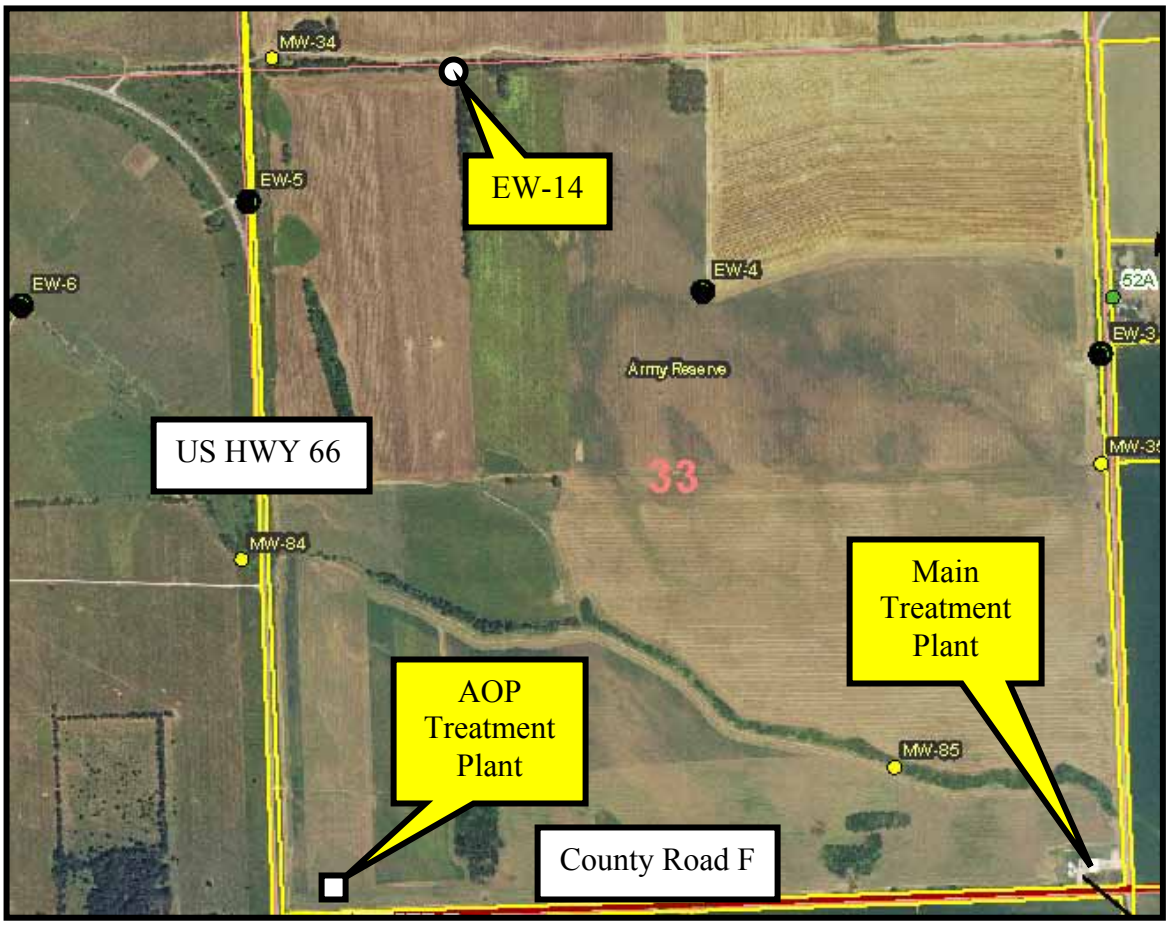
US Army Corps of Engineers®

FORMER NEBRASKA ORDNANCE PLANT

MARCH 2008 PROJECT UPDATE

NEW CONSTRUCTION AT MEAD

The Army Corps of Engineers has a number of construction activities in progress to support environmental cleanup actions at the site. Construction on the Advanced Oxidation Process (AOP) treatment plant is nearing completion. Geologic testing in preparation for the installation of a new extraction well, EW-14, is underway. Also, excavation for removal of metals contaminated soils under Operable Unit 3 will start in April. Details on these three projects follow.



