Remediation Cost Estimate Summary

Willow Run CVO
MLC ID 3064

October 30, 2009

Table of Contents

Background Information

The 28-acre Willow Run GM Company Vehicle Operations (CVO) property is located on the former Willow Run Assembly Plant in Ypsilanti, Michigan.

Prior to 1940, the Ford Motor Company owned a large section of undeveloped land including the site of the former Willow Run Plant. In 1941 the United States Defense Plant Corporation of America purchased the Willow Run property and contracted Ford to construct and operate a bomber production plant. The Kaiser-Frazer Company (Kaiser-Frazer) leased the bomber plant and former assembly plant property from the War Asset Administration in November 1945 and purchased the property in December 1948. Kaiser-Frazer owned the property until its sale to GM in December 1954.

After 1993, the portion of the property currently referred to as the Willow Run Business Center (WRBC) underwent deactivation activities and is presently used as a parts storage warehouse. In 1997, GM sold the WRBC portion of the Plant to Insite, LLC, but retained the CVO portion of the Plant for its ongoing operations.

The CVO which consists of 22 acres was used to process, store and maintain GM-owned vehicles. The majority of the property is paved or covered by structures. Both paved areas and building roofs are drained to the storm water sewer system, which flows into Tyler Pond through a series of outfalls. Surface water runoff from much of the surrounding area also flows to Willow Run Creek and Tyler Pond. Willow Run Creek originates north of the Willow Run Airport and flows through Tyler Pond west of the airport. The airport is located to the north and east of the Plant.

The Plant is bordered on the northeast and east by Tyler Pond, which influences groundwater flow at the property. The western and central portions of the property are occupied by the WRBC. The southeastern portion of the property is occupied by the CVO. Tyler Road abuts the southern property boundary.

The Plant has numerous robustly constructed subsurface structures that have made investigation and remediation of contaminants difficult to conduct. The slab beneath the buildings at CVO is several feet thick in a number of areas. There are also a number subsurface basements, vaults and bunkers.

Significant quantities of dense non-aqueous phase liquid (DNAPL) are present beneath the CVO portion of the property. The total quantity of DNAPL in the subsurface is unknown. Limited DNAPL recovery operations are ongoing at the Site to prevent migration of DNAPL into Tyler Pond.

Background information is provided below:

- Site Location

  2901 Tyler Road
  Ypsilanti, MI 48198
  Facility ID 3064

- EPA ID Numbers

  MDEQ MIK468293311

- MLC Project Manager

  Ken Richards

- Regulatory Agencies & Contacts

  Michigan Department of Environmental Quality (MDEQ); Vickie Katko

- Principal Consultant(s)

  CRA

- LFR ARCADIS Lead Site Analysts

  John McKenna

- Current Phase of Site

  Site in various phases by Potential Area of Concern (PAOC)

Real Estate Information

The following is a summary of the real estate information for the property:

- Current Land Use & Zoning/Permitted Use – Vacant/Paved Parking
- Zoning– Com Vacant Land
- Building & Improvements – Paved Parking Lot
- Size, age, condition – 9.3 Acres
- Infrastructure – Unknown
- Demo Cost (as nec. for remediation) – None

Environmental History

The environmental history of the property will be broken down by the individual Potential Areas of Concern which have been identified/

PAOC 18

Kaiser-Frazer dumped "paint sludge" in the area between the CVO fence line and Tyler Pond during the 1940's and 1950's. In February of 1994, an estimated 90 cubic yards of visible surface waste material, including 30 drum remnants was removed from this area. Waste and soils were removed until visually clean underlying soils were exposed.

In May 2004, the presence of dense nonaqueous phase liquid (DNAPL) was confirmed in monitoring wells MW18-01 and MW18-02. The DNAPL contains high levels of TCE and PCBs and has been classified as a TSCA and RCRA hazardous waste. DNAPL recovery by bailer or pumping was initiated in August 2004. In October and November 2004, a sheet pile wall barrier was installed to ensure that DNAPL did not migrate into Tyler Pond as an interim response action. DNAPL removal continues behind the sheet pile wall. Approximately 882 gallons of DNAPL was removed between August 2004 and April 2007. Light nonaqueous phase liquid (LNAPL) has also been observed in two wells in PAOC 18 but does not appear to be widespread.

