

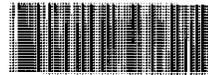
**FIVE-YEAR REVIEW REPORT FOR  
F. O'CONNOR COMPANY SUPERFUND SITE  
KENNEBEC COUNTY, MAINE**

Superfund Records Center  
Site: O'Connor Site  
BRIEF: 8.3  
OTHER: 522180



Prepared by

U.S. Environmental Protection Agency  
Region 1  
Boston, Massachusetts



SDMS DocID 522180

Nancy Barmakian for  
James T. Owens, III Office Director

09/26/12  
Date

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## LIST OF ABBREVIATIONS

AOC	Administrative Order by Consent
ARAR	Applicable or Relevant and Appropriate Requirement
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CMP	Central Maine Power Company
cPAHs	carcinogenic polyaromatic hydrocarbons
CSF	Cancer Slope Factor
ESD	Explanation of Significant Differences
HA	health advisory
MCL	Maximum Contaminant Level
MEDEP	Maine Department of Environmental Protection
MEGs	Maximum Exposure Guidelines
MOM	Management of Migration
MRSA	Maine Revised Statutes Annotated
NCP	National Contingency Plan
ND	non detect
NPL	National Priorities List
OU	Operable Unit
O&M	Operations and Maintenance
PCBs	Polychlorinated biphenyls
ppb	parts per billion
ppm	parts per million
PRP	Potentially Responsible Party
RfDs	USEPA Risk Reference Doses
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RSOW	Remedial Design/Remedial action Revised Statement of Work
SC	source control
SCRA	Source Control Remedial Action
SDWA	Safe Drinking Water Act
Site	O'Connor Company Superfund Site
TI	Technical Impracticability
TSCA	Toxic Substances Control Act
TWA	Transformer Work Area
µg/L	micrograms per liter
USEPA	United States Environmental Protection Agency
VER	vacuum enhanced recovery
VOC	volatile organic compound

## EXECUTIVE SUMMARY

This is the third five-year review performed for the F. O'Connor Superfund Site (Site) in Augusta, Maine. Five-year reviews are required by CERCLA when hazardous substances are left onsite such that restrictions are placed on the use of the site. The purpose of the five-year review is to assess whether the remedy selected for the Site remains protective of human health and the environment. The trigger for this five-year review is the completion of the second five-year review in September 2007.

The 1989 Record of Decision (ROD) selected a remedy to address the risks present in the Site soils and groundwater from PCBs, PAHs, lead, and VOCs. These risks resulted from the operation of a salvage and electrical transformer recycling business. The 1989 remedy has subsequently been modified by an Explanation of Significant Differences (ESD) in 1994, a Contingency Remedy in 1995, and a ROD Amendment in 2002. The Site consists of three operable units (OUs).

The original Source Control (OU-1) remedy included on-site solvent extraction treatment of soils to specified cleanup levels and off-site disposal of soils and sediments that exceeded the target cleanup levels. The 1994 ESD adjusted the soil target cleanup level for soil located more than 12 inches below grade within a small area of the Site (Designated Area or DA). In 1995, a contingency in the 1994 ESD was triggered. The contingency waived the on-site treatment requirement, allowing for off-site disposal of all soil and sediment exceeding the target cleanup levels. The Source Control remedial action was completed on November 11, 1997.

The original Management of Migration (OU-2) remedy included groundwater extraction and treatment and recharge into the subsurface to specified cleanup levels and included temporary institutional controls to be put in place until the groundwater met cleanup levels. The 2002 ROD Amendment changed the OU-2 remedy with a Technical Impracticability (TI) determination that waived the cleanup standards for a limited area of the Site, replaced the groundwater extraction system with active and passive recovery of the PCB transformer oil, and made permanent the temporary institutional controls. Vacuum-enhanced recovery of the transformer oil from the Transformer Work Area (TWA) II occurred in 2002, 2003, 2004, and 2006 to remove transformer oil from groundwater monitoring wells. This active recovery was discontinued in 2006 as the amount recovered decreased to levels that could be recovered passively. The temporary institutional controls were made permanent on September 13, 2002 with the recording of a Declaration of Restrictive Covenant in the Kennebec County Registry of Deeds. Monitoring of groundwater continues and cleanup levels for VOCs have been met outside the TI Zone since Spring 2002, and cleanup levels for PCBs have been met outside the TI Zone since Spring 2006.

The 1989 ROD also addressed sediment in Riggs Brook (OU-3). The Riggs Brook remedy included ten years of annual monitoring of sediment and periodic biota sampling. The annual sediment monitoring was completed in 2005. Over 95% of the sediment samples were below the PCB trigger level of 5 ppm and the annual mean varied between 0.38 to 1.93 ppm (three years greater than 1 ppm, seven years 1 ppm or less). The two biota results were below the target level. In 2008, a 10' by 10' by 6" area centered on the one sediment location with the majority of exceedances was excavated.

The five-year review process revealed that the remedies for all three operable units have been implemented in accordance with the requirements of the ROD, as modified by the subsequent decision documents.

### Five-Year Review Summary Form

#### SITE IDENTIFICATION

**Site Name:** F O'Connor Company Superfund Site

**EPA ID:** MED980731475

**Region:** 1

**State:** ME

**City/County:** Augusta/Kennebec County

#### SITE STATUS

**NPL Status:** Final

**Multiple OUs?**

Yes

**Has the site achieved construction completion?**

Yes

#### REVIEW STATUS

**Lead agency:** EPA

If "Other Federal Agency" was selected above, enter Agency name: [Click here to enter text.](#)

**Author name (Federal or State Project Manager):** Terrence Connelly

**Author affiliation:** Region 1

**Review period:** February 15, 2012 – September 28, 2012

**Date of site inspection:** April 26, 2012

**Type of review:** Statutory

**Review number:** 3

**Triggering action date:** September 21, 2007

**Due date (five years after triggering action date):** September 21, 2012

**Five-Year Review Summary Form (continued)**

**Issues/Recommendations**

**OU(s) without Issues/Recommendations Identified in the Five-Year Review:**  
**No issues were identified in any of the operable units and no recommendations relative to the protectiveness of the remedies were made.**

**Issues and Recommendations Identified in the Five-Year Review:**

<b>OU(s): 1</b>	<b>Issue Category: No Issue</b>			
	<b>Issue:</b>			
	<b>Recommendation: Click here to enter text.</b>			
<b>Affect Current Protectiveness</b>	<b>Affect Future Protectiveness</b>	<b>Implementing Party</b>	<b>Oversight Party</b>	<b>Milestone Date</b>
No	No	EPA/State	EPA	
<b>OU(s): 2</b>	<b>Issue Category: No Issue</b>			
	<b>Issue:</b>			
	<b>Recommendation: Click here to enter text.</b>			
<b>Affect Current Protectiveness</b>	<b>Affect Future Protectiveness</b>	<b>Implementing Party</b>	<b>Oversight Party</b>	<b>Milestone Date</b>
No	No	EPA/State	EPA	
<b>OU(s): 3</b>	<b>Issue Category: No Issue</b>			
	<b>Issue:</b>			
	<b>Recommendation: Click here to enter text.</b>			
<b>Affect Current Protectiveness</b>	<b>Affect Future Protectiveness</b>	<b>Implementing Party</b>	<b>Oversight Party</b>	<b>Milestone Date</b>
No	No	EPA/State	EPA	

**Protectiveness Statement(s)**

<i>Operable Unit:</i> OU-1	<i>Protectiveness Determination:</i>	<i>Addendum Due Date (if applicable):</i>
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Protective	<a href="#">Click here to enter date.</a>
<p><b><i>Protectiveness Statement:</i></b>  The remedial action for OU-1 has been completed and is protective of human health and the environment. Exposure pathways that could result in unacceptable risk are being controlled through a clean soil cap that covers remaining contamination and institutional controls that have been placed on the Site. The O&amp;M plan was updated and approved in 2009 and its implementation will ensure that the OU-1 remedy remains protective.</p>	

<p><b><i>Operable Unit:</i></b> OU-2</p>	<p><b><i>Protectiveness Determination:</i></b> Protective</p>	<p><b><i>Addendum Due Date (if applicable):</i></b> <a href="#">Click here to enter date.</a></p>
<p><b><i>Protectiveness Statement:</i></b>  The remedy for OU-2 is protective of human health and the environment. Exposure pathways that could result in unacceptable risk are being controlled with institutional controls covering the entire Site. Outside the TI Zone, groundwater has met the performance standards for VOCs since Spring 2002 and since Spring 2006 for PCBs. Long-term monitoring will continue to ensure that the performance standards continue to be met.</p>		

<p><b><i>Operable Unit:</i></b> OU-3</p>	<p><b><i>Protectiveness Determination:</i></b> Protective</p>	<p><b><i>Addendum Due Date (if applicable):</i></b> <a href="#">Click here to enter date.</a></p>
<p><b><i>Protectiveness Statement:</i></b>  The remedy at OU-3 is protective of human health and the environment. Annual sampling of sediments for ten years has resulted in over 95% of the samples being below the trigger level with the annual mean PCB concentration varying between 0.38 and 1.72 ppm. Results from the two biota sampling events were below the threshold level of 2 ppm for all samples, with the overall average being below 1 ppm. Site inspections have documented functioning habitat in both the uplands and wetlands.</p>		

<p><b><i>Operable Unit:</i></b> Site-wide</p>	<p><b><i>Protectiveness Determination:</i></b> Protective</p>	<p><b><i>Addendum Due Date (if applicable):</i></b> <a href="#">Click here to enter date.</a></p>
<p><b><i>Protectiveness Statement:</i></b>  Because the remedial actions at all OUs are protective, the Site is protective of human health and the environment.</p>		

## 1.0 INTRODUCTION

This is the third five-year review for the F. O'Connor Company Superfund Site (Site) in Augusta, Maine. The purpose of this five-year review is to determine if the selected remedy is protective of human health and the environment. This report summarizes the five-year review process, investigations and remedial actions undertaken at the Site; evaluates the monitoring data collected; reviews the Applicable or Relevant and Appropriate Requirements (ARARs) specified in the decision documents for changes; discusses any issues identified during the review; and presents recommendations to address these issues. The decision documents include a 1989 Record of Decision (ROD), 1994 Explanation of Significant Differences (ESD), 1995 Contingency Remedy, and a 2002 ROD Amendment.

The United States Environmental Protection Agency, Region 1 (EPA) prepared this five-year review pursuant to the Section 121 of the Comprehensive Environmental Response Compensation, and Liability Act (CERCLA) and the National Contingency Plan. CERCLA § 121 states:

If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.

Under the regulations promulgated to implement these requirements, 40 CFR § 300.430(f)(4)(ii) of the National Contingency Plan states:

If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.

This statutory five-year review is required since hazardous substances remain at the Site above levels that allow for unlimited use and unrestricted exposure. The triggering action for the initial statutory review was initiation of the remedial action following remedial design. EPA conducted this five-year review of the remedial actions implemented at the O'Connor Site. Work on this review was performed between April and September 2012. Assistance was provided by the Maine Department of Environmental Protection (MEDEP), Central Maine Power Co. (CMP) and Woodard & Curran, Inc., consultants working for CMP. As referenced in the 1991 Consent Decree, CMP participated in the five-year review process. The review was completed in accordance with EPA Guidance OSWER No. 9355.7-03B-P.