ADVANCED OXIDATION PROCESS SYSTEM

Exterior of AOP treatment building

The Army will put Extraction Well (EW) 11 back into operation this month. EW-11 will function to cut off the plume on the western side of the site (Load Line 1) and reduce the amount of time it takes to clean it up. Because high levels of trichloroethylene (TCE) contamination in this well would strain the main groundwater treatment plant, a pretreatment system has been constructed to reduce TCE levels in the water before it reaches the main plant.

This pretreatment system uses an Advanced Oxidation Process (AOP) process that destroys contamination in the pipeline before it reaches the treatment plant. Designed to treat primarily volatile-organic contaminated (VOC) groundwater, this system has a flow rate of 550 gallons per minute (gpm). AOP will reduce trichloroethene (TCE) levels from 7,000 micrograms per liter µg/L (ppb) to less than 10 ppb.

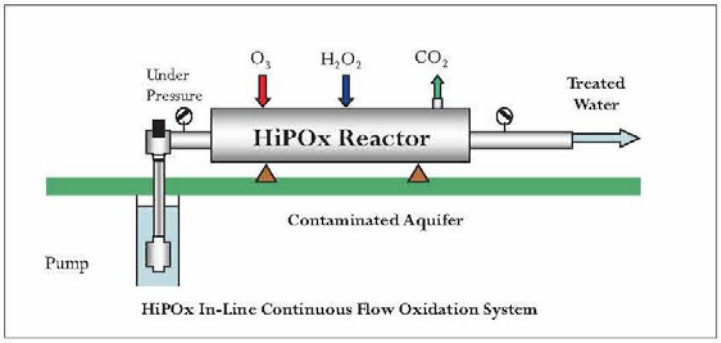
AOP System Description

The AOP system consists of:

- A 100-horsepower submersible well pump at EW-11 that moves contaminated water for treatment at the AOP system
- A HiPOx™ oxidation system consisting of process equipment including an oxygen generator, an ozone generator, and a hydrogen peroxide system
- Valves and instrumentation, including pressure gauges, hygrometers, gas monitors, pressure switches, flow meters, flow and pressure transmitters, and level switches
- Controls and remote telemetry (consisting of a modem and radio antenna) that communicate with the main treatment plant.
- A multi-channel controller (MCC), including the transformer, motor starters, and variable frequency drive for EW-11 pump

AOP System Technology

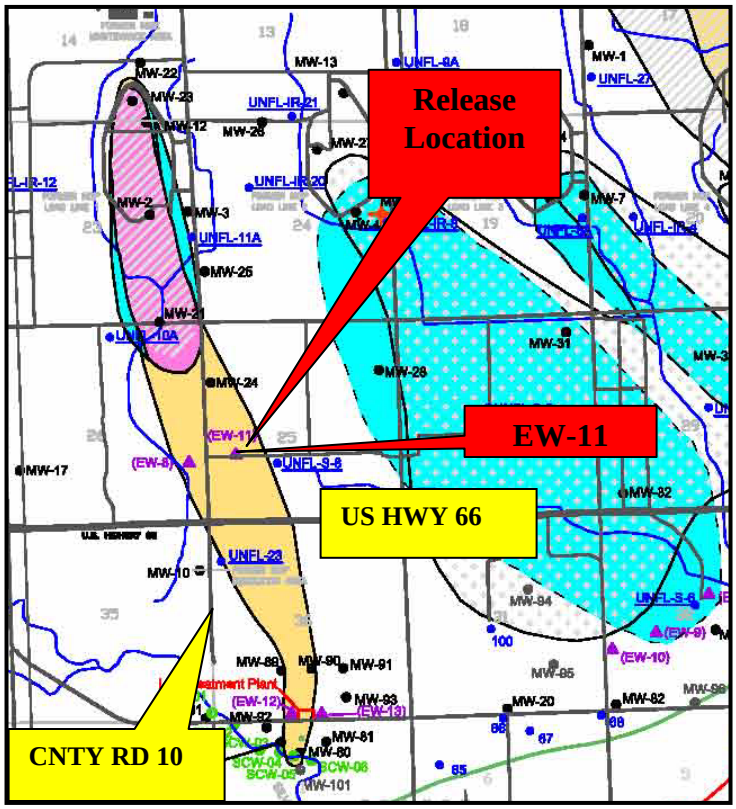
The innovative HiPOx system is designed to utilize hydroxyl radicals that are generated from a reaction between hydrogen peroxide and ozone (O_3), injected in precise quantities into the water stream. These hydroxyl radicals destroy and break TCE into byproducts such as carbon dioxide and water. Treated water from AOP system is then sent to the main treatment plant for final polishing with granular activated carbon (GAC).