Investigations completed in 2004 and 2005 have identified that a significant amount of buried debris is present in PAOC 18. Test pits conducted in September 2004 revealed several buried drums first identified through an electromagnetic survey. Other debris observed during soil boring and test-pitting activities (2004 and 2005) include wood, concrete, plastic, metal and solidified paint sludge.

Soil borings, including the use of membrane interface probe (MIP) technology were completed along the bank to define the extent of DNAPL. In February 2007 further delineation of the DNAPL pool resulted in the installation of two more recovery wells.

Recent developments include the presence of TCE, cis-1,2-dichloroethene and vinyl chloride in groundwater at one of the GSI compliance points, GS-8. It is believed that the groundwater is starting to migrate around the sheet piling, resulting in the transportation of these constituents into Tyler Pond at concentrations that exceed the Final Acute Value (FAV) Criterion.

A short term remedial strategy of Emulsified Oil Substrate (EOS^{TM}) injections to enhance the in-situ anaerobic bioremediation of the chlorinated solvents was approved by the MDEQ and implemented April 23, 2007. The constituent concentrations are currently being monitored every quarter in accordance with the injection work plan approved by the MDEQ.

Long term remedial strategies have been submitted to MDEQ for review.

PAOC 19

Volatile organic compounds (VOCs) were detected in soil and groundwater during a Phase I Hydrogeologic Investigation in September 1994. VOC compounds have never been stored in the tanks near this area.

CRA completed several chemical oxidation injections between 2001 and 2003 to treat two VOC hot spots on the property. Due to the presence of LNAPL in Area 1 and DNAPL in Area 2, the chemical oxidant injections were not successful in decreasing the concentrations of VOCs to levels that would support natural attenuation.

A groundwater/surface water interface (GSI) well was installed south of the Tyler Pond dam, east of the Fons landfill to evaluate the groundwater concentrations along the southern portion of the Site. Another GSI well was installed in May 2005 on the west side of the sheet pile wall.

Approximately eight steel drums containing product, sludge, black tar, or soils were found during the test pitting activities conducted in June 2005. The refuse observed in the test pits included stained soils, solidified paint sludge, ash, plastic, concrete, glass, and wood debris.

Constituent concentrations were detected above the MDEQ Part 201 generic cleanup criteria and a revised notice of migration (NOM) was submitted to the MDEQ in early 2007.

Field activities were completed to delineate the suspected preferential pathway boundaries between the Haulaway Building and the southeastern property boundary. During the investigation, evidence of potential non-aqueous phase liquid (NAPL) was identified in the some of the borings and was subsequently delineated.

PAOC 20/24

PAOC 20 consisted of a former UST farm located west of the Haulaway Building. The USTs were removed historically and the MDEQ accepted closure of this area in 2001.

PAOC 24 was identified following the observation of two pits in a 1952 aerial photograph that appeared to be filled with liquids. PAOC 24 is located in the same area as PAOC 20. Soil analytical results revealed fuel-type impacts in the area. No further work is required in these areas.

PAOC 23

PAOC 23 located east of the Haulaway Building where groundwater impacts have been identified. Investigations in 2005 identified several buried drums, which contained oil sludges and oily water. LNAPL with elevated PCBs have been identified in a well located adjacent to the test pits where the drums were located.

Soil gas samples were collected in May 2005 to evaluate the potential for migration of vapors to indoor air. Site-specific soil gas criteria were developed for the constituents

which exceeded the MDEQ soil gas screening concentrations. Two constituents exceeded the Site-specific soil gas criteria. Based on review of the indoor air sampling by a GM industrial hygienist, no further work was required as the results were below OSHA limits.

PAOC 29

A new PAOC, PAOC 29 was created to separate issues on the bank of Tyler pond west of PAOC 18. PAOCs 22 and 21 have been folded into this new PAOC. Investigations in 2005 identified a significant amount of buried debris in PAOC 29. The debris included several drums, wood, concrete, plastic, metal, sludge, black tar, and solidified paint sludge.