## 2.0 SITE CHRONOLOGY

**Table 2-1: Chronology of Site Events**

DATE	EVENT
Early 1950s	F. O'Connor Co. begins operating a salvage and electrical transformer recycling business on the Site
Feb 1972	Onsite oil spill found to have migrated toward Riggs Brook
1978 & 1982	MEDEP conducts additional sampling events at the site, identifies polychlorinated biphenyl (PCB) contamination
1982-1984	EPA conducts sampling events at the Site, confirms PCB contamination
Sept 8, 1983	Site placed on National Priorities List (NPL)
Dec 21, 1984	EPA issues Unilateral Administrative Order to O'Connor Co. requiring it to fence five acres of the Site and sample and analyze all drums and tanks on the Site
April 1985	EPA notifies O'Connor and Central Maine Power (CMP) of their potential responsibility for contamination at the Site
May 13, 1986	O'Connor and CMP voluntarily enter into an Administrative Order by Consent (AOC) with EPA to conduct a Remedial Investigation and Feasibility Study (RI/FS)
May 19, 1986	MEDEP issues an Administrative Order to O'Connor designating the Site an Uncontrolled Hazardous Substance Site under Maine law
June 23, 1986	MEDEP issues an AOC to O'Connor and CMP
May 23, 1987	EPA and MEDEP issue an amended AOC to O'Connor and CMP. Order extends site limits to approximately 9 acres
June 15, 1989	CMP submits a draft RI/FS to EPA and MEDEP for review
Sept 27, 1989	ROD issued by EPA
Sept 3, 1991	Consent Decree between EPA and CMP signed
June 1994	MEDEP and CMP sign a Declaration of Restrictive Covenant
July 11, 1994	Explanation of Significant Difference (ESD) signed
Oct 20, 1994	Revised Statement of Work (RSOW) issued
Oct 10, 1995	Contingency triggered by EPA
July 1996	Source Control 100% Design completed
Aug-Oct 1996	Phase I of Source Control completed (OU-1)
Oct 1996	First sampling of OU-3, Riggs Brook sediment, performed
Oct 1996	Phase I Vacuum Enhanced Recovery (VER) completed (OU-2)
Jan-May 1997	Phase II VER completed
May-Nov 1997	Phase II of Source Control completed (OU-1)
Nov 11, 1997	Source Control Remedial Action completed
Aug-Oct 2001	Phase III VER completed (OU-2)
April 2002	Draft Technical Impracticability (TI) Evaluation Report submitted to EPA and MEDEP for OU-2 Management of Migration
Sept 13, 2002	First Five-Year Review signed
Sept 13, 2002	Restrictive Covenant recorded in Kennebec County Registry of

DATE	EVENT
	Deeds
Sept 27, 2002	ROD Amendment issued by EPA
Sept 23, 2003	Amendment to Consent Decree signed and 2003 Statement of Work issued
Mar 29, 2004	Amendment to Consent Decree entered in US District Court for the District of Maine
Aug 2005	Tenth annual sampling event of Riggs Brook sediment completed
Aug–Oct 2006	Fourth annual active oil recovery effort in transformer work areas (TWA ) II performed
Sept. 28, 2007	Second Five-Year Review signed
May 13, 2008	Excavation of 100 ft <sup>2</sup> centered on sediment location 3018 performed
Sept 2008	Decommissioning of upgradient and side-gradient monitoring wells
Oct 28, 2009	Final O&M Plan submitted
April 26, 2012	Site inspection for third FYR

### **3.0 BACKGROUND**

#### **3.1 PHYSICAL CHARACTERISTICS**

##### **3.1.1 Setting**

The F. O'Connor Site property consists of approximately 23 acres within a 28-acre property owned by CMP and is located on U.S. Route 17 approximately three miles east of the Kennebec River in Augusta, Maine. The surrounding area is generally rural. The property is bordered on the east by Riggs Brook, a small northerly flowing tributary of the Kennebec River, on the north and west by woodlands, and on the south by Route 17. The property south of Route 17 is generally wooded. A residence abuts the CMP property along its western boundary. The land at the Site was used as farmland until the 1950s when the F. O'Connor Company established a salvage yard and transformer recycling operation at the Site. The MEDEP-designated Hazardous Substance Site consists of the same 23 acres within the 28-acre property. The location of the property is shown on Figure 3-1.

##### **3.1.2 Topography**

The Site is located on a bedrock ridge that transects the Site in a generally northeast-southwest direction. A dirt access road splits the Site from southwest to northeast. North and west of the road, the Site is relatively level, with a low swampy area known as the Upland Marsh. East and south of the road the topography slopes sharply toward Riggs Brook, with a change in elevation of approximately 50 feet. Three water bodies are located on the Site, all of which were created by operations of the F. O'Connor Co. and later reconstructed as part of the source control work. The approximately two-acre Upland Marsh drains to a channel that flows to the Upper and Lower Lagoons and on to the Riggs Brook wetlands. Figure 3-2 shows these features and Site topography.

##### **3.1.3 Subsurface Conditions**

The overburden soils at the Site generally consist, from surface to depth, of glacial marine silts and clays, glacial till, and bedrock. The clay tends to be absent only in areas of shallow bedrock. During source control, approximately 24,000 cubic yards of clean soil were brought to the Site to restore the excavated area to approximate the original grade.

Bedrock drilling completed during site investigations indicated mostly competent rock with very few recognizable fractures. Bedrock outcrops are found in the areas of Transformer Work Areas (TWA) I and III (see Figure 3-2).

The principal groundwater migration pathway on the Site is a discrete zone within the till along the top of the bedrock surface, flowing from west to east away from the residential properties. Groundwater flow from the Upland Marsh (a large recharge basin) is confined and channeled through the bedrock trough in the bedrock saddle centered immediately northeast of the Upper Lagoon. The bedrock flow regime has very little water in storage. The vertical permeability of the bedrock is believed to be very low, creating a "quasi" perched condition of the overburden

groundwater flow system. At the southeastern end of the Site near Riggs Brook the potentiometric surface of the bedrock groundwater is above the ground surface. MW-106B in this area is a free-flowing artesian well. The inferred overburden groundwater contours are shown on the Figure Appendix E.

### **3.2 LAND AND RESOURCE USE**

The Site remains a mix of forest and open field, bordering the Riggs Brook wetland, and unchanged since the 2002 five-year review. The open fields encompass the formerly contaminated areas and the three reconstructed wetlands on the Site (Upland Marsh, Upper Lagoon, and Lower Lagoon). The perimeter fence was removed in a public ceremony with EPA and MEDEP in November 1997. The Site is not actively used by CMP. Surrounding land uses include low-density residential, light agricultural, commercial, fields, and forest. Surrounding land use has not changed since the 2007 FYR.

The January 26, 2012 zoning map for Augusta was reviewed for current zoning designations. The 28-acre property that includes the 23-acre Site is zoned as RRES – rural residential district, where residential development that conserves the rural character of the area is permitted. North of the 28-acre property, the adjacent property is zoned as Planned Development District. This zoning allows for “commercial and industrial uses intended to be concentrated in single or mixed use centers to ensure the most efficient provision of services and minimize impacts on residential and environmental sensitive areas, and the roadway systems”. Examples of these mixed-use centers are present on Cony Road, the first road west and north of the Site. Immediately to the west of the property and extending to the intersection of Cony Road and Route 17, the zoning is Regional Business District. This zoning “provides trade and service opportunities and (is) highway oriented”. South and east of the property, the zoning is also RRES, with an overlay of zoning as Resource Protection District of Riggs Brook and its wetlands, where development would adversely affect water quality, productive habitat, biological ecosystems, or areas with scenic and natural values. The zoning districts have not changed since the 2007 FYR.

Natural resources on the O’Connor property include both terrestrial and aquatic habitats. Large wetland areas in the Riggs Brook watershed have been mapped on the O’Connor property by MEDEP. The Riggs Brook wetlands have been identified as shrub swamps, consisting of a mix of woodlands and emergent aquatic vegetation and peat. No rare or endangered species have been identified in wetland or woodland habitats associated with the Site. The Riggs Brook wetlands are in Zone A according to the City of Augusta Flood Insurance Rate Map (23011C0536D), revised June 16, 2011. Zone A is a special flood hazard area inundated by 100-year flood where no base flood elevations have been determined. There are no other specified flood hazard zones covering the balance of the Site.

There are no mapped sand or gravel aquifers in the vicinity of the Site. Bedrock wells were historically used for domestic water in the surrounding properties west of the Site however public water has been available since at least 2002 throughout the area. In Summer 2009, the Greater Augusta Utility District extended a sewer main east along Route 17 within the right-of-way on the Site.

### **3.3 HISTORY OF CONTAMINATION**

The F. O'Connor Company operated a salvage yard for the dismantling and recycling of electrical transformers and capacitors on the Site from the early 1950s until the late 1970s. This resulted in the release of oil to the ground, principally in the TWAs. Soil and groundwater contamination primarily consisted of PCBs with some volatile and semi-volatile organic compounds, and inorganics. Potential sources of contamination that were identified on the Site included the three TWAs, scrap piles, oil storage tanks, and two lagoons installed to help control oil migration from the Site.

### **3.4 INITIAL RESPONSE**

The first report of contamination was due to an oil spill on the Site in February 1972, which was investigated by MEDEP. Later that year MEDEP requested the O'Connor Company contain all transformer fluids in above ground storage tanks to prevent spills.

In 1976, MEDEP conducted further investigations at the Site and asked the O'Connor Company to construct two surface water lagoons on the Site to control migration of oils. The next year MEDEP requested that the Company discontinue use of the lagoons and reclaim the area. Water from the lagoons was pumped into storage tanks and the sediments excavated and placed in a low area near the gravel access road. (This low area is now within the Designated Area where contaminated soils were consolidated and covered with a foot of clean fill.) The sediments were underlain and covered by one-foot of clay soil. Placement of this soil created a barrier to surface water runoff, and resulted in the creation of the Upland Marsh.

The Site was proposed for inclusion on the National Priorities List (NPL) in December 1982, and placed on the final NPL on September 8, 1983. In April 1985, EPA notified the F. O'Connor Company and CMP of their potential liability for the Site.

CMP completed several additional response activities including placement of a chain link fence around the Site in 1985, removing the above ground storage tanks in 1986, and extending the chain link fence and removing over 500 tons of material from the scrap area in TWA 1 in 1987.

Following completion of an RI/FS in 1989, the ROD for the Site was issued on September 27, 1989. CMP, an identified Potentially Responsible Party (PRP) at the Site, signed a Consent Decree with the United States on September 3, 1991 to undertake remediation of the Site. CMP acquired ownership of the property from the F. O'Connor Company in 1992.

### **3.5 BASIS FOR TAKING ACTION**

The hazardous substances that have been released to the Site are primarily related to PCB oils and scrap from the dismantling of transformers. During the RI, contaminants of concern were identified and an Endangerment Assessment (EA) was performed to estimate the potential adverse human health and environmental effects from exposure to the contaminants of concern. The major conclusions drawn from the Endangerment Assessment are as follows:

- Direct contact with, ingestion of, or inhalation of vapors from soils contaminated with PCBs and carcinogenic polycyclic aromatic hydrocarbons (cPAHs) may pose an incremental increase in cancer risk over a lifetime of exposure. Children potentially playing on the Site currently, or future residents living on the Site would be at the greatest risk. Lead in soils may also pose a risk of adverse, non-carcinogenic health effects (through direct contact and ingestion) by potential future residents living at the Site.
- An increased cancer risk over a lifetime of exposure may also be associated with direct contact and ingestion by children with the PCB-contaminated sediments in the lagoons located on the Site.
- Ingestion of the contaminated groundwater from the deep/bedrock system at the Site may pose potential long-term risks to future inhabitants of the Site. Contaminants of concern are 1,4-dichlorobenzene, benzene and PCBs.
- Environmental risks to biota (i.e., fish, wildlife and plants) exposed to contaminated soils, sediments, or surface waters at the Site may potentially exist from the presence of PCBs, lead and aluminum.

Based on the results of the EA, Applicable or Relevant and Appropriate Requirements (ARARs) and other guidance, target cleanup goals were established to protect human health and the environment from these identified risks. The 1989 ROD selected a remedy for the Site that would meet these target cleanup goals.

In September 2002, a ROD Amendment was signed that included a TI waiver for groundwater for a portion of the Site and made minor changes to the remedies for OU-1 and OU-3. For the ROD Amendment, five additional ARARs were identified for VOCs.

Table 3-1 illustrates the progression from the identification of contaminants in the RI, through the EA, establishment of the initial performance standards in the 1989 ROD, and then modifications first by the 1994 ESD and then by the 2002 ROD Amendment.

The RI identified contaminants of concern found at the site and these are listed in the first column of Table 3-1. The 1988 EA determined that PCBs and PAHs in soil contributed to cancer risk greater than  $10^{-6}$ , and lead was determined to have excess noncarcinogenic hazards. Therefore the 1989 ROD established cleanup goals for these (second column) but not for the other metals listed in the first column. The 1994 ESD modified the cleanup goals for soils and these are shown in the third column.

