

N3B's Fiscal Year 2020 End of Year Report

Executive Summary

In fiscal year (FY) 2020, N3B met all Consent Order milestones and accomplished several project performance goals in support of cleaning up legacy waste at Los Alamos National Laboratory (LANL) — or radiological and chemical waste primarily generated during the Manhattan Project and Cold War eras — for the U.S. Department of Energy's Environmental Management Los Alamos Field Office (EM-LA).

The COVID-19 pandemic, during the second half of FY20, presented unique challenges as N3B developed and implemented policies, controls and processes to protect N3B employees and their families from the virus. When N3B received a partial stop-work order from EM-LA on March 24, 2020, we reduced work to authorized essential mission critical activities (EMCA).

At the end of FY20, N3B remained in Phase Two of its Resumption of Operations plan, fully executing the field mission while continuing telework to the maximum extent practicable.

Contact-handled Transuranic Waste Program FY20 Accomplishments



- ▶ N3B made four TRU shipments in July to WIPP, the radioactive waste repository where defense-generated TRU waste gets stored 2,150 feet underground in an ancient salt bed.

TRU waste processing and shipments

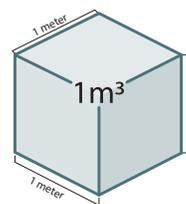
- Coordinated with Triad for use of LANL's Radioassay and Nondestructive Testing facility, which provides the opportunity for indoor loading of transuranic (TRU) waste shipments. N3B has been loading its TRU shipments outdoors, where inclement weather can limit operations.
- **Remediated and repackaged** for shipment to the Waste Isolation Pilot Plant (WIPP) in Carlsbad — **or reclassified** as low-level waste for shipment to Permafix Northwest in Richland, Washington — more than **66 cubic meters of TRU waste**, exceeding our target of 60 cubic meters.
- Completed **5 TRU waste shipments**.
- At the end of FY20, N3B had 553 containers of TRU waste, which would amount to about **25 shipments, certified and ready for WIPP**. With WIPP reducing its waste shipments due to COVID-19, N3B shipments were impacted, thus creating a backlog of TRU waste shipments.
- **Note:** N3B plans to make approximately 30 TRU waste shipments in FY21, 11 of which have already been completed.

Mixed low-level (MLLW) waste shipments

- Successfully shipped **343 cubic meters of MLLW on schedule** to Energy Solutions in Clive, Utah, exceeding our goal of 325 cubic meters.



343
cubic meters of
MLLW shipped



=



~264
Gallons



- ▶ The hydraulic shear for cutting corrugated metal pipes in Dome 375 at Area G.

Corrugated Metal Pipes (CMP) Campaign initiation

- Completed design of a facility and purchased equipment to **process 158 corrugated metal pipes (CMPs) filled with cemented wastewater treatment sludge**, which were buried underground at Area G in the 1970s. The pipes are about 20 feet long and 30 inches in diameter. They weigh about 14,000 pounds each.
- CMP campaign work was paused due to COVID-19. Installation of a hydraulic shear, which will cut the CMPs for packaging and shipment to WIPP, is planned for FY21.



GLOVEBAG

A containment area where a TRU waste drum can be securely emptied without spread of contamination. Then waste processing operators (WPOs) can sort, segregate, remediate and repackage the waste to meet WIPP's waste acceptance criteria. WPOs access the waste through an opening in the containment where a glove is permanently attached, which allows them to manipulate waste safely.

► Waste processing operators participate in a glovebag training and mockup session.

Glovebag and drill & drain process lines

pH LEVELS

Balancing the pH levels, or acidity of the liquid, so it's non-corrosive, and then adding absorbent, helps minimize the potential degradation of a container and makes it compliant for disposal at WIPP.

- Installed all equipment for two glovebag process lines, and set up one drill and drain process line, in Area G.
- By affording the required level of protection for processing a certain category of TRU waste, glovebags will potentially enable processing of about 1,472 containers of TRU waste for disposal at WIPP.
- Drill and drain operations allow waste processing operators to remediate waste if liquid exists in a container. Waste operators remove liquid from the container; use a reagent to bring its pH to an acceptable level, if necessary; and add absorbent to

turn that liquid into a solid. Then the waste can be repackaged for disposal at WIPP.