Current Environmental Issues and Future Remedial Actions

Current environmental issues and future remedial actions are outlined below:

PAOC 18

PAOC 18 is essentially in an Interim Removal Action (IRA) phase. DNAPL continues to be recovered from behind the sheet pile wall installed in 2004 to prevent continued migration of DNAPL toward Tyler Pond. All recovered DNAPL is sent to Texas for destruction in a TSCA-permitted incinerator based on the presence of TCE (40%) and PCBs (1.5%) in the DNAPL.

Recent developments include the presence of TCE, cis-1,2-dichloroethene and vinyl chloride at one of the GSI compliance points, GS-8. It is believed that the groundwater is starting to migrate around the sheet piling transporting these constituents into Tyler Pond at concentrations that exceed the Final Acute Value (FAV) Criterion.

Based on these developments, MDEQ is likely to require extension of the sheet wall to preclude contaminated groundwater and DNAPL migration into Tyler Pond. MDEQ may agree to accept continued DNAPL extraction at the current rate using the existing system. However, it is more likely that MDEQ will require more aggressive DNAPL recovery with a more robust recovery system. MDEQ is likely to require an ecological study of Tyler Pond, Willow Run Creek and downstream water bodies. Alternatively, MDEQ may require that soils contaminated with DNAPL be excavated and transported for thermal destruction at a TSCA-permitted incinerator.

PAOC 19

PAOC 19 is essentially a proxy for site-wide groundwater and currently is in the investigation phase. Compounds of concern include VOCs, SVOCs and LNAPL. In 2007, a Notice of Migration (NOM) for PAOC 19 was filed with MDEQ. Groundwater monitoring is ongoing and continuing with respect to this PAOC.

MDEQ is expected to require LNAPL/DNAPL recovery. The agency may allow Monitoring Natural Attenuation (MNA) of dissolved phase constituents. However, it is likely that MDEQ will require LNAPL/DNAPL recovery with groundwater treatment for several years followed by MNA. Alternatively, MDEQ may require the installation of a barrier wall containment system to mitigate migration of LNAPL/DNAPL and contaminated groundwater to Tyler Pond. Groundwater extraction and LNAPL/DNAPL recovery could continue for up to 30 years after installation of the barrier wall.

PAOC 24

PAOC 24 currently is in the investigation phase. Fuel-type contaminants have been found in soils at this location. It is anticipated that MDEQ will not require additional work at this location. However, it is likely that MDEQ will require an IRA to provide in-situ enhanced biodegradation of soil contaminants. Alternatively, MDEQ could require the excavation and disposal of impacted soils followed by limited groundwater treatment.

PAOC 23

PAOC 23 is in the In–situ Reactive Zone (IRZ) phase. Soil gas emissions are a potential indoor air contaminant and exposure concern at this location. Indoor air VOCs are reportedly above OSHA standards in portions of the building at PAOC 23.

VOCs and SVOCs are the primary contaminants of concern.

Remediation Cost Estimate

The remedial cost estimate is provided below:

Remedial Activities

- Conduct additional investigations to better define the extent of the DNAPL/LNAPL plume and overall site conditions;
- Extend the barrier wall immediately south of Tyler Pond;
- Implement more aggressive LNAPL/DNAPL and groundwater recovery;
- Implement IRZ at PAOCs 23 and 24;
- Attempt to bundle together remedial actions for multiple PAOCs.
- Implement groundwater monitoring program.

Regulatory Drivers

MDEQ currently is the lead agency for remedial activities associated with the property. There is no formal agreement with MDEQ or other agency regarding the investigation and remediation of the property. Investigation and remediation work is being completed on a voluntary basis.

Key Assumptions

A comprehensive investigation is completed and remedial actions are accepted by the MDEQ.

Other Key Issues

It is believed that a significant portion of the liability for environmental issues at this Plant can be demonstrated to belong to other parties, including the US Government. Prior to 1940, the Ford Motor Company owned a large section of undeveloped land including the site of the former Willow Run Plant. In 1941 the United States Defense Plant Corporation of America purchased the Willow Run Plant and contracted Ford to construct and operate a bomber production plant. The Kaiser-Frazer Company leased the bomber plant and former assembly plant property from the War Asset Administration in November 1945 and purchased the property in December 1948. Kaiser-Frazer owned the property until its sale to GM in December 1954.