HiPOx In-Line Continuous Flow Oxidation System

Groundwater Spill at AOP Plant

On February 7, 2008, approximately 1,500 to 2,000 gallons of contaminated groundwater were released from the Advanced Oxidation Process (AOP) pretreatment system when a release valve at the manhole junction malfunctioned. No chemicals from the AOP plant were released in the spill. The Army contractor followed established protocol and response procedures by notifying the Army, who in turn notified the Environmental Protection Agency (EPA) Region 7 and Nebraska Department of DEQ.



The Army determined through sampling of water in the pipeline from EW-11 that the TCE concentration in the release was approximately 7,000 parts per billion (ppb), equating to approximately 3 tablespoons of TCE. The release occurred over the plume footprint, in the vicinity of EW-11.

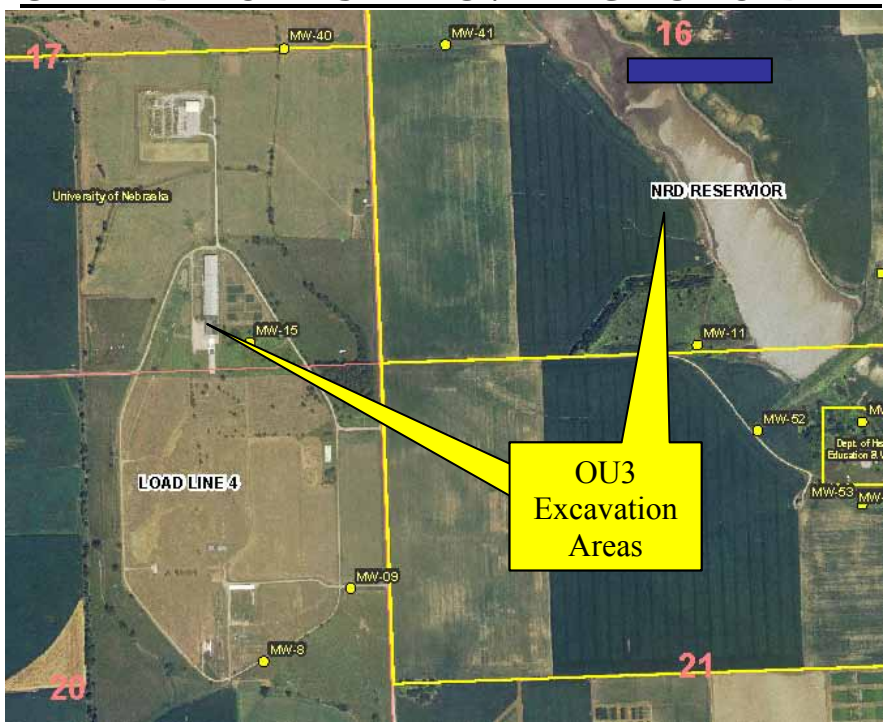
NDEQ determined that the amount and concentration of the spill was not a reportable quantity under NDEQ Title 126. The spill did not reach a surface water body; therefore, a violation of the National Pollutant Discharge Elimination System (NPDES) permit did not occur. The release also occurred over the top of an existing contaminated area and percolated back into the ground. Therefore no further action is required.