Similarly, the EA determined that only PBCs, benzene and 1,4-dichlorobenzene in groundwater contributed to cancer risk greater than  $10^{-6}$ . Therefore the ROD established cleanup goals for these but not for bis(2-ethylhexyl)phthalate, chromium and magnesium. Between the 1989 ROD and 2002 ROD Amendment, MCLs or MEGs were established for chlorobenzene, 1,2-dichlorobenzene, 1,3-dichlorobenzene, 1,2,3-trichlorobenzene, 1,2,4-trichlorobenzene, 1,3,5-trichlorobenzene and therefore they were added as performance standards in the 2002 ROD Amendment and these are shown in the fourth column.

Finally, the 1988 EA also determined that PCBs were the major contributor to risk associated with on-site sediments and the 1989 ROD set target cleanup goals for sediment equal to those established for soil and these are noted in the first column.

**Table 3-1: Contaminants of Concern and Cleanup Goals**

Contaminants of Concern <sup>1</sup>	1989 Selected Remedy <sup>2</sup>	1994 ESD <sup>3</sup>	2002 ROD Amendment <sup>8</sup>
<b>Soil</b>			
PCBs	1 ppm	1 ppm (10 ppm DA) <sup>3</sup>	No change
cPAHs	1 ppm	1 ppm (10 ppm DA)	No change
Lead	248 ppm	248 ppm	No change
Cadmium	NA	NA	NA
Copper	NA	NA	NA
Nickel	NA	NA	NA
Zinc	NA	NA	NA
<b>Surface Water</b>			
PCBs	0.065 ppb	0.065 ppb	No change
Lead	1.94 ppb	1.94 ppb	No change
Aluminum	87 ppb	87 ppb	No change
<b>Groundwater</b>			
PCBs	0.5 ppb	0.5 ppb	0.05 ppb
Benzene	5 ppb	5 ppb	5 ppb
1,4-Dichlorobenzene	27 ppb	27 ppb	27 ppb
Bis 2-ethylhexylphthalate	NE <sup>4</sup>	NE	NE
Chromium	NE	NE	NE
Manganese	NE	NE	NE
Chlorobenzene	NE	NE	47 ppb
1,2-Dichlorobenzene	NE	NE	85 ppb
1,3-Dichlorobenzene	NE	NE	85 ppb
1,2,3-Trichlorobenzene	NE	NE	NE
1,2,4-Trichlorobenzene	NE	NE	70 ppb
1,3,5-Trichlorobenzene	NE	NE	40 ppb
<b>On-Site Sediment</b>			
PCBs	1 ppm (5 ppm <sup>5</sup> )	1 ppm (5 ppm <sup>5</sup> )	No change
CPAHs	1 ppm	1 ppm	No change
Lead	248 ppm	248 ppm	No change
Copper	NA	NA	No change
Manganese	NA	NA	No change
Zinc	NA	NA	No change
<b>Riggs Brook Sediment</b>			
PCBs	1 ppm/5 ppm <sup>6</sup>	1 ppm/5 ppm	No change
<b>Riggs Brook Biota</b>			
PCBs	2 ppm <sup>7</sup>	2 ppm	No change

Notes

- 1 Based on Results of the RI
- 2 Based on results of Endangerment Assessment, ARARs, and other guidance and established in 1989 ROD
- 3 Target cleanup goal revised by ESD (Explanation of Significant Differences (July 20, 1994))
- 4 Not established Identified as a COC but no cleanup goal established in ROD or ESD or ROD Amendment
- 5 OU-1 Area 3 soils near Riggs Brook wetland
- 6 1 ppm is the target cleanup goal, 5 ppm is the trigger level for performing additional sampling and determining whether further remedial action is necessary ROD pages 47 and 52, Revised SOW (October 20, 1994), page 15
- 7 ROD page 47 and Revised SOW page 15
- 8 Updated Groundwater Performance Standards specified in the 2002 ROD Amendment and the 2003 SOW

## **4.0 REMEDIAL ACTIONS**

This section describes the remedial actions selected for and implemented at the Site from the 1989 ROD through the 2007 Five-Year Review. Description of remedial activities implemented since the 2007 FYR are provided in Section 6.0. The decision documents in which the remedial actions were selected include the September 1989 ROD, July 2004 ESD, October 1995 Contingency Remedy, and September 2002 ROD Amendment.

### **4.1 REMEDY SELECTION**

The September 27, 1989 ROD for the Site determined that exposure to the contaminated media at the Site may present an imminent and substantial endangerment to public health, welfare, or the environment if the threats were not addressed by a response action. A remedy was selected to meet the following Remedial Action Objectives (RAOs) identified for the Site:

- Reduce potential present and future public health and environmental risks from direct contact, ingestion, and/or dermal absorption with the PCB-, cPAH-, and lead-contaminated soils and sediments located on- and off-site;
- Reduce potential present and future public health risks from the inhalation of PCB vapors
- Reduce potential present and future public health risks from the ingestion of PCB-contaminated fish from Riggs Brook;
- Reduce potential future public health risks from the ingestion of PCB-, benzene-, and 1,4 dichlorobenzene-contaminated groundwater found on the Site; and
- Reduce potential present and future environmental risks to aquatic and terrestrial wildlife from exposures to the PCB-, lead-, and aluminum-contaminated on-site surface water.

The remedy selected in the 1989 ROD included components for Source Control (OU-1) and Management of Migration (OU-2).

#### **4.1.1 Source Control**

The Source Control (OU-1) component of the remedy included:

- Excavation and on-site treatment by solvent extraction technology of all soil and sediment containing concentrations of PCBs and cPAHs greater than 1 ppm and lead greater than 248 ppm;
- Draining and off-site treatment of surface waters from the Upland Marsh, Upper Lagoon, and Lower Lagoon;
- Re-routing of existing drainage patterns from Upland Marsh and lagoons;
- Installation of erosion control measures and clearing of vegetation;
- Transportation and off-site disposal of soil and sediments should solvent extraction not achieve target cleanup levels;
- Establishment of compensatory wetlands;

- Site restoration following excavation activities; and
- Five-year reviews of site conditions.

On July 11, 1994, an ESD was approved. This adjusted the soil target cleanup goals for all soils that would be located more than 12 inches below grade and within a three- to four-acre Designated Area to a maximum 10 ppm for PCBs and for cPAHs, and 248 ppm for lead. The target cleanup goals for soils outside the Designated Area remained at 1 ppm for PCBs and for cPAHs, and 248 ppm for lead (see Column 3 of Table 3-1). The ESD also included a contingency that allowed soils and sediments to be disposed off site without solvent extraction treatment, upon approval by EPA. On October 23, 1995, EPA approved the contingency based upon the determination that the solvent extraction treatment was not feasible to meet the target cleanup goals.

The 2002 ROD Amendment did not substantially alter the Source Control component of the remedy. It made minor changes to the Operations & Maintenance Plan, adding near-surface soil sampling of the Designated Area cover coincident with each five-year review to confirm the integrity and protectiveness of the soil cover. The ROD Amendment also simplified the Designated Area boundary, changing it from a 25-sided to a 10-sided area (see Figure 4-1) with permanent markers placed at the turning points.

#### **4.1.2 Management of Migration**

The MOM groundwater component (OU-2) of the 1989 ROD selected remedy required:

- Establishment of temporary institutional controls until groundwater remediation goals are achieved;
- Installation of groundwater extraction and monitoring wells;
- Installation of an on-site groundwater treatment and recharge system;
- Treatment and recharge system monitoring, operation, and maintenance; and
- Five-year reviews of site conditions.

The MOM also included response actions for Riggs Brook sediment. These included:

- Establishment and implementation of an extensive sediment and biota sampling and analysis program within Riggs Brook;
- Implementation of public education programs; and
- Five-year reviews of site conditions.

A Revised Statement of Work (RSOW) was approved by EPA in 1994. The RSOW defined the remaining work to be completed at the Site and finalized the target cleanup goals for the MOM (see Table 3-1).

In 1996, EPA split management of migration into two operable units: OU-2 for groundwater and OU-3 for Riggs Brooks in order to accelerate the cleanup of the Site.

In September 2002, a ROD Amendment was signed that changed the remedy originally selected in the 1989 ROD for groundwater (OU-2) and made minor changes to the remedies for OU-1 and OU-3.

The 2002 ROD Amendment for OU-2 required permanent institutional controls, active oil recovery, long-term monitoring of groundwater, and five-year reviews. The 2002 ROD Amendment also recognized the technical impracticability of achieving the cleanup levels required by the 1989 ROD in groundwater found on the Site (third RAO of 1989 ROD) within a reasonable timeframe. As a result, it established a Technical Impracticability Zone (TI Zone) for a portion of the Site (including TWA II Area) where state and federal drinking water standards are waived (see Figure 4-1).

Regarding OU-3, the 2002 ROD Amendment restated that the target cleanup goal for Riggs Brook sediment remains at 1 ppm PCBs and cPAHs. The 2002 ROD Amendment also continued the 1989 ROD requirement that: "if an increase in the current PCB sediment levels occurs above the 5 ppm threshold and/or the fish tissue samples are found to be greater than 2 ppm, then a more rigorous sampling effort of such contamination will be conducted to determine the need for and/or extent of further remedial actions to be undertaken within Riggs Brook, if any."

## **4.2 REMEDY IMPLEMENTATION**

Activities completed from the implementation of the remedy through the 2007 FYR are described in this section. This includes the remedy specified in the 1989 ROD as modified by the 1994 ESD, 1995 Contingency, and 2002 ROD Amendment.

### **4.2.1 Source Control (OU-1)**

Source Control was conducted in two phases. Phase I was conducted in the summer and fall of 1996 and included decontamination, demolition and disposal of the barn and other non-native debris, remediation of soils closest to Route 17; and construction of the support area for Phase II activities. Phase II began in May 1997 with work completed on November 11, 1997. Phase II activities included collection and disposal of on-site surface waters, sampling and remediation of soils and sediments in the former TWAs, reconstruction of the Upper Lagoon, Lower Lagoon, and the Upland Marsh and final restoration of the Site. The perimeter fence that had limited access to the Site was removed in November 1997.

Approximately 20,000 tons of soil and sediment were excavated and disposed offsite and another 3,000 tons were consolidated into the Designated Area (see Figure 4-1) to meet the target cleanup goals. Soil and sediment samples were collected using a sampling grid developed to provide a statistically valid approach for confirming that the excavation had met the target cleanup goals (Table 3-1). Additional random samples were collected as determined necessary in the field to confirm attainment of target cleanup goals.

Approximately 24,000 cubic yards of clean backfill (containing less than or equal to 1 ppm PCBs, 1 ppm cPAHs and 248 ppm lead) were brought onsite for re-grading. As set forth in the 1994 ESD, the entire Designated Area was covered with 12 inches of clean fill. This was done to ensure that, even if those soils contaminated with between 1 and 10 ppm PCBs or cPAHs within the Designated Area were ever disturbed by potential future activities at the Site, the PCB and cPAH levels at the surface would likely be less than 1 ppm due to mixing with the clean soil. Excavated areas of the Site outside of the Designated Area were backfilled and re-graded. No additional cover was added in the areas outside the Designated Area.

Site restoration included re-establishing drainage patterns to achieve discharges to Riggs Brook similar to those that existed prior to remediation of the Site. It also included restoration of on-site wetlands and the establishment of compensatory wetlands.

In the fall of 2002, CMP installed and surveyed 10 boundary markers simplifying the Designated Area by reconfiguring it into a 10-sided shape (see Figure 4-1). On April 24, 2007, 10 soil samples were collected of the cover soil on the Designated Area coincident with the 2007 Five-Year Review. The soils samples were below 1 ppm PCBs.

#### **4.2.2 Management of Migration (OU-2)**

Management of Migration response actions selected in the 2002 ROD Amendment included active and passive oil recovery, a technical impracticability waiver for cleanup levels in groundwater in a small area of the Site, permanent institutional controls, and monitoring groundwater to assess the potential for migration of contaminants from the Site. Investigations completed following the 1989 ROD determined that the migration of contaminants in the shallow groundwater in the downgradient direction was limited; the bedrock aquifer had low groundwater storage and therefore a relatively small volume of water. It was also concluded that the 1992 pump test had mobilized the PCB transformer oil and other contaminants vertically downward into the bedrock flow regime. Based on these findings, CMP's consultant recommended continued groundwater monitoring and the use of vacuum extraction recovery (VER) rather than conventional groundwater pumping to eliminate the potential for drawing free-floating product farther into the bedrock aquifer.

