposed of in brick-lined seepage pits – a waste management practice that was common at the time.

The cleanup is being accomplished through water treatment systems known as "remedies." The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), also known as Superfund, requires that the implementation and performance of ongoing remedies at CERCLA sites be reviewed at least every five years. This is the second Five-Year Review for the JPL CERCLA site, covering the period from February 2012 to January 2017. The overall purpose of each Five-Year Review is to determine whether the remedies in place continue to be protective of human health and the environment. From September through November 2016, NASA – in conjunction with the U.S. Environmental Protection Agency (U.S. EPA) and State regulators – conducted this review. The purpose of this fact sheet is to summarize findings from the Second Five-Year Review Report. The full report is posted on the NASA JPL Cleanup Program website (https://jplwater.nasa.gov).

NASA is **cleaning up** groundwater beneath and near the Jet Propulsion Laboratory

REMEDIAL ACTION SUMMARY

Cleanup activities at NASA JPL are at three areas known as Operable Units (OUs). OU-1 addresses groundwater beneath the JPL "source area," and OU-3 addresses deep groundwater off-facility, or beyond the JPL fence line. Both OU-1 and OU-3 are included in this Five-Year Review. Cleanup activities at OU-2, within the dry soil beneath the source area, were completed in 2007.

Source area groundwater (OU-1) treatment activities consist of a liquid-phase granular activated carbon (LGAC) system for VOCs removal and a fluidized bed reactor (FBR) system for perchlorate treatment, filtration, and removal. Off-site groundwater treatment (OU-3) is operating at two sites: the Monk Hill Treatment System (MHTS) in the City of Pasadena and at wells operated by the Lincoln Avenue Water Company (LAWC) treatment system in Altadena. These treatment systems remove perchlorate from groundwater using ion exchange systems and remove VOCs using LGAC systems. After NASA's chemicals are removed from groundwater, the treated water is disinfected and used by Pasadena and LAWC for drinking water.

Since the last Five-Year Review was completed in 2012, the three groundwater treatment systems have operated continuously. They removed from groundwater a combined total of 1,619 lbs. of perchlorate, 95.3 lbs. of carbon tetrachloride and 91 lbs. of trichlorethylene. These systems have continued to prove effective in removing dissolved chemicals originating from JPL, preventing the migration of the chemical plumes, and allowing beneficial use of the groundwater aquifers. In addition, a third, deeper, drinking water well was installed in 2016 to enhance the LAWC treatment system. Infrastructure improvements are underway at the site and the new well is expected to be operational in 2017.

FIVE-YEAR REVIEW PROCESS

The second Five-Year Review process integrates information taken from documents outlining the remedies and operational data with the experiences of those responsible for, and affected by, actions at the site.

There are five components to the Second Five-Year Review.

Community Involvement and Notification

Activity to involve the community in the second Five-Year Review process included a public notice posted to the JPL CERCLA Program website (https://jplwater.nasa.gov) in September 2016. The notice pointed out that any questions regarding the process should be directed to the NASA Manager for Community Involvement, Merrilee Fellows. No comments or questions were received. A second update, including this fact sheet, is posted on the project website, along with a link to the Second Five-Year Review Report. Information about the Five-Year Review is also referenced in the Program's 2016 Year in Review, published in January 2017 and also posted on the website.

Document Review

Documents were reviewed to obtain relevant information and data covering each treatment system, to evaluate performance and effectiveness. Documents examined included investigation reports, decision documents, quarterly groundwater monitoring reports, construction and installation reports, and treatment system progress reports.

Data Review and Analysis

The data review included examination of sampling and monitoring activities, operations and maintenance (O&M) reports, and other remedy performance documentation (the primary basis for the technical analysis and final protectiveness determination). Data review included treatment system monitoring data, groundwater monitoring information, risk assessment information and regulatory standards to identify any changes to the protectiveness of the selected remedies. Groundwater sampling data were used in evaluating protectiveness of the remedies, and data trends over time were evaluated to determine the progress made toward achieving the remedial action objectives at each OU.

Site Inspection

The purpose of the site inspection is to provide information about a site's status and visually confirm and document the conditions of the remedy, the site and the evidence regarding the protectiveness of the remediation systems and monitoring equipment. Site inspections were performed as part of the Five-Year Review. In addition, site inspections have been ongoing during this second Five-Year Review period, and semi-annual and annual progress reports for the OU-1 and OU-3 systems, respectively, are submitted to Federal Facilities Agreement signatories and other stakeholders. The condition of monitoring wells is observed during quarterly groundwater monitoring, and maintenance activities are completed when necessary to ensure the wells are maintained in good condition.

Interviews

NASA interviewed representatives of LAWC and Pasadena Water & Power (PWP) regarding community involvement measures undertaken by NASA during the groundwater cleanup. In addition, individuals responsible for or familiar with current activities at OU-1 and OU-3 were given the opportunity to review and provide comments on this draft Five-Year Review Report. They include representatives from the U.S. EPA, the California Department of Toxic Substances Control (DTSC) and the Regional Water Quality Control Board (RWQCB).

FIVE-YEAR REVIEW Summary& Conclusions

Based on all of the data and information, the treatment systems are performing as designed. No new information that would compromise the protectiveness of the selected remedies was identified. The Five-Year Review shows that the remedies at both OU-1 and OU-3 continue to be protective of human health and the environment. Potential exposure pathways that could result in unacceptable risk (i.e., ingestion and contact with chemicals in groundwater) are being effectively controlled through groundwater extraction and treatment by the MHTS and the LAWC treatment system, and routine monitoring of these systems. Treated water from both the MHTS and the LAWC system is in compliance with all water quality requirements specified by federal and state regulations, with concentrations below California Maximum Containment Levels (MCLs).

Some recommendations were made in the Second Five-Year Review Report to enhance the effectiveness of the OU-1 remedy. They included replacing the fluidized bed reactor with ion exchange to achieve perchlorate removal within the source area, and adding a new well at the OU-1 system to enhance removal of VOCs and perchlorate.

2012 TO 2017

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