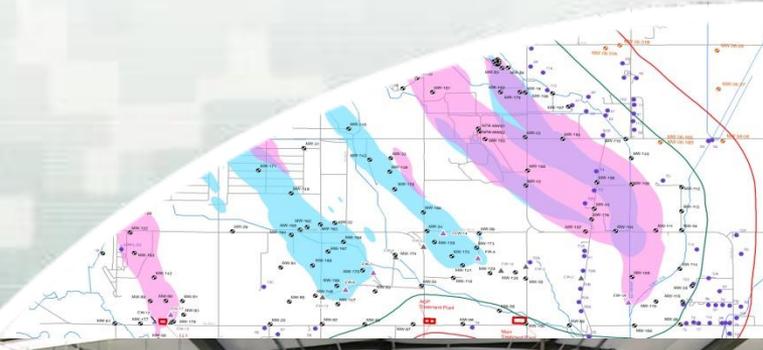


2012 Containment Evaluation



October 16, 2013



®

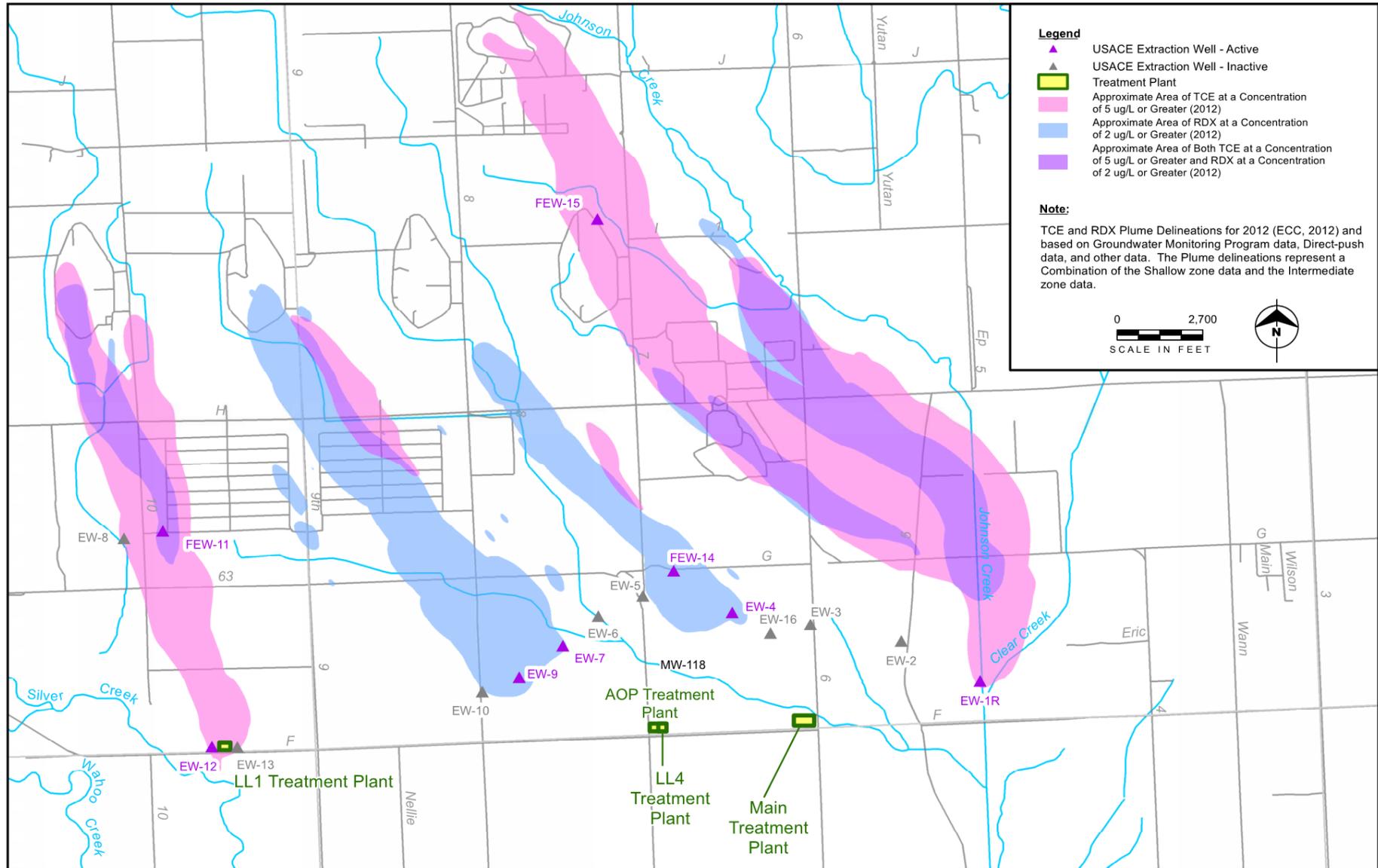
US Army Corps of Engineers
BUILDING STRONG®