- Performed mockups and self-assessments of glovebag and drill and drain process lines. Field work was paused due to COVID-19, but project was ahead of schedule prior to the work pause.



► Waste processing operators participate in a training and mockup session of the drill and drain process line.

Operational Excellence Initiative

- Established the Operational Excellence Initiative (OEI), a **training program for employees unable to telework during EMCA**. OEI allowed about 180 CH-TRU employees to accumulate around 70,000 hours of instruction to support mission objectives.
- Employees amassed about \$3.3 million of productive cost versus COVID-19 at home pay. The program was recognized as a complex-wide best practice.

► Frank Martinet takes a break from the OEI with his sons, who served as his "assistants" while N3B was in Essential Mission Critical Activities status.





Workforce Development Program

► Students in N3B's first WPO Boot Camp cohort at the UNM-Los Alamos campus.

- Trained 22 students to become fully qualified radiological control technicians, waste processing operators or nuclear operators. Our boot camps and apprenticeship program help **foster a well-paid, highly skilled, homegrown workforce.**

Environmental Remediation Program FY20 Accomplishments

Continued success on Chromium Interim Measure and Characterization Campaign

- Continued successful implementation of the Interim Measure pump-and-treat system to address chromium groundwater contamination. A significant buffer was established between the edge of the chromium plume beneath Laboratory property and the property line of the adjacent Pueblo de San Ildefonso tract.
- **Treated 65.7 million gallons of chromium-contaminated groundwater** and met two FY20 Consent Order milestones related to the chromium project.
- The chromium treatment system was shut down during EMCA, but groundwater samples taken after EMCA showed no increase in the level of chromium contamination at five injection wells.



**65.7 Million
Gallons of
Treated Cr GW**



Drilling work plans for additional monitoring wells at chromium plume

- Submitted **drilling work plans to the New Mexico Environment Department (NMED) for additional wells** at the chromium plume.
 - Samples from one well will help N3B assess the reason for a rising concentration of chromium in the northwestern portion of the plume. The second well will help fill a data gap between LANL's boundary with the Pueblo de San Ildefonso.
- *N3B's cultural resources specialist monitors nearby cultural sites during ground-disturbing activities as the pad for a new groundwater monitoring well is built.*

Reconfiguration of monitoring well to better protect groundwater

- **Reconfigured a groundwater monitoring well** in February 2020 that would give advanced **warning of any groundwater contamination migrating south** of the laboratory's boundary.

MONITORING

Monitoring helps determine the fate and transport of known legacy waste contaminants, detect new potential contaminants from previous releases, evaluate the efficacy of remedies and support corrective measures.



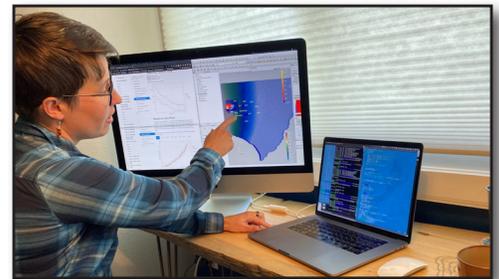
Completed groundwater monitoring at 153 sites

- Collected groundwater samples at 153 locations on and around LANL property — including wells, springs and surface water sources — for monitoring year 2020, which ran October 1, 2019 - September 30, 2020.
 - All groundwater sampling was suspended during EMCA. Once Phase One operations resumed, crews accounted for as many missed samples as possible.
 - Submitted our groundwater monitoring plan for monitoring year 2021 to NMED in June.
- Groundwater sampling at well R-50 during the FY20 monitoring year.



Model and risk assessment completed on RDX in deep groundwater

- Completed in May 2020 a predictive model that forecasts the fate of contamination from Royal Demolition Explosive, or RDX, found in a portion of deep groundwater at LANL.
- Modeling shows that the high explosive plume in the deep groundwater **will not advance substantially toward water supply wells in the next 50 years.** Additionally, due to LANL access and land use controls, no drinking water wells will be drilled in the area where RDX is present.
- A risk assessment report submitted to NMED ultimately indicates that no immediate risk to human health is posed by the RDX plume. Long-term monitoring of the plume is recommended.



► A hydrologist from Neptune and Company, who partnered with N3B to create the Fate and Transport Model of RDX in deep groundwater.