The malfunctioning valve that caused the spill, as well as other valves used in the treatment equipment across the site, were inspected and repaired as necessary to prevent potential future failures. Routine inspections will also be performed as part of standard operation and maintenance. Through remote monitoring of the entire system and routine physical inspections, this malfunction of this type is unlikely to occur again. If a system component fails, the extraction wells feeding that section of the pipeline would be immediately shut down until repairs are made.

AOP Facility Wide Safety

Facility-wide safety will involve protection from hazards associated with handling oxidants (hydrogen peroxide and ozone). Each of the constituents in the HiPOx process has associated dangers. Ozone is toxic, and an irritant to the skin, eyes, respiratory tract, and mucous membranes and can be a significant air pollutant. At the Mead AOP plant, the HiPOx process system will have ozone dosage of 8.9 milligrams per liter (mg/L). However, the ozone will be generated and directly injected into the pressure vessel with no handling required. The only ozone hazard would be from a leak of the system. Employees are protected from ozone hazards by routine air monitoring. Also, ozone has a distinctive "fruity" smell that would warn employees of a potential leak. Designated points of ozone "off-gassing" have ozone destruction devices to destroy ozone prior to discharge into the atmosphere. These off-gassing points will be monitored. Ozone monitoring will be ongoing within the treatment building and if an ozone leak is detected an alarm will sound and the HiPOx equipment will be shut down. In addition to this, alarms for high dew point in gas feed to ozone generator, high temperature, high inlet cooling water temperature, and insufficient gas flow to the generator will also provide system and plant shutdown if not acknowledged. Also, alarms for air preparation system failure and ozone monitor failure will provide system and plant shutdown if not acknowledged. For more details on AOP safety and system operation, a Fact Sheet is available on project website: (http://www.nwk.usace.army.mil/projects/mead/Site_Information_and_Background/Advanced_Oxidation_Process_Safety_Fact_Sheet.pdf)