The Containment Evaluation

- U.S. Army Corps of Engineers evaluates containment annually at the former Nebraska Ordnance Plant site.
- Determines if the hydraulic containment wells are capturing the Operable Unit 2 Record of Decision contaminants of concern in groundwater that are above the Final Target Groundwater Cleanup Goals.



Containment System



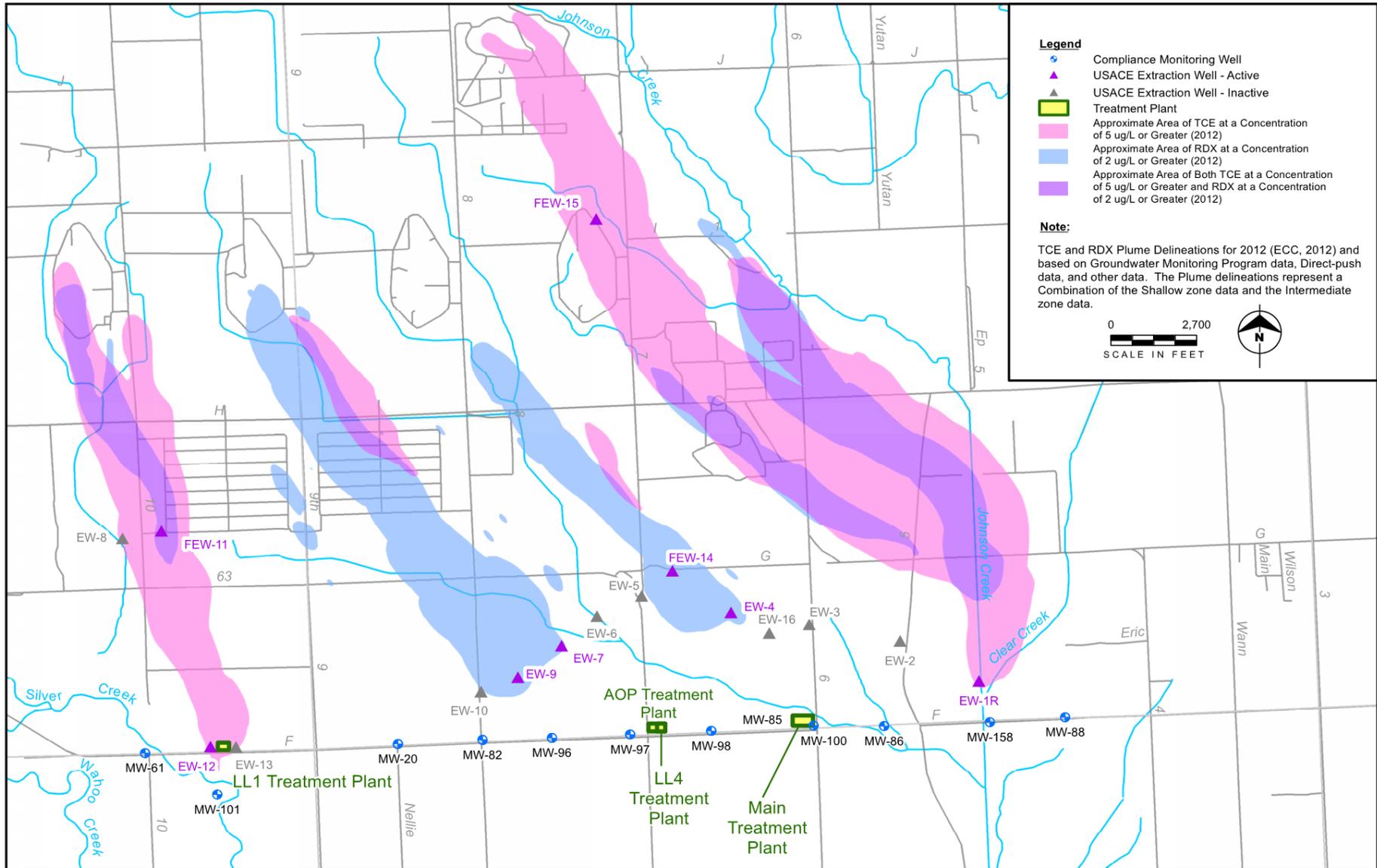
Evaluating Containment

Primary

- Containment is determined based on **chemical data** from downgradient compliance monitoring wells.
- If no contaminants of concern are **detected above the Final Target Groundwater Cleanup Goals** in compliance wells, containment is met.



