



2022 Year in Review

JPL GROUNDWATER CLEANUP PROJECT

This 2022 Year in Review is part of NASA's ongoing efforts to keep the public informed about the progress of groundwater cleanup efforts at and in the vicinity of NASA's Jet Propulsion Laboratory (JPL).

BACKGROUND

The groundwater chemicals being addressed are volatile organic compounds (VOCs) and the chemical compound perchlorate. The chemicals originated from long-discontinued liquid and solid waste disposal practices during the 1940s and 1950s when wastes from JPL drains and sinks were disposed of in brick-lined seepage pits and waste pits – a waste management practice that was common at the time. Today, chemical wastes are either recycled or sent off-facility for treatment and disposal at permitted hazardous waste facilities. NASA continues to meet or exceed all environmental regulations and is cleaning up the site under the Federal Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), commonly known as Superfund

Groundwater cleanup activities at and in the vicinity of JPL continued on schedule in 2022

Groundwater Removal of VOCs and Perchlorate Advances in 2022 at JPL

Groundwater cleanup activities at and in the vicinity of JPL continued on schedule in 2022 in line with NASA's ongoing commitments:

To clean up groundwater associated with long-discontinued solid and liquid waste practices at JPL, and | To keep the public informed and involved with the cleanup as much as possible.

Groundwater removal of VOCs and perchlorate advanced at JPL in 2022 at three NASA-funded groundwater treatment plants – one located on JPL property; another in Altadena operated by the Lincoln Avenue Water Company (LAWC); and a third plant above the Arroyo Seco at the Windsor Reservoir.

Year 2022 Cleanup Progress at the Three NASA-Funded Treatment Plants

Cleanup action continued in 2022 with operations and maintenance at the onsite groundwater treatment system at JPL, at the City of Pasadena treatment system, at the LAWC plant, and with the monitoring of the cleanup progress by sampling JPL-area groundwater monitoring wells. The ongoing drought did impact efforts with certain monitoring locations not able to be sampled due to groundwater levels falling below the sampling location.

Throughout the year, NASA also continued to closely follow its final cleanup plan, as outlined in the 2018 Record of Decision (ROD) approved by federal and state government agencies as the best approach to reaching the cleanup goals and to maintaining protection of human health and the environment.

In April, a Third Five-Year Review [<https://go.nasa.gov/3GA85G8>] for the JPL CERCLA site was filed, covering the calendar years from 2017 to 2021; it had earlier been approved by federal and state regulators with a concurrence from the US EPA. A factsheet [<https://go.nasa.gov/3W7c96p>] on the Third Five-Year Review was also completed and posted on the CERCLA Project website.

“Source Area” Groundwater Cleanup Progress in 2022

In 2022, the source area treatment system continued to operate without a hitch. More than 2141 pounds of perchlorate as well as 49 pounds of VOCs have now been removed from groundwater beneath JPL since system startup in January 2005. The total amount of unwanted chemicals in groundwater beneath JPL has been reduced by more than 98 percent.

While chemical removal has been significant, it can be difficult to remove the lower levels of contaminants. NASA remains committed to continue with treatment until the levels are below the stringent cleanup goal set forth in the ROD. Continued operation of the system to achieve that cleanup goal in groundwater is expected to take another five to ten years. This is typical in groundwater remediation because chemical removal gets more difficult as concentrations decrease. It takes a long time to flush enough water through the aquifer to achieve the very low cleanup goals (i.e., in the parts-per-billion concentration).

Year 2022 Groundwater Cleanup Progress in the Arroyo Seco

The NASA-funded Monk Hill Treatment System (MHTS) consists of four City of Pasadena drinking water wells in the Arroyo Seco and a treatment plant located on Windsor Avenue. NASA and Pasadena Water and Power (PWP) continued in 2022 with planning to construct a new NASA-funded drinking water well located in the northern portion of the Arroyo. The new well would increase removal of targeted chemicals by an estimated 40 percent, and it would reduce the time needed to clean up the aquifer. Since system startup in 2011, the MHTS has removed more than 1,430 lbs. of perchlorate and more than 234 lbs. of VOCs. Chemical levels in groundwater extracted by the MHTS in the Arroyo have been reduced by more than 90 percent.