Seepage of the transformer oil into the TWA II wells has been observed since it was first induced into the wells during the 1992 pump test. The total amount of oil recovered from the five TWA II wells since their installation using a combination of VER and passive oil recovery is about 125 gallons. Approximately 79 gallons of oil (about 71%) were recovered prior to the completion of the source control work, and approximately 35 gallons (about 28%) after the completion of source control through the summer of 2002. It was because of this amount that was recovered after the successful attainment of soil cleanup, the evaluation of the technical impracticability of restoring the groundwater was initiated. Since the resumption of the VER in 2002, 11.3 gallons of transformer oil have been recovered (or about 1% of the total).

During the second five-year review period, the VER system was operated in August and September of 2002, August to October 2003, August to September 2004, and in August 2006. Oil thickness monitoring at each well during the operation of the VER system showed that the quantity recovered decreased with time. Approximately 7.4 gallons of oil were recovered by the VER system in 2002, 2.5 gallons in 2003, and about 0.3 gallons in both 2004 and 2006. The system was not operated in 2005 because of equipment failure. Significantly there was not any

increase in the amount recovered passively nor was any increase observed when the active recovery resumed in August 2006.

The amount of oil removed from the wells using the VER system has decreased steadily over time to minimal amounts. In December 2006, the VER system was decommissioned because the rate of oil recovery using passive recovery was equal to or greater than with the VER system. Prior to 2005, the passive oil recovery program was conducted monthly. Since 2005, passive oil recovery has continued on a quarterly basis.

**Table 4-1: Gallons of Transformer Oil Recovered From TWA II Area Wells**

Phase	RW-101	OW-202B	OW-204B	OW-301B	OW-302B	Total
Pump Test and pre-VER I & II	-	29.5	0.0	15.0	7.9	52.4
VER I & II (1996 -1997)	26.6	NS <sup>1</sup>	NS	NS	NS	26.6
Passive 1997- 2001	2.3	2.1	0.1	0.2	2.3	11.7
VER III 2001	3.2	1.9	0.0	4.6	10.1	19.8
Passive 01 - 02	0.2	0.2	0.0	0.0	3.5	3.9
VER 2002	0.1	0.6	0.0	0.9	5.8	7.4
Passive 02 - 03	0.0	0.2	0.0	0.0	0.0	0.2
VER 2003	0.2	0.5	NS	0.1	1.7	2.5
Passive 03 - 04	0.0	0.0	0.0	0.0	0.0	0.0
VER 2004	0.1	0.2	NS	0.0	0.0	0.3
Passive 04 - 06 <sup>2</sup>	0.5	0.1	NS	0.0	0.0	0.6
VER 2006	0.1	0.2	NS	0.0	0.0	0.3
<b>Total gallons per Well</b>	<b>33.4</b>	<b>35.7</b>	<b>0.1</b>	<b>20.8</b>	<b>31.8</b>	<b>125.3</b>
Passive 2007 (in Feet <sup>3</sup> )	0.15		0.0	0.0	0.0	0.0
Passive 2008 (in Feet)	0.02		decommissioned	decommissioned	0.0	0.0
Passive 2009 (in Feet)	0.0	0.07	NA	NA	NS	NA
Passive 2010 (in Feet)	0.06		NA	NA	NS	NA
Passive 2011 (in Feet)	0.0	0.05	NA	NA	NS	NA

<sup>1</sup> NS: Not sampled

<sup>2</sup> The VER was not operated in 2005 because of equipment failure

<sup>3</sup> With the termination of active oil recovery, the amount of oil recovered with the absorbent material was minimal and so the total thickness of the oil in the wells was recorded rather than calculating a volume. Oil was recovered only from RW-101 and OW-202

Prior to 2002, the MOM monitoring program (wells outside TWA II) showed that contaminants in groundwater met the 1989 ROD target cleanup goals at the perimeter of the Site. Other groundwater monitoring wells showed decreasing trends for those compounds not yet at the cleanup standard. Within the TWA II area, concentrations of PCBs, benzene, and 1,4-dichlorobenzene exceeded the target cleanup goals. The source of this contamination in groundwater in the TWA II area is believed to be the residual oil trapped in the cracks in the clay and bedrock fractures. Because the remedy was not functioning as intended within the TWA II area, CMP submitted a TI Evaluation Report in June 2002.

The TI Evaluation Report presented a Site conceptual model that explained the technical impracticability from an engineering perspective of restoring the groundwater in the TWA II area to drinking water standards within a reasonable timeframe using the selected remedy. It then evaluated alternative remedial strategies to achieve these standards. The report concluded that none of these alternatives would achieve this RAO, and hence, another approach would be necessary to ensure that the remedy was protective of human health and the environment. The report included a request for a TI waiver from specific ARARs within a small area of the Site that would be established as the TI Zone.

EPA, with concurrence from MEDEP, approved the TI Evaluation Report and prepared a Proposed Plan to amend the 1989 ROD. This Proposed Plan was mailed to the public and then discussed during a public information meeting in June 2002. Following a public hearing in July 2002, the 1989 ROD was formally amended in September 2002.

As stated above, the 2002 ROD Amendment established the TI Zone which encompasses the TWA II area and the area associated with shallow groundwater flow to the south of the TWA II area. Monitoring wells along the boundary of the TI Zone have been monitored to ensure that groundwater performance standards are met outside of the TI Zone.

Institutional controls were established in the form of a Declaration of Restrictive Covenant signed by MEDEP and CMP. This covenant includes the following:

- Any use of the groundwater beneath the Site is prohibited without the written approval of MEDEP;
- Any activity which might disrupt remedial or monitoring measures is prohibited without the written approval of MEDEP; and
- CMP or any subsequent owner shall maintain the Site in a condition adequate to ensure the continued compliance with all applicable standards and to ensure the ongoing adequacy of the remediation.

This Covenant was recorded in the Kennebec County Registry of Deeds on September 13, 2002. A copy of the covenant and a map showing the area covered by the covenant were included as an appendix in the 2007 FYR.

The formal MOM groundwater monitoring program began in October 1995 using 15 of the Site wells (7 overburden and 8 bedrock). A number of wells were removed during soil excavation; new wells have also been added. In addition to the MOM wells, five wells in the former TWA II area are routinely checked for the presence of residual transformer oil.

Since the 2002 five-year review, groundwater performance standards for the seven VOCs specified in the 2002 ROD Amendment have been met in the monitoring wells outside of the TI Zone. PCBs have met the performance standard in the monitoring wells outside of the TI Zone since April 2006. Performance standards for the VOCs have been met for wells outside the TI Zone since April 2002 and inside the TI Zone but outside of the TWA II area since April 2006. Within the TWA II Area, concentrations of PCBs and several VOCs exceed the performance standards.

#### **4.2.3 Riggs Brook (OU-3)**

CMP conducted annual sediment monitoring of Riggs Brook for ten years (1996-2005) as required by the 1989 ROD. Biota sampling in Riggs Brook, which was also required by the ROD, was completed in 1997 and 2000. At EPA's request, the 2000 annual program was supplemented with a sampling grid with 51 additional locations adjacent to Riggs Brook in Areas 2 and 3 of the source control area of the Site.

Biota was sampled in 1997 following completion of the source control work. The next biota sampling event, originally scheduled for 2002, was instead completed in 2000 at the request of EPA.

The ROD/RSOW required that CMP implement a public education program to increase public awareness about the status of contamination within Riggs Brook. The status of Riggs Brook was discussed as a part of the community meetings leading up to and during the source control work. Due to minimal interest expressed by the public regarding Riggs Brook or the Site since the completion of the source control component of the work, further meetings have not been held since the early 2000s.

### **4.3 SYSTEM OPERATIONS/O&M**

The May 2007 Draft O&M Plan described the long-term activities for the Site, including inspections, soil cover sampling, routine maintenance, and repairs as necessary. O&M activities for OU-1 include inspections, wetland construction compliance monitoring and soil sampling of the cover of the Designated Area as a part of five-year reviews. For OU-2, O&M activities include checking the integrity of the groundwater monitoring wells. Sediment and biota monitoring have been completed at OU-3, and therefore, there are no O&M activities associated with OU-3.

Semi-annual inspections for OU-1 have been performed by CMP. The inspections have reported that vegetation is well developed, thicker in some areas than others, and that drainage channels are in good shape and functioning as designed. Following a period when annual mowing was not routinely performed in order to allow the vegetation to establish itself, the TWA II area has been mowed since 2002 and the Designated Area since 2006. Future mowing at the site will be conducted in accordance with the Final O&M Plan.

Compliance monitoring to evaluate wetland vegetation survival and general wetland system recovery was performed in 1998, 1999, 2000, 2002, (years 1, 2, 3, and 5) and the field

investigation for the final monitoring in year 10 was performed in 2007. The 2002 Five-Year Review concluded that the restoration had been attained at that time:

- provided vegetative cover and a diverse plant community,
- contributed to the availability of habitat in the surrounding community, and
- reestablished wetland functions and values.

The 2007 monitoring measured slightly less acreage and less vegetative cover than was recorded prior to remediation, yet the function and value acreage has increased. The restored wetlands had developed wet meadow communities comprised of a dominance of wetland species with a mixture of old-field upland species, which is consistent with the characteristics of natural communities. In addition to the wetland species, the 2007 monitoring identified hydric soil conditions and evidence of hydrology. The wetland communities provide potentially diverse habitat for aquatic and wetland dependent species.

## 5.0 PROGRESS SINCE LAST FIVE-YEAR REVIEW

This is the third five-year review for the Site. The second five-year review, completed by EPA in September 2007, assessed the three operable units and made the following conclusions:

- The remedial action for OU-1 has been completed and is protective of human health and the environment. Exposure pathways that could result in unacceptable risk are being controlled.
- The remedy for OU-2 is protective of human health and the environment. Exposure pathways that could result in unacceptable risk are being controlled with institutional controls covering the entire Site. Ongoing monitoring of the groundwater beyond the TI Zone will continue to ensure that cleanup levels continue to be met.
- The remedy at OU-3 is protective of human health and the environment. Ten years of annual monitoring has shown conditions to be stable with more than 95% of the samples beneath the trigger level for additional action and the mean annual PCB concentrations meeting the target cleanup level in seven of the ten years. The biota sampling results met the target cleanup level, indicating there was no unacceptable risk.

Because the remedial actions at all OUs are protective, the Site is protective of human health and the environment.

Additionally, the 2007 FYR made the following recommendations:

- Change the soil sampling depth to address MEDEP's concerns;
- Revise O&M Plan to add a management approach for burrowing animals to address MEDEP's concerns;
- Develop criteria for determining attainment of MOM; and
- Determine an approach to address sampling location Sed-3018.

The following describes the progress made in addressing these recommendations following the 2007 FYR:

### *Change the soil sampling depth*

The draft O&M Plan was modified with the soil sampling depth in the Designated Area changed to 8 – 12" below ground surface.

### *Revise O&M Plan*

The draft O&M Plan was revised to include addressing possible impacts in soil cover by burrowing animals. With this and the above change, the O&M Plan was made final in October 2009.

*Develop criteria for determining attainment of MOM completion*

Long-term monitoring has continued since the 2007 Five-Year Review and groundwater performance standards continue to be met beyond the TI Zone. Review of other Superfund sites found the most common criteria selected is the collection of three years of data after initial attainment of groundwater performance standards. With performance standards for VOC and PCBs being met continuously since 2002 and 2004, respectively, it was determined that no site-specific criteria needed to be developed.

*Determine approach for sediment location Sed-3018*

During the ten years of sediment sampling, location Sed-3018 exceeded the 5 ppm trigger level on a number of occasions. As there were no other locations with similar results, it was decided to excavate an area centered on this location rather than continue monitoring of the location. In May 2008 a 10-foot square centered on Sed-3018 was excavated a minimum six inches. Approximately two cubic yards were disposed offsite at a special waste landfill. The excavation was covered with jute mat and allowed to reseed naturally.