Compliance Wells

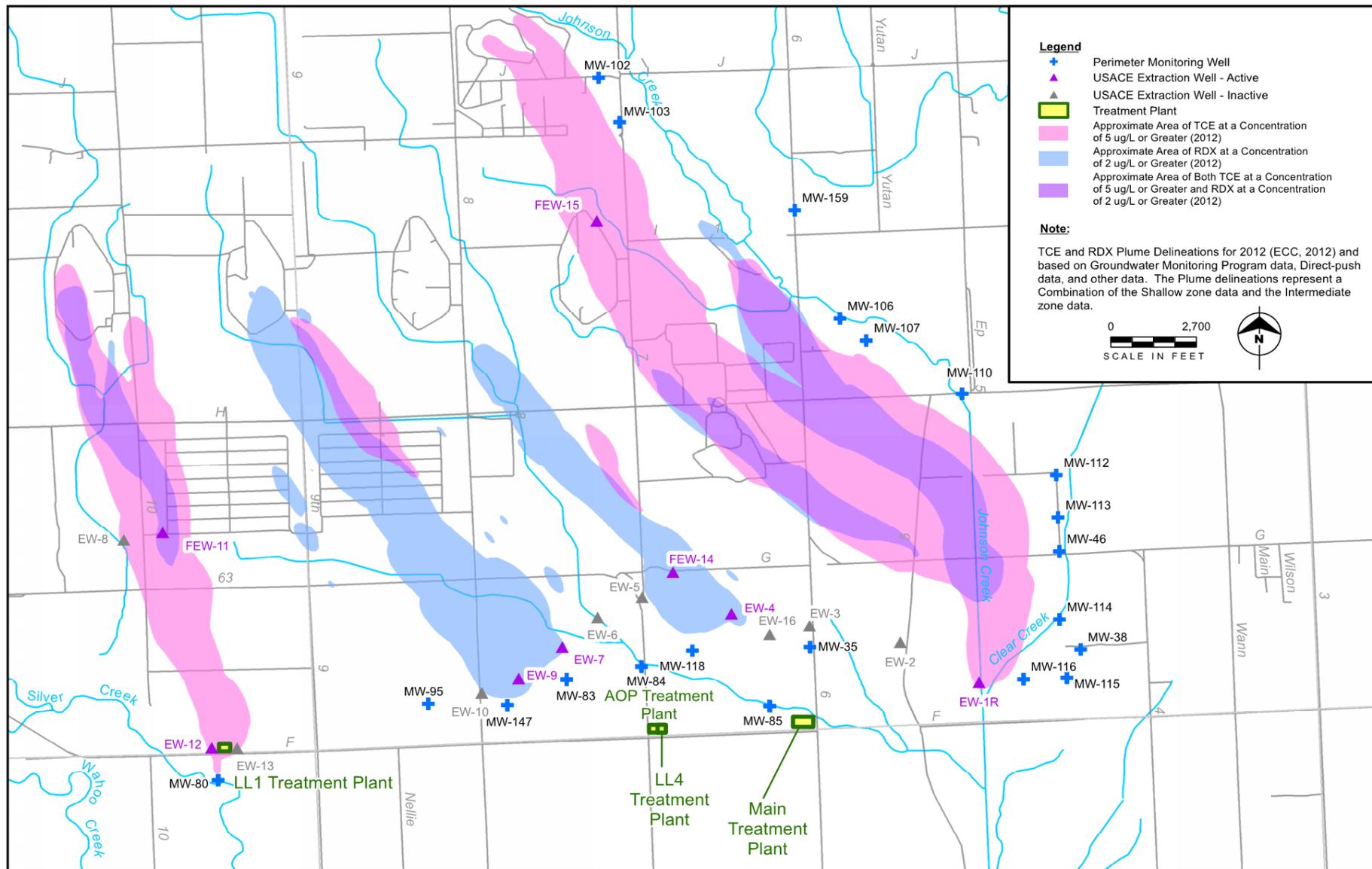


Evaluating Containment Secondary

- **Perimeter wells** are monitored at the perimeter of the plumes semi-annually
- **Groundwater transport modeling** is performed to evaluate general performance or effectiveness of the hydraulic containment system