Storm water monitoring, inspections and construction under Individual Permit

- Built 26 new storm water controls on and around LANL property to mitigate potential migration of storm water.
- Conducted 664 storm water control inspections.
- Work was impacted by COVID, as well as exceptional drought conditions in Los Alamos County. All samplers that collect storm water in response to a precipitation event were activated by August 31, 2020.

► Inspection of a storm water sampling station in Pueblo Canyon, which assists crews in monitoring runoff from a former LANL site.



Soil Remediation



2,175

Soils samples collected and analyzed



1,945

yd³ of contaminated soil and debris remediated



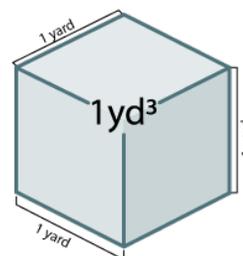
608

yd³ of low-level waste shipped for offsite disposal



1,722

yd³ of mixed low-level waste shipped for offsite disposal



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Middle DP Road

- Conducted **trench work** on a parcel of land at a housing development construction site on DP Road, adjacent to where a county contractor found legacy waste materials. The site was historically used by LANL and transferred to Los Alamos County from the DOE years ago. N3B **found no contaminated materials** on this land parcel.
- Prepared for sampling to gain further confidence that radioactively contaminated debris will not be encountered west of the recently dug trench.



► Trench work and radiological readings at a land parcel on Middle DP Road.

Historical Properties campaign

- Characterized and remediated sites in Los Alamos Canyon where the disposal of legacy solid waste is known or suspected, and that sit on or adjacent to what is now the Los Alamos town site. Also shipped for disposal contaminated soil and debris from these sites.
- Fieldwork related to this campaign is complete, pending NMED approval.

Known Cleanup Sites campaign

- Completed investigation, remediation and restoration of soil under the Known Cleanup Sites campaign, the **first Consent Order campaign to be completed at LANL**. Known Cleanup Sites are areas where the historical disposal of solid waste was known or suspected, and that were identified over the past 10 years as containing contaminants that exceeded targets for carcinogenic and non-carcinogenic contaminants.

Shipment of transition materials

- **Shipped for offsite disposal about 120 cubic meters of soil, metal and debris and nearly 103,000 gallons of purged well water** inherited from LANL. This work was added to N3B's contract for FY21 and was ahead of schedule at the end of FY20.



**120
cubic meters of
soil shipped**

Vapor monitoring at MDAs C & L

- Continued monitoring and sampling soil vapor plumes at Material Disposal Areas for potential new releases and plume rebound. Vapor monitoring will support a final remedy determination for these MDAs.

Demolition and decommissioning of TA-21's Building 257



- Conducted initial waste characterization of TA-21's industrial waste lines and Building 257 — which served as LANL's Cold War-era radiological liquid waste treatment facility — in preparation of demolition and decommissioning, and a land transfer to Los Alamos County.
- Found unanticipated levels of radiological contamination and halted initial demolition activities to re-evaluate the facilities' hazard categorization and necessary controls.

► Building 257 at Technical Area 21, in the industrial area of Los Alamos, south of Los Alamos County Airport.



FY 2020 Safety Metrics

N3B's safety performance in FY20 was very good with only three minor injuries. We look forward to continued improvement next year. The TRC and DART rates are important measures of safety. They are common OSHA measures that show how often a recordable injury or illness occurs at a business. A recordable injury is any injury that requires treatment beyond first aid.

N3B's OSHA safety reporting metrics are well below the Department of Energy Environmental Management's targets of less than 1.1 and 0.6, respectively.

N3B Total Recordable Cases (TRC) Rate

Our Total Recordable Case (TRC) rate is 0.45

This metric is **well below** the Department of Energy Environmental Management's **target of less than 1.1**

N3B Days Away, Restricted or Transferred (DART) Rate

Our Days Away, Restricted or Transferred (DART) rate is 0.15

This metric is **well below** the Department of Energy Environmental Management's **target of less than 0.6**



0.45
N3B FY20 Total Recordable Case Rate



1.10
DOE Office of Environmental Management FY20 Threshold



0.15
N3B FY20 Days Away, Restricted or Transferred (DART) Rate



0.60
DOE DART Office of Environmental Management FY20 Threshold