## **6.0 FIVE-YEAR REVIEW PROCESS**

### **6.1 ADMINISTRATIVE COMPONENTS**

EPA, the lead agency for this five-year review, notified MEDEP and CMP at the beginning of 2012 that the five-year review would take place during the spring and summer of 2012. A meeting was held onsite on April 26, 2012 with the two agencies, CMP, and their consultant, Woodard & Curran, to discuss the site status and components of this five-year review. Claudia Sait of MEDEP is part of the review team.

The schedule established by EPA included completion of the review by September 2012.

### **6.2 COMMUNITY INVOLVEMENT**

EPA prepared a public notice announcing the five-year review and requesting public participation. The notice was published May 25, 2012 in the Kennebec Journal, a daily newspaper in Augusta, Maine. Since the publication of the notice, there has been no response from the public to either MEDEP or EPA regarding the five-year review. This level of response is similar to that of the previous five-year review and to the 2002 ROD Amendment public meeting and hearing.

The Administrative Record for the Site was available at the Lithgow Public Library in Augusta. Given space constraints and the lack of interest in the Site, the Administrative Record was stored in the library's basement. However, it was destroyed in a recent flooding of the basement. EPA will provide the library with electronic copies of the Administrative Record. According to the library's research librarian, there has been little interest in the Site documents.

### **6.3 DOCUMENT REVIEW**

This five-year review consisted of a review of relevant documents including decision documents, work plans, various monitoring reports, and O&M inspection reports. These references are listed in Section 12.0 at the end of this report.

### **6.4 DATA REVIEW**

#### **6.4.1 Source Control OU-1**

Semi-annual Site inspections continue to be conducted by CMP to observe any physical changes at the Site that would compromise the remedy. In the period covered by this review, the inspections have documented that vegetation remains well developed, drainage channels are in good condition and functioning as designed.

In the fall of 2006 the VER system was shut down because the rate of oil recovery using passive recovery was equal to or greater than with the VER system. The passive oil recovery program continues on a quarterly basis.

Soil sampling was conducted in the Designated Area on June 29, 2012 to confirm the integrity of the soil cover. Composite soil samples were collected from ten randomly selected sample locations from a total of 183 grid points within the Designated Area. Sample locations are shown on Figure 6-1. Soil samples were collected from eight to twelve inches below the ground surface, and analyzed for PCBs in accordance with the Quality Assurance Project Plan. The purpose of the soil sampling was to demonstrate the integrity of the soil cover on the Designated Area, and compare the PCB concentrations of the soil samples to the remedial goal of 1 mg/kg. PCBs were detected at five sampling locations shown below. All were well below the soil remedial goal of 1 mg/kg.

**Table 6-1: 2012 Soil PCB Sampling Results**

Soil Sample location	Total PCBs (mg/kg)
1182.12	0.120
1122.12	0.081
1010.12	0.350
1082.12	0.030
1005.12	0.01 J

A review of associated quality control results was conducted to determine the quality of the PCB data. All of the quality control results were compliant with validation criteria indicating that the data are of sufficient quality for its intended end use of characterizing soil conditions at the Site. Soil analytical data, evaluation and quality control/quality assurance summaries are provided in Appendix A.

#### **6.4.2. Management of Migration OU-2**

The results of the MOM monitoring conducted between Fall 2007 and Spring 2011 were reviewed (Spring 2012 results were not available at the time of this report). Beginning in Spring 2008, the sampling frequency was changed from semi-annual to annual. The monitoring program consists of nine wells, four outside the TI Zone and five within the TI Zone and downgradient of the TWA II area. Monitoring for PCBs and VOCs has not been performed in the wells within TWA II where active and passive oil recovery has been employed (RW-101, OW-202B, OW-204B, OW-301B, and OW-302B). The 2002 ROD Amendment lowered the performance standard for PCBs from 0.5 ppb to 0.05 ppb and added performance standards to five VOCs as new MCLs or MEGs were established after the 1989 ROD (see Table 3-1).

**PCBs.** PCBs were not detected above the performance standard in wells located outside of the TI Zone or in those wells within the TI Zone and downgradient of the TWA II area during the period of this review. April 2006 was the last time PCBs above the performance standard were detected in any well outside the TI Zone.

**VOCs.** During this review period, VOCs were not detected above the performance standards in wells located outside of the TI Zone. Additionally, VOCs have typically been non-detect in

these wells. April 2002 was the last time VOCs were detected above the performance standards in any well outside the TI Zone. Additionally, during this review period VOCs were not detected above the performance standards in the five wells within the TI Zone that are downgradient of the TWA II area. April 2004 was the last time VOCs were detected above the performance standards in these five wells. Further, VOC concentrations within this group of wells have been decreasing and were non-detect in April 2011.

During this review period, the only location where PCBs and VOCs exceeded the groundwater performance standards was within TWA II, a smaller area within the TI Zone. The source of this contamination in groundwater in the TWA II area is believed to be the residual oil trapped in the cracks in the clay and bedrock fractures. As stated above, based on the TI waiver established in the 2002 ROD Amendment, groundwater performance standards for PCBs and VOCs were waived for the entire TI Zone (including the TWA II Area).

### **6.4.3 Riggs Brook OU-3**

On September 24, 2007, EPA signed a Final Remedial Action Report for Riggs Brook. This Report documented the completion of the Riggs Brook monitoring and contingency activities, public education programs, five-year reviews, and the implementation of the institutional controls. The Report also provided information on the final inspection conducted in April 2007 for the institutional controls and long-term monitoring program. No monitoring related to OU-3 occurred during this review period.

For further information about the sediment and biota sampling, see Section 6.4.3 in the September 21, 2007 Five-Year Review Report.

## **6.5 SITE INSPECTION**

A site inspection was conducted on April 26, 2012 with representatives from EPA, MEDEP, CMP, and CMP's contractor. The inspection included a walkover focusing on the Designated Area boundary and observations of vegetated cover, monitoring wells and restored wetland areas. The Site is no longer secured with fencing and all but one of the monitoring wells have locks (MW-106B, located just upgradient of Riggs Brook, is the one without a lock. It is a flowing artesian well). In 1997, EPA determined that the fence was no longer necessary once the soil cover was placed over the Designated Area, eliminating this exposure route. There has been no reported vandalism or trespassing on the Site. The vegetation appeared to be well established, given that the inspection was performed at the beginning of the growing season. The riprap spreader swales constructed to direct runoff from the lagoons toward Riggs Brook are in good repair. A small amount of soil was observed to have eroded near the base of the riprap between the upper and lower lagoons. This area was repaired in a follow-up visit by CMP. The site inspection report, including site photos, is included in Appendix B.

The Site was most recently mowed at the end of June 2012 prior to the soil sampling work. Future mowing at the site will be conducted in accordance with the Final O&M Plan. The 2012 site inspection noted the access road is in good repair.

CMP personnel check the Site during the quarterly passive recovery, the semi-annual inspection

events, the annual groundwater monitoring event, and following major storm events. The perimeter trees and other vegetation have become well established in areas where there were no active operations.

No significant development of surrounding areas is underway; municipal water supply is available. As noted in Section 3.2, zoning districts encompassing the Site permit residential development. Institutional controls are established in the Declaration of Restrictive Covenant signed by MEDEP and CMP and recorded in the Kennebec County Registry of Deeds on September 13, 2002. CMP and CMP's contractor reported that there have been no known violations of the terms of the Covenant: no use of the groundwater; no activity that has disrupted remedial or monitoring measures; and the Site is maintained in a condition adequate to ensure the continued compliance with all applicable standards.

## **6.6 INTERVIEWS**

General discussions and observations were documented during the site inspection on April 25 and the soil sampling on June 29, 2012.

Roy Koster, CMP, noted that CMP personnel visit the Site on a quarterly basis to check the wells in the TWA II area for floating oil. When present, oil is collected using absorbent pads that are then taken to a CMP transfer facility in Augusta. In addition to these scheduled visits, CMP personnel also visit the Site after extreme weather events. CMP has no plans to develop the site; noting the Riggs Brook wetlands, the restored wetlands, and the steepness of the slope, CMP believes that there is limited acreage that would be available for redevelopment. Additionally, for the past several decades, most of the development in Augusta has been on the west side of the Kennebec River.

The Code Enforcement Office for the City of Augusta was contacted by telephone on July 2, 2012 to verify the online zoning information and zoning overlay areas. There have been no changes to the zoning or overlay areas since the last five-year review.

## 7.0 TECHNICAL ASSESSMENT

The following sections evaluate the remedy based on its function in accordance with decision documents, its adherence to risk data and scenarios and any other information that could have affected the remedy's protectiveness. ARARs and To Be Considered (TBC) guidance for the Site identified during the development of the 1989 ROD and the 2002 ROD Amendment along with current ARARs and TBCs were provided in Appendix E of the 2007 FYR for reference.

### 7.1 QUESTION A: IS THE REMEDY FUNCTIONING AS INTENDED BY THE DECISION DOCUMENTS?

**ANSWER A: YES**, the source control remedy is complete (Final Remedial Action Report for OU-1 signed in 1998); inspections and sampling indicate the soil cover is functioning as intended; the OU-2 management of migration is meeting cleanup levels outside the TI Zone; and the 2007 Final Remedial Action documented the RAOs for Riggs Brook OU-3 had been met and no further actions were necessary.

#### 7.1.1 **OU-1: Source Control**

Remedial action performance and monitoring results. The 2002 FYR noted that the site was remediated in accordance with the requirements of the 1989 ROD, as modified by the 1994 ESD. The soil excavation and covering of the Designated Area with clean fill reduced public health and environmental risks from direct contact with contaminated soils and sediments, and exposure to surface water. Site inspections since the completion of this component of the work and soil sampling performed in June 2012 show that the integrity of the soil cover placed over the Designated Area has been maintained and the source control remedy is functioning as intended.

Shallow soil samples collected (see Appendix A) of the cover soil were below the performance standard of 1 ppm PCBs. Therefore, the integrity of the soil cover on the Designated Area is intact and the soil cover is functioning as intended.

Operations and Maintenance Costs. In 2009 The Greater Augusta Utility District extended their sewer main east along Route 17 within the right-of-way of the Site. This required some limited blasting in order to place the main below the frost line. Data loggers placed in several monitoring wells did not record any changes in piezometric levels as a result of the blasting. At the completion of the installation, the utility trench was backfilled and the affected area re-seeded with a cover crop. This effort was successful and there is now no evidence of the disturbance. No other maintenance other than the annual mowing and occasional repair of minor erosion (likely animal burrow holes) has been performed. None of these activities has affected the protectiveness of the remedy.

O&M costs are less than originally estimated because site repairs have been minimal. The O&M costs presented do not include the site inspections that are performed by CMP. Annual O&M costs were not available for this review.

Opportunities for Optimization. No opportunities for optimization opportunities for OU-1 were identified during this review.

Indicators of Remedy Problems. Based on site inspections conducted, there do not appear to be

any indicators of remedy problems for OU-1. In 2009 during extension of the public sanitary sewer system by the Greater Augusta Utility District, construction vehicles were parked on the southern edge of the Designated Area. Upon completion of the extension, ruts created in the soil cap were repaired and the area has subsequently re-vegetated and there are no visible indications of the soil disturbance. There have been no other instances of impact to the Site by trespassers.

Implementation of Institutional Controls. The Declaration of Restrictive Covenant prohibits any activity that might disrupt remedial or monitoring measures at the Site or any use of the groundwater beneath the property without prior written approval of MEDEP. Additionally the Declaration of Restrictive covenant requires CMP or subsequent owner to maintain the property, including but not limited to drainage ways, berms, and the soil cover, to ensure the ongoing adequacy of the remediation implemented under the Consent Decree. The implementation of institutional controls has thus far effectively ensured the integrity of the remedial measures conducted at the Site, and has prevented exposure to site soils. The Agreement, Release and Stipulation and the Declaration of Restrictive Covenant were provided as an appendix to the 2002 FYR.

### **7.1.2 OU-2: Management of Migration**

Remedial Action Performance and Monitoring Results. Review of relevant MOM documents and results of the annual groundwater monitoring indicates that the MOM remedy is functioning as intended outside the TI zone. As described earlier in this report, concentrations of PCBs outside of the TI zone have now consistently met the groundwater performance standard since April 2006, and VOCs have met the performance standards since April 2002. Small amounts of residual transformer oil, containing PCBs and VOCs, remain in fractures in the clay and to a limited extent in bedrock. However, because of the inherent surface tension within the clay, little movement of the oil has been observed.