No formal identification of PRPs or allocation of liabilities amongst such PRPs has occurred to date.

The remediation cost estimate for this site in current dollars (2009) is $7,936,500. Refer to the Remediation Budget Summary Spreadsheet below for more details.

Remediation Cost Estimate Summary

Year	No.	PAOC 18/29 - DNAPL/LNAPL	Contingency	PAOC 19 (Site Wide GW)	Contingency	PAOC 23	Contingency	PACO 24	Contingency	Agreements/Work Plans/Risk Assessment/Reports	Contingency
2009	1	$ -	10%	$ -	10%	$ -	10%	$ -	10%	$ -	10%
2010	2	$ -	10%	$ -	10%	$ -	10%	$ -	10%	$ 250,000	10%
2011	3	$ 900,000	10%	$ 2,500,000	10%	$ 300,000	10%	$ 300,000	10%	$ 300,000	10%
2012	4	$ 90,000	10%	$ 100,000	10%	$ 15,000	10%	$ 25,000	10%	$ 150,000	10%
2013	5	$ 90,000	10%	$ 100,000	10%	$ 15,000	10%	$ 25,000	10%	$ -	10%
2014	6	$ 90,000	10%	$ 100,000	10%	$ 15,000	10%	$ 25,000	10%	$ -	10%
2015	7	$ 90,000	10%	$ 100,000	10%	$ 15,000	10%	$ 25,000	10%	$ -	10%
2016	8	$ 90,000	10%	$ 100,000	10%	$ 15,000	10%	$ 25,000	10%	$ -	10%
2017	9	$ -	10%	$ 100,000	10%	$ -	10%	$ -	10%	$ -	10%
2018	10	$ -	10%	$ 100,000	10%	$ -	10%	$ -	10%	$ -	10%
2019	11	$ -	10%	$ 100,000	10%	$ -	10%	$ -	10%	$ -	10%
2020	12	$ -	10%	$ 100,000	10%	$ -	10%	$ -	10%	$ -	10%
2021	13	$ -	10%	$ 100,000	10%	$ -	10%	$ -	10%	$ -	10%
2022	14	$ -	10%	$ 100,000	10%	$ -	10%	$ -	10%	$ -	10%
2023	15	$ -	10%	$ 75,000	10%	$ -	10%	$ -	10%	$ -	10%
2024	16	$ -	10%	$ 75,000	10%	$ -	10%	$ -	10%	$ -	10%
2025	17	$ -	10%	$ 75,000	10%	$ -	10%	$ -	10%	$ -	10%
2026	18	$ -	10%	$ 75,000	10%	$ -	10%	$ -	10%	$ -	10%
2027	19	$ -	10%	$ 75,000	10%	$ -	10%	$ -	10%	$ -	10%
2028	20	$ -	10%	$ 75,000	10%	$ -	10%	$ -	10%	$ -	10%
2029	21	$ -	10%	$ 75,000	10%	$ -	10%	$ -	10%	$ -	10%
2030	22	$ -	10%	$ 75,000	10%	$ -	10%	$ -	10%	$ -	10%
2031	23	$ -	10%	$ 75,000	10%	$ -	10%	$ -	10%	$ -	10%
2032	24	$ -	10%	$ 90,000	10%	$ -	10%	$ -	10%	$ -	10%
2033	25	$ -	10%	$ -	10%	$ -	10%	$ -	10%	$ -	10%
2034	26	$ -	10%	$ -	10%	$ -	10%	$ -	10%	$ -	10%
2035	27	$ -	10%	$ -	10%	$ -	10%	$ -	10%	$ -	10%
2036	28	$ -	10%	$ -	10%	$ -	10%	$ -	10%	$ -	10%
2037	29	$ -	10%	$ -	10%	$ -	10%	$ -	10%	$ -	10%
2038	30	$ -	10%	$ -	10%	$ -	10%	$ -	10%	$ -	10%