Perimeter Wells

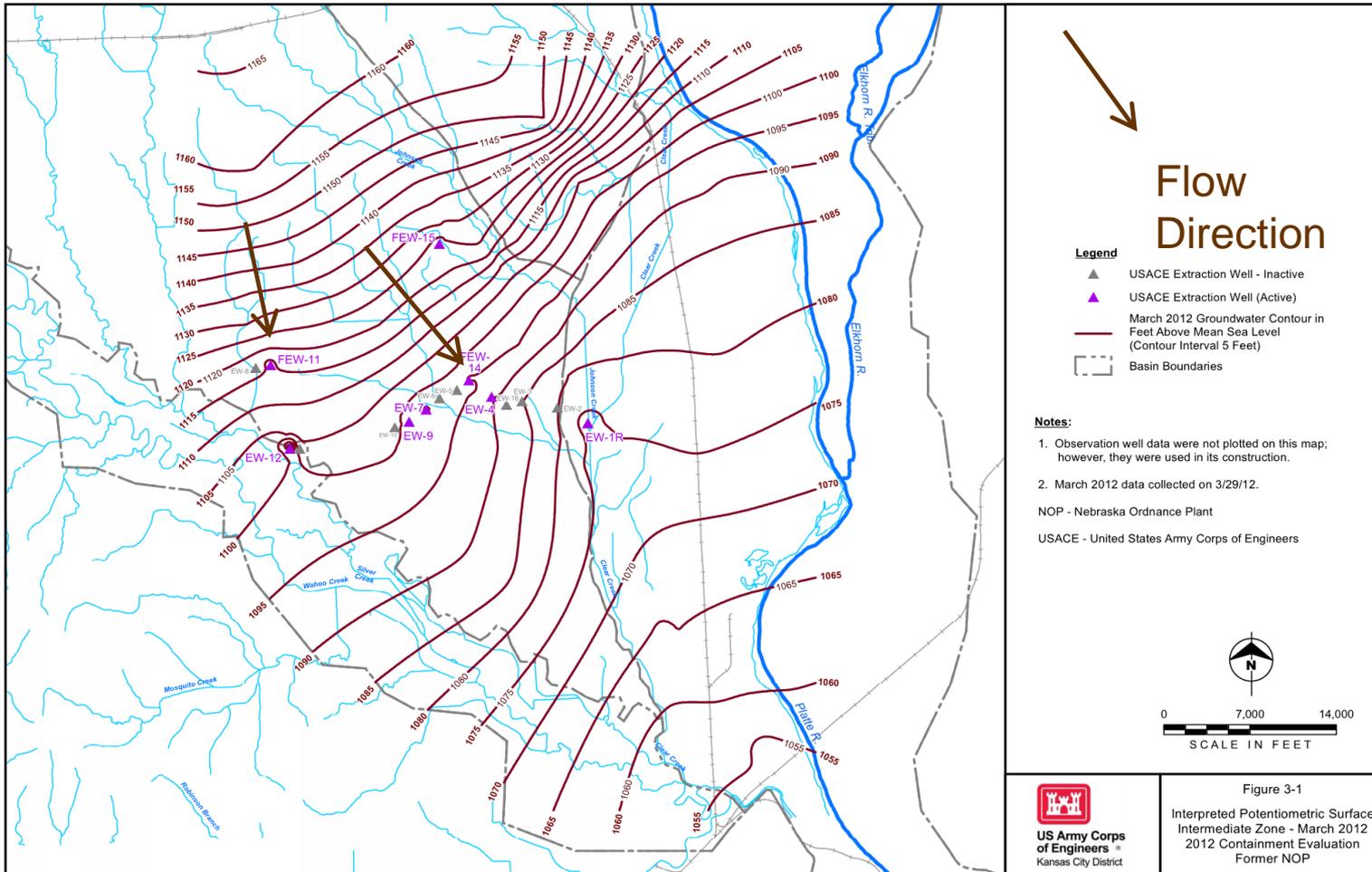


Evaluating 2012 Containment

- Information collected and evaluated:
 - ▶ **Water levels** –348 wells two times a year
 - ▶ **Groundwater samples** - from 33 Compliance and 71 Perimeter Wells
 - ▶ **Drinking Water samples** - from 72 Water Supply wells