Active oil recovery with the VER was terminated in 2006 as no measurable thickness of oil was found in the TI Zone wells. Minimal oil recovery with the passive oil absorbent socks has occurred since the termination of the VER. Within the TI Zone but outside the TWA II area the groundwater is now meeting performance standards.

Monitoring wells along the boundary of the TI Zone continue to be monitored to ensure that groundwater performance standards are met outside of the TI Zone.

Operations and Maintenance/Costs. O&M costs for the review period were not available but with the shift from semi-annual to annual sampling, monitoring costs during this review period are expected to be less than the \$25K per year that was reported in the 2007 FYR.

Opportunities for Optimization. The groundwater monitoring network, including the frequency and number of wells included in the monitoring network, should be re-evaluated since the performance standards have been met outside the TI Zone consistently since 2006.

Indicators of Remedy Problems. With the remedy modified in 2002 to include a Technical Impracticability waiver for a limited area of the Site, the remedy is functioning as intended and there are no indicators of remedy problems for OU-2.

Implementation of Institutional Controls. The implementation of institutional controls, through the Declaration of Restrictive Covenant, has prevented exposure to contaminated groundwater at the Site and it expected to continue to provide that protection.

### 7.1.3 OU-3: Riggs Brook

Remedial Action Performance and Monitoring Results. Upon the completion in 2005 of the ten years of sediment monitoring and the two biota sampling events, the remedy is functioning as intended by the 1989 ROD, 1994 RSOW, 2002 ROD Amendment and the 2003 SOW. In May 2008 a ten foot by ten foot area was excavated to address one sampling point that had levels near or above the trigger level of 5 ppm PCBs. No further monitoring of OU-3 has been done. A more detailed review of the ten years of OU-3 monitoring results was presented in the 2007 FYR report.

Operations and Maintenance/Costs. Since the remedial action for OU-3 has been completed, there have been no other operation or maintenance costs associated with Riggs Brook.

Opportunities for Optimization. With remedial action completed, there are no optimization opportunities for OU-3.

Indicators of Remedy Problems. The remedy selected for OU-3 functioned as intended and there are no indicators of remedy problems for OU-3.

Implementation of Institutional Controls. The institutional controls discussed in Section 4.2.2 apply to the entire Site, including OU-3, and there have been no infractions of these controls.

## 7.2 **QUESTION B: ARE THE EXPOSURE ASSUMPTIONS, TOXICITY DATA, CLEANUP LEVELS AND REMEDIAL ACTION OBJECTIVES (RAOS) USED AT THE TIME OF REMEDY SELECTION STILL VALID?**

**ANSWER B: YES,** though there have been some limited changes in the toxicity data and cleanup levels since the 1989 ROD, the exposure assumptions and RAOs used at the time of the remedy selection, as modified, are still valid.

### 7.2.1 OU-1: Source Control Remedial Action

Changes in Standards and TBCs. There are no current chemical-specific ARARs that apply to soil contaminants at the Site. The 1989 ROD set target cleanup goals of 1 ppm for PCBs, 1 ppm for cPAHs and 248 ppm for lead. The 1994 ESD kept these cleanup goals for those areas outside the Designated Area while setting cleanup goals of 10 ppm for PCBs, 10 ppm for cPAHs and 248 ppm for lead inside the Designated Area and requiring the top 12-inches of soil on the Designated Area to be comprised of clean fill. The 2007 and 2012 analyses of the soil cover on the Designated Area showed that the concentrations of PCBs in the soil cover are less than 1 ppm.

Maine has updated their Remedial Action Guidelines (MRAGs) for individual PAHs in soil. These guidelines are risk based and are TBCs. A comparison of the individual MRAGs found them to be above 1 ppm which the ROD set for total PAHs, so the MRAGs are less conservative than the ROD standard.

Similarly, the Maine Maximum Exposure Guidelines (MEGs) for groundwater have been updated. These guidelines are risk based and are TBCs. They have been updated several times

since the 1990 ROD, at times increasing and other times decreasing the value. The latest values have lowered the level for 1,3-dichlorobenzene from 85 ppb to 1 ppb. In the sampling events for which data is available, the practical quantification limit was 1 ppb and samples collected outside the TI Zone were non-detect at the PQL so this would not affect the protectiveness of the remedy. Wells within the TI Zone (where all standards, including TBCs are waived) that are downgradient of TWA II generally met this guideline during the review period.

Changes in Exposure Pathways. Seven exposure scenarios were identified in the Endangerment Assessment, including three potential current exposures and four potential future exposures. According to the 2002 ROD Amendment, following the completion of the source control component of the remedy, no exposure pathways associated with OU-1 remained.

Changes in Toxicity and Other Contaminant Characteristics. The contaminants with the greatest cancer risk potential at the Site are PCBs and cPAHs. Since the 2007 FYR the cancer slope factor (CSF) for both PCBs and PAHs has remained the same, indicating no notable change in the risk of cancer at the Site. The reference doses (RfDs) have also remained the same for these two contaminants. To date EPA has not revised the blood lead level of concern. Therefore, there have been no changes in toxicity.

Changes in Risk Assessment Methods. Since the 2007 FYR, EPA has published the Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part F, Supplemental Guidance for Inhalation Risk Assessment) (January 2009) (RAGS F). This document endorses the use of the Reference Concentration (RfC) and Inhalation Unit Risk (IUR) approach to inhalation risk assessment instead of the use of inhalation Reference Doses (RfD<sub>s</sub>) and inhalation Cancer Slope Factors (CSF<sub>s</sub>). A review of the concentrations of soil contaminants of concern from the 1988 EA shows that using the RAGS F approach, combined with current inhalation toxicity values, would not result in excess risk caused by the inhalation pathway for PCBs or cPAHs.

Expected Progress Towards Meeting RAOs. The source control component of the remedy has been completed and the RAOs for OU-1 have been met.

## **7.2.2 OU 2: Management of Migration**

Changes in Standards and TBCs. There have been no changes to the ARARs for groundwater since the 2002 FYR. The 2002 ROD Amendment lists MCLs and 1992 Maine MEGs as chemical-specific ARARs, and the RSOW identifies the more conservative 1992 Maine MEGs as groundwater performance standards (see Table 3-1) where there are both federal and state standards. The MEGs were most recently updated in September 2011, however, as the 1992 MEGs remain as the only promulgated Maine standards, the subsequent updates are To Be Considered guidance rather than as ARARs. A comparison of the 1992 MEGs with the 2011 MEGs found the following changes: benzene (from 5 ppb to 4 ppb); 1,3-dichlorobenzene (from 85 ppb to 1 ppb); and 1,2,3-trichlorobenzene (from no standard established in 1992 to 0.05 ppb).

A review of the 2011 data found no exceedances of the 2011 MEGs outside the TI Zone. The two wells where exceedances for the 2011 MEGs occurred are both within the TI zone and therefore are waived from meeting these levels.

Changes in Exposure Pathways. There have not been any changes in exposure pathways since the 2007 FYR. There are no plans to develop the Site for residential or commercial use.

Changes in Toxicity and Other Contaminant Characteristics. Since the 2007 FYR the CSF for 1,4-dichlorobenzene has been updated to 5.4E-03. This is a reduction from the value of 2.0E-02 used in the 1988 EA which would result in a reduction in the calculated risk. In 2009 a PPRTV Appendix value (RfD = 8.4E-04 mg/kg-d) was established for 1,2,3-trichlorobenzene where previously no value was available. This would result in an increase in the total non-cancer health effects associated with the consumption of Site groundwater. Similarly in 2009 a PPRTV value (CSF = 2.9E-02 (mg/kg-d)<sup>-1</sup>) was newly established for 1,2,4-trichlorobenzene. This would result in an increase in the total cancer risk associated with the consumption of site groundwater. There have been no changes to the toxicity values of PCBs, benzene, chlorobenzene, 1,2-dichlorobenzene, 1,3-dichlorobenzene or 1,3,5-trichlorobenzene since the 2007 FYR. Although changes in toxicity values may increase the total non-cancer health effects or cancer risk associated with consumption of the groundwater, the Declaration of Restrictive Covenant prohibits any use of the groundwater beneath the property without prior written approval by MEDEP. Additionally, when assessing when the entire Site remedy has been completed, a final risk assessment will be performed that will include an evaluation of the cumulative risk.

Changes in Risk Assessment Methods. Since the 2007 FYR EPA has updated the vapor intrusion screening levels. A review of the 2011 MOM groundwater monitoring results identifies detections of 1,2,3-trichlorobenzene, 1,2-dichlorobenzene, 1,3-dichlorobenzene, 1,4-dichlorobenzene and chlorobenzene. Of these contaminants, only 1,4-dichlorobenzene and chlorobenzene are sufficiently volatile and toxic to present a potential risk through the vapor intrusion pathway. 1,4-dichlorobenzene, whose residential screening level is based on a 10<sup>-6</sup> cancer risk and average groundwater temperature of 25C is 2.2 ppb, was detected at 3 ppb in well OW-201B, which is within the TI zone. Chlorobenzene, whose residential screening level is based on a target hazard quotient of 0.1 and average groundwater temperature of 25C is 41 ppb, was detected at 1 ppb in well OW-201B. Because the groundwater flow direction is opposite the location of the building adjacent to the Site, contamination from the Site is not expected to pose a risk under present conditions through the vapor intrusion pathway. However, should the Site be developed for future residential or commercial use, this pathway should be further evaluated.

Expected Progress Towards Meeting RAOs. A TI waiver has been granted for a small portion of the Site groundwater. The TI Zone, about three acres in size, includes and surrounds the TWA II area, and includes the area where concentrations of VOCs (e.g., benzene, 1,4-dichlorobenzene) and PCBs have exceeded groundwater performance standards. Outside the TI Zone, the RAOs for groundwater have been met for VOCs since 2002 and for PCBs since 2006.

### **7.2.3 OU-3: Riggs Brook**

Changes in Standards and TBCs. Sediment quality criteria discussed in the 2002 Five-Year Review have not changed. These criteria continue to be more conservative than the 1989 ROD target cleanup goal of 1 ppm. However, it was agreed by all parties prior to the 1989 ROD, including the USFWS, that negative short-term impacts to the wetlands ecology outweighed the removal of sediments to that level. A trigger level of 5 ppm PCBs for further action was therefore established in the ROD that if exceeded would require more rigorous sampling to

determine the need, if any, for further remedial action. The trigger was exceeded and the sampling program was expanded to refine the extent of exceedances. At the conclusion of ten years of sampling, over 95% of the samples were below the trigger level and the results of the two biota sampling events also were below the performance standard established in the ROD.

Changes in Exposure Pathways. Land use in the Riggs Brook area has not changed since the 2007 FYR and is not expected to change, and there are no additional routes of exposure beyond the ingestion of fish. As described earlier, the threshold limit set in the 1989 ROD was met in the two biota sampling events. With PCBs cleanup levels being attained in the groundwater outside the TI Zone since Spring 2006, and therefore not discharging into Riggs Brook, there is no indication that ingestion of fish pathway will become an unacceptable risk in the future.

Changes in Toxicity and Other Contaminant Characteristics. The major contaminant that was historically detected in Riggs Brook sediments is PCBs. Since the 2002 FYR, the oral CSF for PCBs has decreased to 2 (mg/kg/day)<sup>-1</sup>. Therefore, the potential risk from exposure to PCBs would decrease.

Changes in Risk Assessment Methods. There have not been any changes in the risk assessment methods for sediment since 2002. Therefore the remedy remains protective.

Expected Progress Towards Meeting RAO. The RAOs for OU-3 were met and EPA signed a Final Remedial Action Report for OU-3 in 2007.

### **7.3 QUESTION C: HAS ANY OTHER INFORMATION COME TO LIGHT THAT COULD CALL INTO QUESTION THE PROTECTIVENESS OF THE REMEDY?**

ANSWER C: NO.

#### **7.3.1 OU-1: Source Control Remedial Action**

No information was discovered during this review period that would call into question the protectiveness of the remedy for OU-1.

#### **7.3.2 OU-2: Management of Migration**

No information was discovered during this review period that would call into question the protectiveness of the remedy for OU-2.

#### **7.3.3 OU-3: Riggs Brook**

No information was discovered during this review period that would call into question the protectiveness of the remedy for OU-3.