OPERABLE UNIT 3 REMOVAL ACTION UPDATE



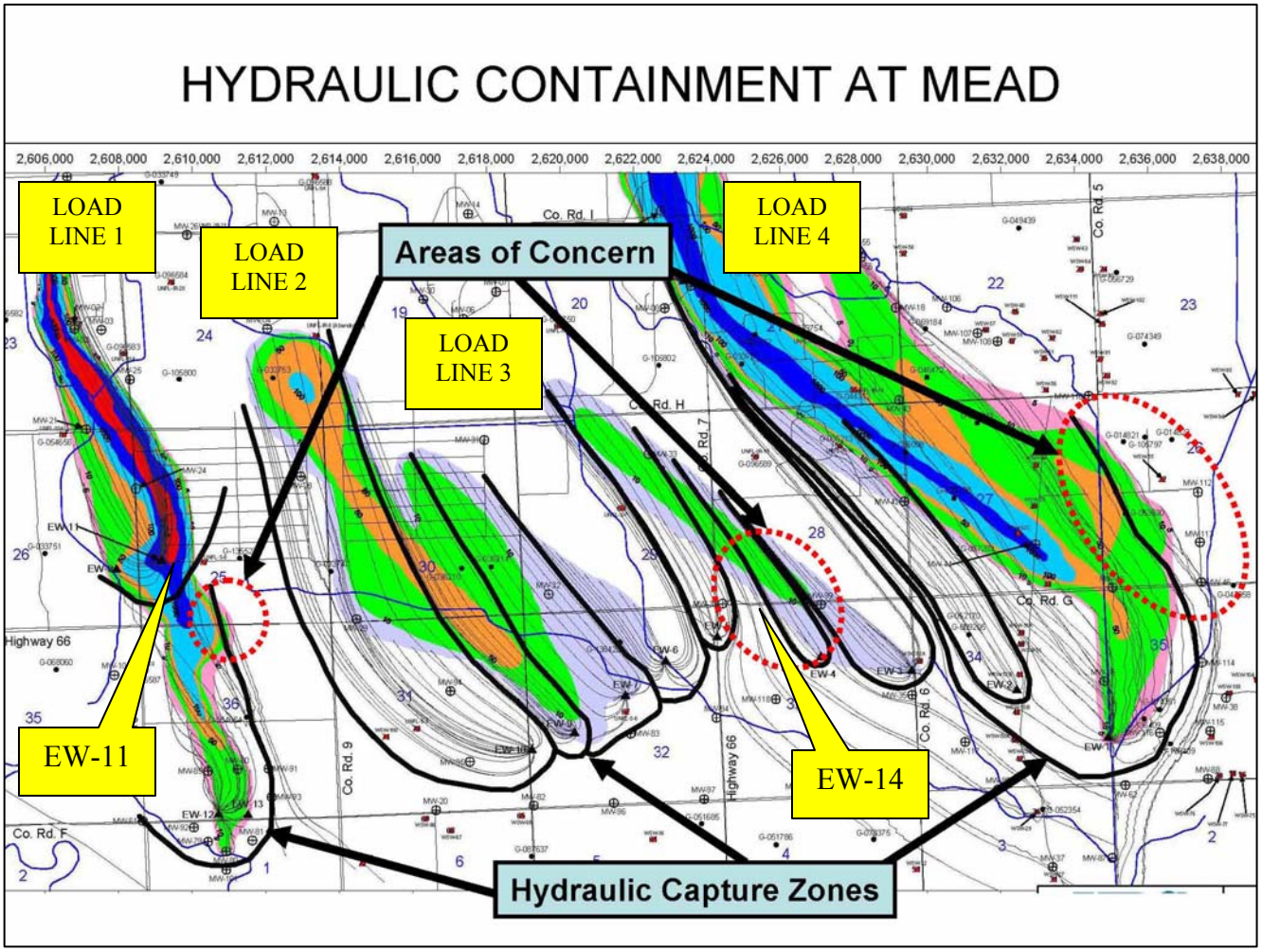
The cleanup action to remove 1,000 cubic yards of soil contaminated with antimony (a heavy metal associated with painting operations) is proceeding. Work plans are being completed with excavation to begin in April. The contaminated soil will be disposed in an offsite, regulator-approved landfill. For more information, visit the project web site or the Mead Public Library to read documents regarding the Operable Unit 3 cleanup.

NEW EXTRACTION WELL

The Army has begun activities to install a new extraction well to contain the Load Line 3 explosives groundwater plume. Extraction Well (EW) 14 should be fully operational by Fall 2008.

As reported in August 2007, groundwater modeling indicates that under the current containment well configuration, there are three areas where groundwater contamination is not fully hydraulically contained - in the Load Line 3 plume area, in the southeastern portion of the Atlas Missile Area plume (also known as Load Line 4), and in the Load Line 1 plume area. These plumes could bypass the extraction well network in 5-10 years if no actions are taken to improve containment.

To ensure hydraulic containment, the Army uses groundwater modeling to identify locations where additional extraction wells can be placed that will prevent contamination from moving beyond the current footprint. Containment options for the Load Lines 1 and 4 plumes are still under evaluation.



VISIT THE PROJECT WEB SITE

Please visit our project web page to find site background information, documents of public interest, maps, fact sheets, Restoration Advisory Board updates, and quarterly water sampling results. One of the newest features is an interactive spreadsheet that contains historic well sampling data for TCE and RDX in monitoring wells, water supply wells, and surface water. Users can choose a specific well or contaminant to find the data they need. The web page address is: http://www.nwk.usace.army.mil/projects/mead/projectindex.html.

For more information or any questions concerning the Mead project, please contact:

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Information repository documents are available for review at:

Mead Public Library
316 South Vine Street
Mead, Nebraska 68041
(402) 624-6605

Hours:
Monday, 2 PM -7 PM (2 PM - 8 PM June through August)
Thursday, 9:30 AM - 11:30 AM and 2 PM -7 PM (2 PM - 8 PM June through August)
Saturday, 9 AM to 12 Noon

The Mead Library also has a dedicated computer that has electronic versions of the documents in the Repository. Users are free to download documents onto their own electronic media (CDs or flash drive).