 - ▶ **Pumping rates** - Extraction Wells, Metropolitan Utilities District, Lincoln Water System, the village of Mead, the city of Ashland and University of Nebraska-Lincoln Agricultural and Research Development Center.



2012 Groundwater Flow



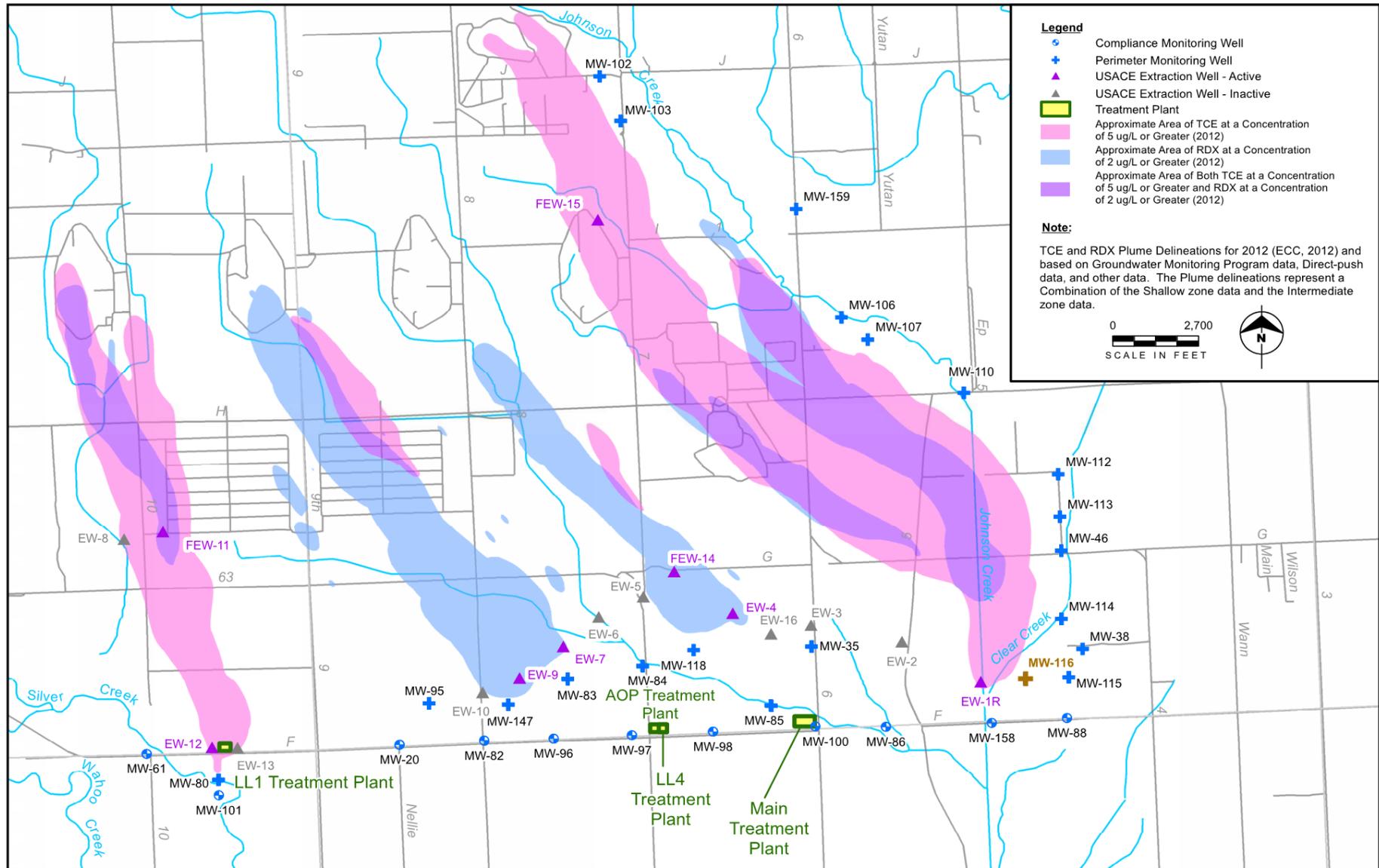
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US Army Corps of Engineers
Kansas City District