### **7.4 TECHNICAL ASSESSMENT SUMMARY**

Based on the data reviewed, the site inspection, and the interviews, this review concludes the remedy is functioning as intended by the 1989 ROD, as subsequently modified. There have been no significant changes to the physical conditions of the Site since the 2007 FYR. The response actions required for OU-1 have been completed and the samples taken for the soil cover in OU-1 have been well below the cleanup level. Performance standards for groundwater have been met since 2002 and 2006 for VOCs and PCBs, respectively. Institutional controls are in place to prevent exposure to contaminated groundwater in the TI Zone and soil in the Designated Area.

Since the 2007 FYR, there have been changes in TBCs for groundwater but no changes in standards. There have been no changes in exposure pathways; the two identified in the 2007 FYR remain. There have been some adjustments of the toxicity characteristics, decreasing carcinogenic risks while increasing non-carcinogenic risks. There have some changes in risk assessment methodologies. However with restrictive covenants in place that prevent any use of the site groundwater or construction on the site without written permission from MEDEP, no new information was discovered during this review period for any of the OUs that would call into question the protectiveness of the remedy.

#### **7.4.1 OU-1: Source Control Remedial Action**

The source control portion of the remedy was completed in accordance with the ROD through the excavation and offsite disposal of soil and sediment with greater than 10 ppm PCBs, and the consolidation and covering of soil with less than 10 ppm PCBs into the Designated Area. ARARs that apply to soil on Site have been met pursuant to the ROD, and additional TBCs identified since the ROD have also been met. Land use at the Site has not changed over the years, nor it is expected to in the future, therefore all exposure pathways identified remain valid, and no new pathways relevant to source control have emerged. Although some toxicity values for contaminants onsite have changed, the changes would not affect the outcome of the original Endangerment Assessment since there would be no significant change in cancer risks at the Site. With the completion of this work, the remedial action objectives for OU-1 were met.

#### **7.4.2 OU-2: Management of Migration**

As described in previous sections, documents and sampling results for the MOM portion of the Site show that the remedy is functioning as intended for the groundwater outside the TI Zone. The Declaration of Restrictive Covenant prevents exposure to contaminated groundwater within the TI Zone. There have not been any changes in groundwater standards since the 2002 ROD Amendment.

One new exposure pathway identified since the ROD is the indoor pathway that would potentially exist if buildings were constructed onsite. However, there are currently no plans for any on-site construction and all previously identified pathways remain valid. Additionally, the VOC concentrations in the shallow groundwater do not suggest a significant source of vapors.

There were some changes in toxicity data for site contaminants, however only the oral CSF for benzene indicates a slightly greater risk of cancer than previously determined. Since benzene has not been detected in groundwater outside the TI Zone since spring 2003, this change does not affect the protectiveness, and the original assessment remains valid.

#### **7.4.3 OU-3: Riggs Brook**

Document and data reviews for Riggs Brook indicate that the remedy is functioning as intended by the ROD and RSOW. The institutional controls implemented for the rest of the Site also apply to OU-3. The RAOs for OU-3 have been met and the Final Remedial Action Report for OU-3 was signed in 2007.

## **8.0 ISSUES**

### **8.1 SOURCE CONTROL**

There are no issues associated with OU-1, Source Control. As discussed previously, the remedial action for OU-1 was completed in 1997. Long-term maintenance of the soil cover continues and repairs to minor erosion features when they occur have been made consistent with the O&M Plan. Permanent markers outlining the boundary of the Designated Area have been installed. Sampling of the Designated Area soil cover coincident with the five-year reviews continues. Active oil recovery ended in 2006 and the amount recovered by passive methods during this review period has been minimal.

### **8.2 MANAGEMENT OF MIGRATION**

There are no issues with OU-2, Management of Migration. Performance standards for PCBs and VOCs were met throughout this review period, continuing what began during the previous review period. A new MEG for 1,3-dichlorobenzene has been developed by Maine and that has been met in groundwater outside the TI Zone.

Concentrations inside the TI Zone are also decreasing and are now meeting the ROD performance standards downgradient of the TWA II area and with a few exceptions are also meeting the new TBC for 1,3-dichlorobenzene. Institutional controls have been in place since 2002 and there have not been any violations of these controls.

### **8.3 RIGGS BROOK**

There are no issues with OU-3. The ten years of annual sampling required in the 1989 ROD have been completed and EPA determined that the RAOs for OU-3 have been met.

## **9.0 RECOMMENDATIONS AND FOLLOW-UP ACTIONS**

No issues were identified during this five-year review. The Final Remedial Action Report for OU-1 was signed in 1997. The Final Remedial Action Report for OU-3 was signed in 2007. EPA signed the Superfund Property Reuse Evaluation Checklist for Reporting the Sitewide Ready for Anticipated Use GPRA Measure in 2009. Performance standards for groundwater have been met outside the TI Zone for VOCs since 2002 and for PCBs since 2006.

With the groundwater performance standards now being met for an extended period (ten years for VOCs, six years for PCBs) and no changes in land use, this review identified re-evaluation of the groundwater monitoring program as a possible opportunity for optimization. Therefore it is recommended that the groundwater monitoring program be re-evaluated.

It is also recommended that for each five-year review that the complete laboratory report be included in the monitoring report that precedes the review.

## 10.0

## PROTECTIVENESS STATEMENTS

OU-1: The remedial action for OU-1 has been completed and is protective of human health and the environment. Exposure pathways that could result in unacceptable risk are being controlled through a clean soil cap that covers remaining contamination and institutional controls that have been placed on the Site. The O&M plan was updated and approved in 2009 and its implementation will ensure that the OU-1 remedy remains protective.

OU-2: The remedy for OU-2 is protective of human health and the environment. Exposure pathways that could result in unacceptable risk are being controlled with institutional controls covering the entire Site. Outside the TI Zone, groundwater has met the performance standards for VOCs since Spring 2002 and for PCBs since Spring 2006. Long-term monitoring will continue to ensure that the performance standards continue to be met.

OU-3: The remedy at OU-3 is protective of human health and the environment. Annual sampling of sediments for ten years resulted in over 95% of the samples being below the 5 ppm trigger level with the annual mean PCB concentration varying between 0.38 and 1.72 ppm. Results from the two biota sampling events were below the threshold level of 2 ppm for all samples, with the overall average being below 1 ppm. Site inspections have documented functioning habitat in both the uplands and wetlands.

Sitewide: Because the remedial actions at all OUs are protective, the Site is protective of human health and the environment.

## **11.0 NEXT REVIEW**

The fourth five-year review for the O'Connor Site will be conducted in 2017.

## 12.0 DOCUMENT REVIEW LIST AND REFERENCES

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Woodard & Curran, 2012. *O'Connor Company Superfund Site Quality Assurance Project Plan (QAPP) Amendment*; June 6

Woodard & Curran, 2012, *Soil Sampling Plan, 2012 Five-Year Review, O'Connor Company Superfund Site, Augusta Maine*; June 8

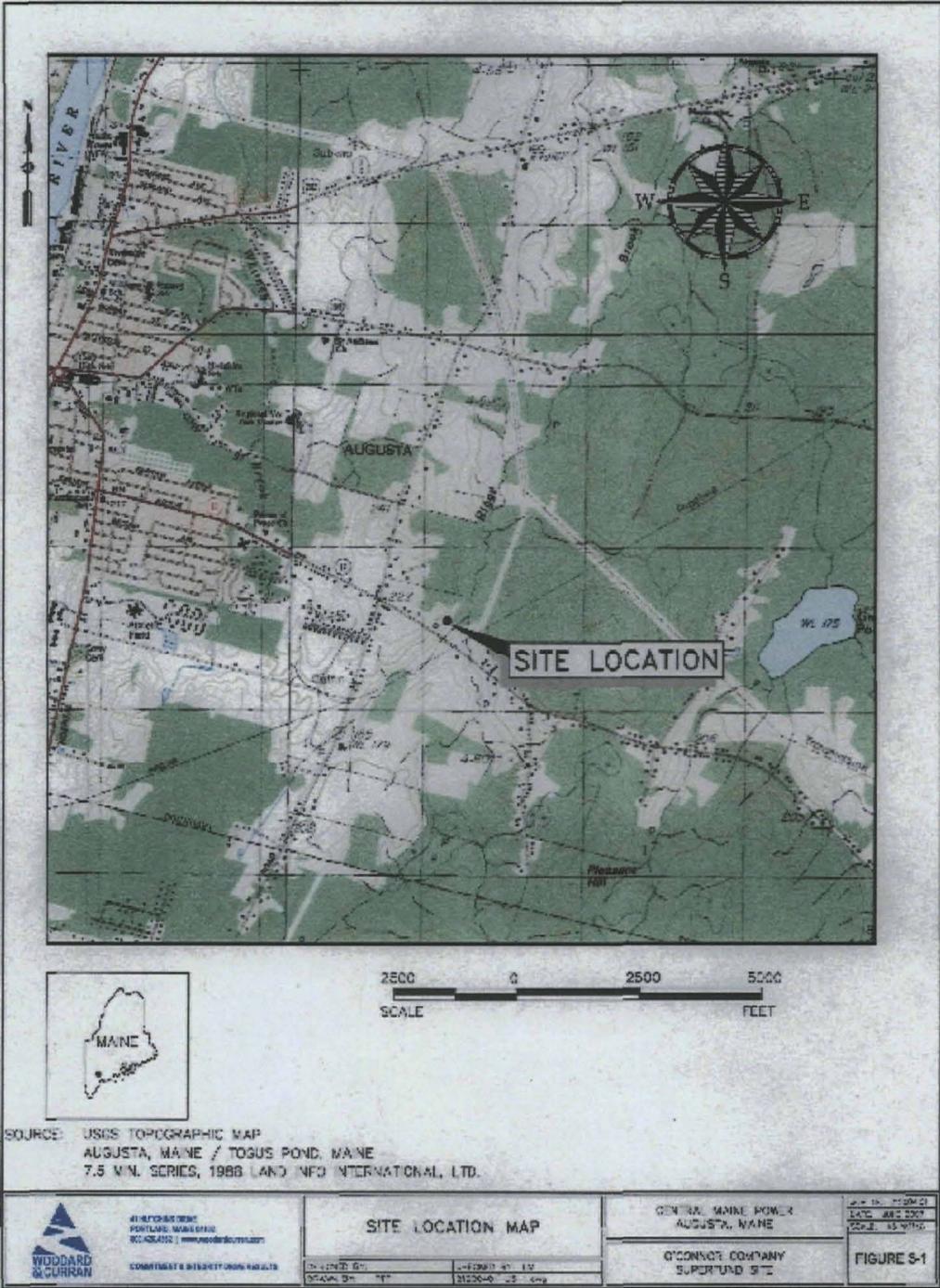
Woodard & Curran, 2012, *Soil Sampling Data and QA/QC Summary, O'Connor Company Superfund Site, Augusta Maine*; July 26