Year 2022 progress at LAWC Drinking Water Wells in Altadena, at the Outer Edges of the Affected Area

The Lincoln Avenue Water Company (LAWC) system, with three drinking water wells since a third NASA-funded well was put into operation in late 2017, has removed more than 1,438 lbs. of perchlorate and more than 348 lbs. of VOCs since startup in 2004. Chemical concentrations in the LAWC groundwater have now been reduced by more than 80 percent.

Continued Groundwater Monitoring

With 25 monitoring wells on and in the vicinity of JPL, NASA can demonstrate that the treatment systems in place continue to be effective in remediating the affected groundwater. Quarterly monitoring reports for 2022 continued to be filed in 2022 and are posted at the groundwater cleanup website at [<https://jplwater.nasa.gov/Docs/NAS710681.HTM>]. NASA also continued weekly monitoring of perchlorate levels in wells at the nearby Rubio Cañon Land and Water Association (RCLWA), when available due to 2022 well maintenance.

NASA Expands Investigations to Include Per- and Polyfluoroalkyl Substances (PFAS)

In August, the US Environmental Protection Agency (US EPA) proposed designating two per- and poly-fluoroalkyl substances (PFAS) as “hazardous substances.” If promulgated, the two PFAS compounds would be regulated under CERCLA.

Since 2019, NASA had already been investigating PFAS as a part of an agency-wide proactive approach to understand and address this emerging group of contaminants. Considering the proposed US EPA designation, NASA is now including PFAS investigation activities at JPL as part of the CERCLA water cleanup program. A fact sheet on NASA’s PFAS investigation efforts was published on the CERCLA Project website [<https://go.nasa.gov/3QA821u>] and other documents pertaining to PFAS activities have also been added.

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“NASA remains committed to ongoing open communication in all groundwater cleanup activities at JPL”

Next Steps Regarding PFAS

Additional groundwater and soil samples were collected in December by NASA with regard to PFAS, and results were expected early in 2023. These results will be posted on our website [<https://jplwater.nasa.gov/>]

NASA is committed to implementing the PFAS investigation at JPL based on the latest scientific information and regulatory guidance available. There are currently EPA-approved analytical methods for 29 unique PFAS in drinking water with that number likely to expand as new EPA-approved methods and certified laboratories become available. New samples collected will be evaluated, and previously gathered data are being re-evaluated, guided by EPA's new health advisories and regional screening levels. Results will determine any next steps for investigation.

Although investigations continue, two technologies that have been shown to be effective in removing various PFAS from groundwater (liquid granular activated carbon (LGAC) and ion exchange (IX) are already in place and have been effectively removing perchlorate and VOCs from groundwater as part of NASA's CERCLA groundwater cleanup program at JPL.

Community Outreach

NASA remains committed to ongoing open communication in all groundwater cleanup activities at JPL, and community outreach remains a cornerstone of the program.

During 2022, NASA community outreach included the following:

- Continued maintenance of the CERCLA Project website at [<https://jplwater.nasa.gov/>]. This included document updates, software/programming/security updates, and posting of other content.
- January distribution of the 2021 Groundwater Cleanup Project Year in Review [<https://go.nasa.gov/3Ad1ayJ>]
- In April, NASA completed and posted to the website the Third Five Year Review [<https://go.nasa.gov/3GA85G8>]
- Later in April, NASA completed and posted to the website a fact sheet on the Third Five Year Review, [<https://go.nasa.gov/3W7c96p>]
- Completed and posted to the website the 2021 Annual Institutional Controls (IC) Report [<https://jplwater.nasa.gov/docs/NAS710674.pdf>]. The final Record of Decision requires an annual IC report to review the effectiveness of ongoing groundwater treatment and a discussion of actions taken to prevent exposure to impacted groundwater at JPL and in neighboring areas.
- In August, NASA made significant updates to the Cleanup Project Backgrounder and posted the 2022 Backgrounder update on the CERCLA Project website at [<https://go.nasa.gov/3isschv>]
- In December, NASA posted a factsheet on its PFAS site Investigations [<https://go.nasa.gov/3QA821u>]

For additional information on NASA activities during 2022, or for general information or inquiries regarding the CERCLA Groundwater Project, contact:

Steve Slaten

NASA Office of JPL Management and Oversight
4800 Oak Grove Drive, Pasadena, California 91109

Phone (818) 393-6683 Email: sslaten@nasa.gov

Project Website <https://jplwater.nasa.gov>

Para Más Información En Español, llame a **Angel Castillo**
NASA JPL, Teléfono (818) 354-1585