Perimeter Well – MW-116



Perimeter Well TCE Detection

- TCE was detected in MW-116A above Final Target Groundwater Cleanup Goals in one of the four sampling events
- TCE was below the detection limit in MW-116A in the subsequent sampling event
- 2011 studies indicated irrigation well operations may influence TCE plume in this area
- MW-116A is within the capture zone of EW-1R
- Continued collection of groundwater samples for laboratory analysis

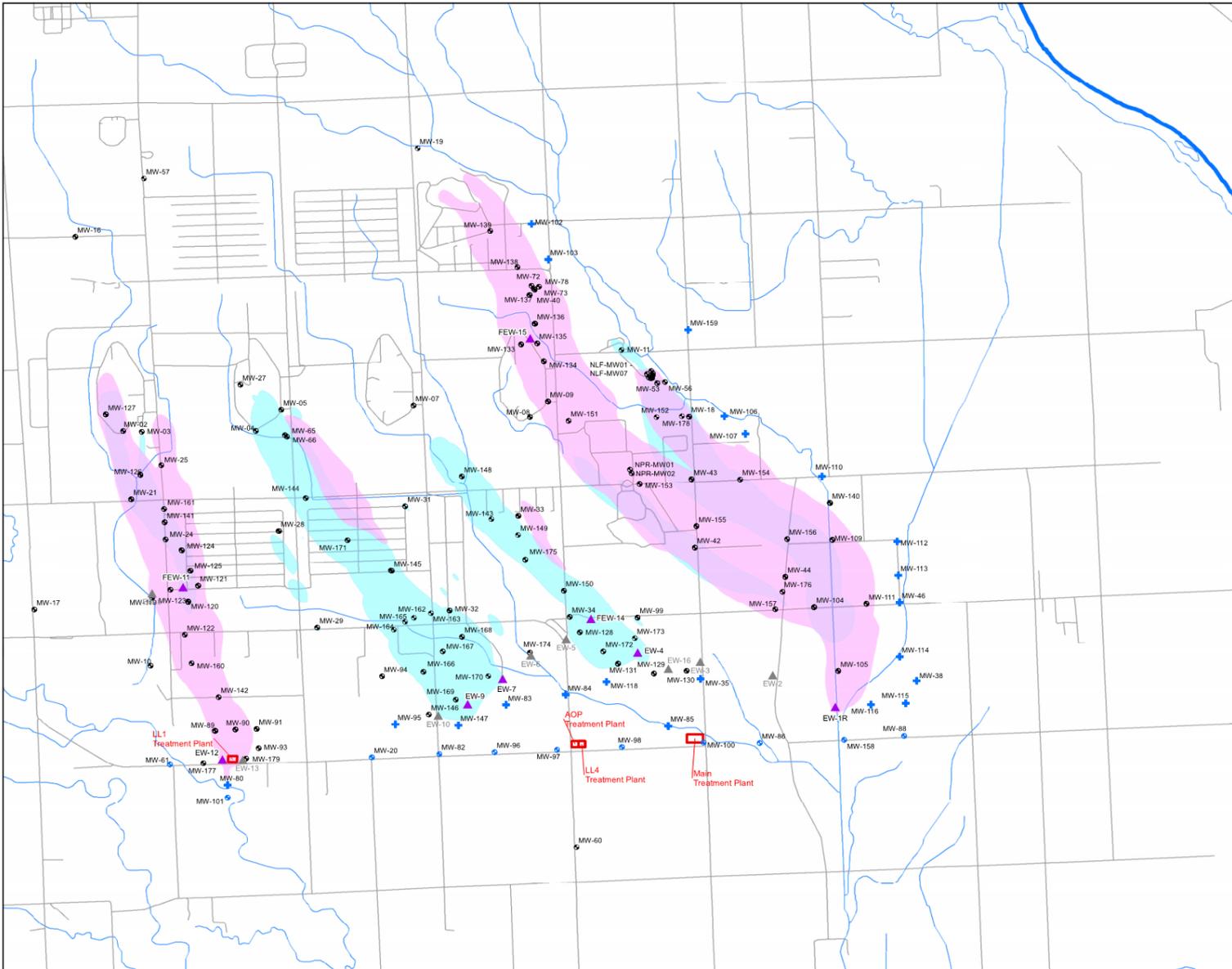


Annual Monitoring

- Groundwater data will continue to be collected during the annual Groundwater Monitoring Program
 - ▶ Water supply wells
 - ▶ Select monitoring wells
 - ▶ Compliance wells
 - ▶ Perimeter wells



Well Network



EXPLANATION

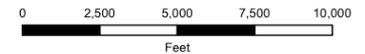
- Groundwater Monitoring Well/Well Cluster
- Compliance Monitoring Well
- Perimeter Monitoring Well
- Groundwater Extraction Well
- Groundwater Extraction Well (Inactive)
- Treatment Plant

Contaminant Plumes

- Approximate Area of TCE at a Concentration of 5 ug/L or Greater (2012)
- Approximate Area of RDX at a Concentration of 2 ug/L or Greater (2012)
- Approximate Area of Both TCE at a Concentration of 5 ug/L or Greater and RDX at a Concentration of 2 ug/L or Greater (2012)

NOTE:
TCE and RDX plume delineations are based on Groundwater Monitoring Program data, direct-push data, and other data. The plume delineations represent a combination of the shallow zone data and the intermediate zone data.

TCE - trichloroethene
RDX - hexahydro-1,3,5-trinitro-1,3,5-triazine
ug/L - micrograms per liter



Former Nebraska Ordnance Plant Overall Site Map

Drawn by: M. Johnson	Reviewed by: S. Carter	Notes and Sources:
Date: 9/9/2013	Date: 9/12/2013	Projection: North American Datum 1983
Version:	Revision Date / initials: 9/12/2013 JMF	Units: Feet

2012 Containment Evaluation Conclusion

- Containment has been achieved for 2012
 - ▶ No contaminants of concern were detected in any of the compliance wells above the Final Target Groundwater Cleanup Goals in 2012

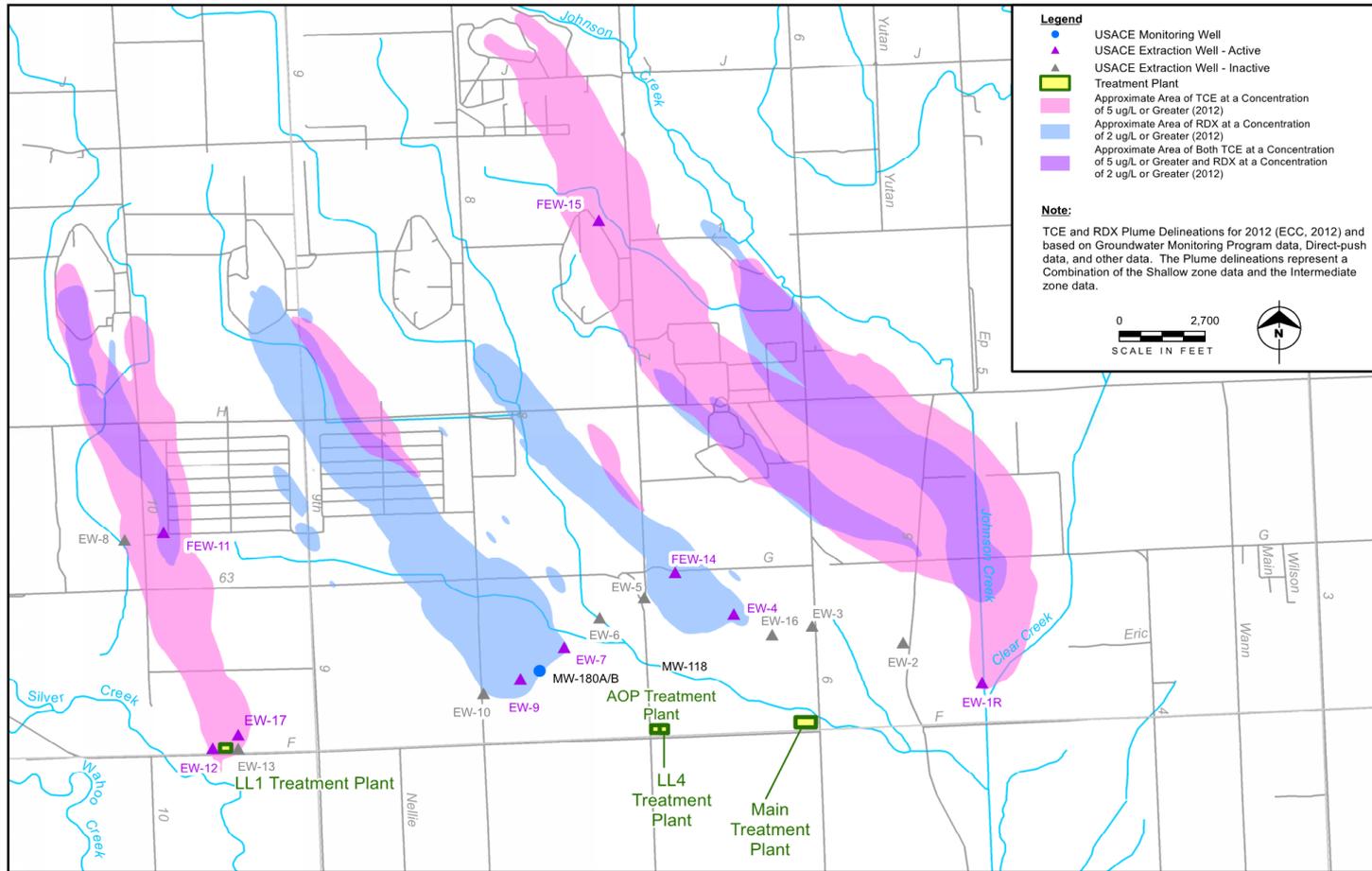


2013 Updates

- New Extraction Well (EW-17) installed at the Load Line 1 plume to provide additional containment.
- EW-13 was abandoned after the installation of EW-17.
 - ▶ EW-13 has not been operational and was never connected to the Load Line 1 Groundwater Treatment Plant due to the low pumping rates of less than 50 gallons per minute.
- New monitoring wells (MW-180A/B) were installed to further monitor the Load Line 2 RDX plume.



EW-17, EW-13 and MW-180 Locations



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Questions

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and our Posterity, do ordain
and establish this Con