**2012 FIVE-YEAR REVIEW**

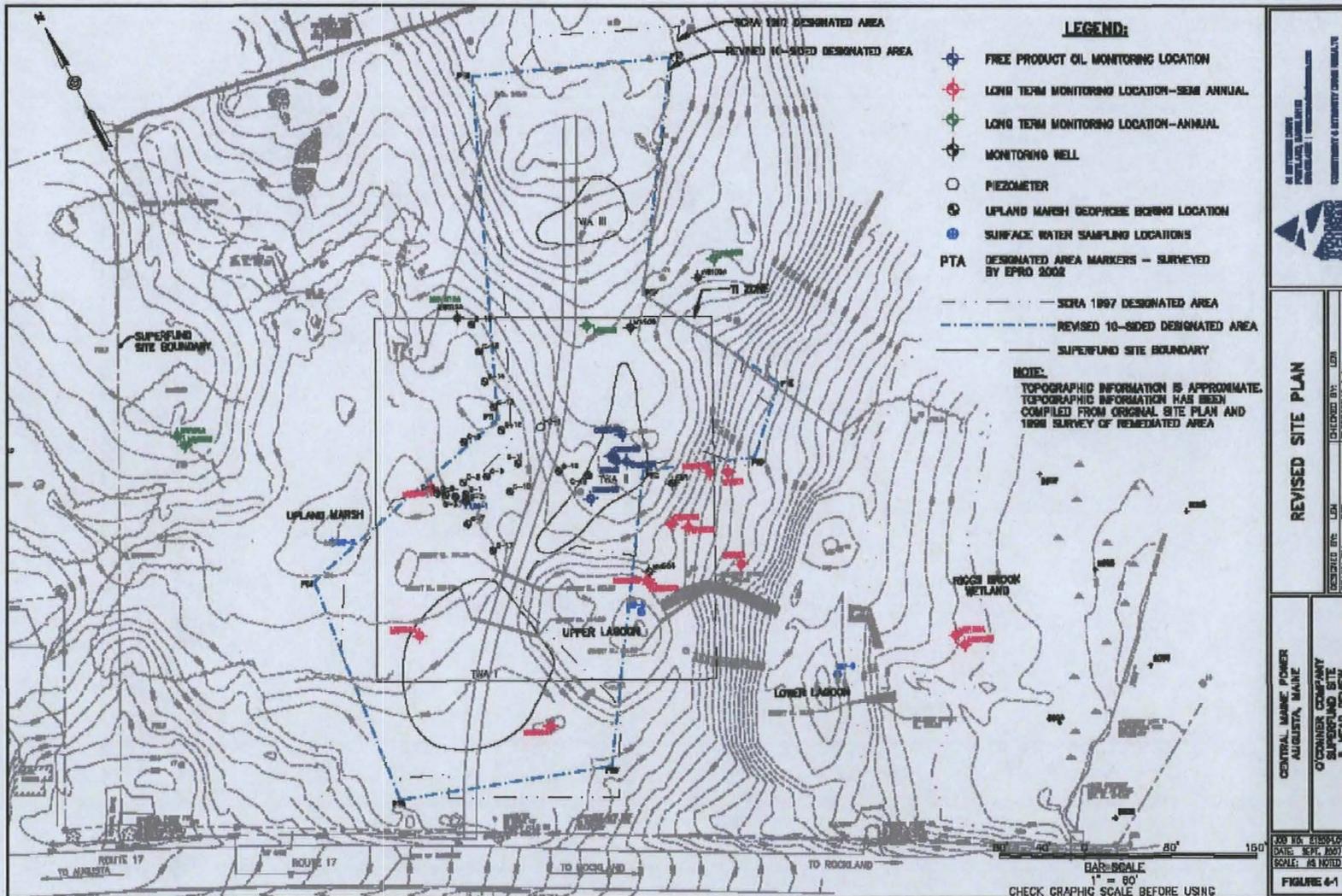
**F O'CONNOR COMPANY SUPERFUND SITE**

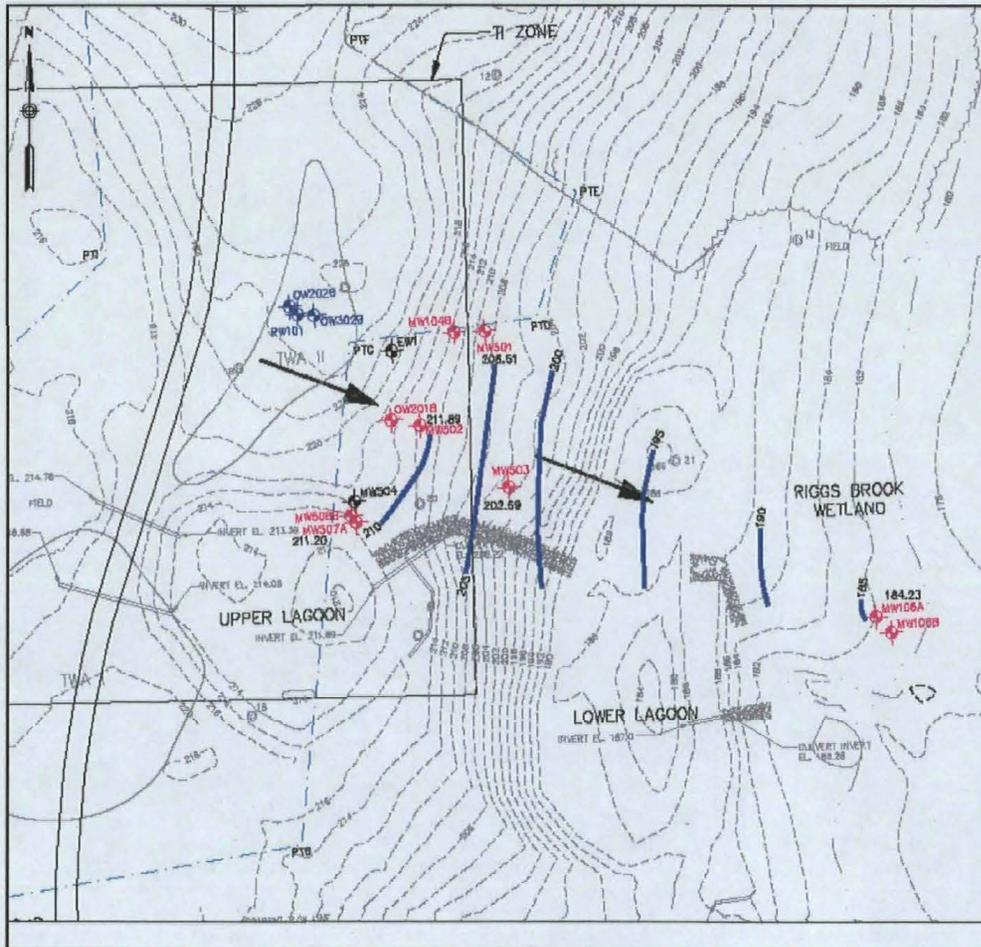
**AUGUSTA, MAINE**

**FIGURES**









- LEGEND:**
- FREE PRODUCT OIL MONITORING LOCATION
  - LONG TERM MONITORING LOCATION
  - MONITORING WELLS DECOMMISSIONED SEPTEMBER 2008
  - PTA DESIGNATED AREA MARKERS - SURVEYED BY EPRO 2002
  - REVISED 10-SIDED DESIGNATED AREA
  - SUPERFUND SITE BOUNDARY
  - GROUNDWATER CONTOUR
  - FLOW DIRECTION

TOPOGRAPHIC INFORMATION IS APPROXIMATE.  
 TOPOGRAPHIC INFORMATION HAS BEEN  
 COMPILED FROM ORIGINAL SITE PLAN AND  
 1999 SURVEY OF REMEDIATED AREA



**INFERRED OVERBURDEN  
GROUNDWATER CONTOURS  
APRIL 2011**

DRAWN BY: [blank] CHECKED BY: [blank]  
 DESIGNED BY: [blank] REVISIONS: 001-C-001-11.001

---

CENTRAL MAINE POWER  
AUGUSTA, MAINE

O'DONNOR COMPANY  
SUPERFUND SITE

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JOB NO: 03040010  
 DATE: JULY 2011  
 SCALE: AS NOTED

**APPENDIX E**

**APPENDIX A**

**F. O'CONNOR SUPERFUND SITE**

**THIRD FIVE YEAR REVIEW**

**SOIL SAMPLING DATA AND QA/QC SUMMARY**

## INTRODUCTION

As part of the 2012 Five Year Site Review and the 2003 Statement of Work (SOW), soil sampling was conducted by Woodard & Curran on June 29, 2012 at the O'Connor Superfund Site (the Site). The objective of the soil sampling program was to demonstrate the integrity of the soil cover on the designated area (DA). As established in the 1994 ESD, the DA is a portion of the Site that was used to consolidate soil and sediment containing levels of polychlorinated biphenyls (PCBs) and/or carcinogenic polyaromatic hydrocarbons (cPAHs), between one and ten ppm during the Source Control Remedial Action (SCRA). As stated in the September 1998 Final SCRA Report, following the regrading of the site with clean backfill (containing less than or equal to 1 part per million (ppm) PCBs, 1 ppm cPAHs and 248 ppm lead), the DA was covered with an additional 12 inches of clean fill. In accordance with the 2003 SOW, the boundaries of the DA were modified as shown in the attached revised Site Plan.

Sample collection and analytical techniques generally followed the specifications contained in the Quality Assurance Project Plan (QAPP) Amendment submitted to the Environmental Protection Agency (EPA) and the Maine Department of Environmental Protection (DEP) on June 8, 2012. The following sections describe the activities and results associated with this soil sampling event.

## SAMPLE POINT SELECTION AND SITE SURVEY

Prior to traveling to the Site, an Excel random number generator was used to select 10 sampling locations from a total of 183 grid points that fall within the DA and within the area where cover soil was applied in 1997. The sample points and the associated coordinates are included in Table 1 below.

Table 1  
O'Connor Superfund Site  
Sample Locations – June 29, 2012 Soil Sampling

Sample Locations	Northing Coordinate	Easting Coordinate
1211.12	536174.814	3064936.18
1095.12	536115.587	3064858.701
1110.12	536086.83	3064859.552
1136.12	535965.5763	3064708.204
1182.12	535973.9169	3064612.105
1122.12	536028.0903	3064649.618
1237.12	536097.53	3064619.554
1010.12	536415.151	3064944.962
1082.12	536147.7	3064919.184
1005.12	536446.1164	3065009.774

A digital global positioning system (DGPS) unit was used to locate each of the sample points prior to collection. Pin flags were placed into the ground to mark the positions of each of the sample point locations. The sample point locations are shown in **Figure 1** and **Figure 2**.

## **SAMPLE COLLECTION METHODS**

After the sample points were located and marked, soil samples were collected in accordance with Woodard & Curran Standard Operating Procedures (see Soil Sampling Plan and QAPP Amendment for 2012 Five-Year Site Review, Woodard & Curran, June 8, 2012). A hand auger was used to get through the top layer of vegetation to a target depth of 8 inches below ground surface. Soil from the 8 to 12" interval was placed in a stainless steel bowl. This process was repeated at four additional sample points within six inches of the original location. The soil from all five sample points at the location were combined and thoroughly homogenized in a bowl to create a composite sample.

At the first location, 1211.12, after the top 8' of soil were removed using the hand auger a stainless steel spoon was used to remove the final 4 inches of soil for the sample. Due to the large volume of soil that was collected from each location it was difficult to fit it all in the stainless steel bowl and to effectively homogenize the material. Therefore the sample collection method was modified after the first location. A stainless steel push tube was pushed by hand the final 4 inches to obtain a sample representing the target depth of 8 to 12 inches below ground surface. The push tube had a diameter of 3/4" which significantly reduced the volume of soil ultimately used for the sample. Using the same procedure additional soil was collected at the same depth from the other four points around the original sample location and homogenized as described above to create the composite sample. A composite soil sample was collected for each of the locations resulting in a total of ten samples.

Sample point 1095.12 was sampled for the Five Year Review in 2007 but was again randomly selected for collection in 2012. In order to collect a representative sample that did not include material that had been part of the 2007 composite sample, the 2012 sample was collected 2 to 3 feet to the west of the actual sample point.

All samples were stored on ice in a cooler immediately following sample collection. After sample collection at each sample point, the hand auger, bowls and spoons were decontaminated with soap/tap water mix, deionized water and methanol to reduce the potential for transfer of PCBs between sample locations.

## **SAMPLE MATRIX DESCRIPTIONS**

With the exception of an aqueous equipment rinsate blank, all of the ten samples collected at the Site were soil. In general the soil samples were representative of the topsoil covering the site. The topsoil was characterized as medium brown, sandy silt containing small amounts of clay. For several of the samples the sample matrix also included some or all of the underlying native material consisting of light grey, stiff clay. Descriptions of the soil collected for sample analysis are summarized with the analytical results in **Table 2** below

## **ANALYTICAL METHODS**

All of the soils samples were analyzed for PCBs using EPA Method 8082. The following Aroclors were identified during sample analysis: 1016, 1221, 1232, 1242, 1248, 1254 and 1260. A method detection limit of approximately 0.017 milligrams/kilogram (mg/kg) per Arochlor was used to ensure consistency with data quality objectives and historical reporting limits. The detection limit is well below the action level of 1 mg/kg. A determination of percent solids was used to adjust raw sample concentrations to dry weight values. All analyses were performed by Katahdin Analytical Services of Scarborough, Maine.

## SAMPLE RESULTS

PCBs were not detected in 5 of the 10 (50%) soil samples. PCBs were detected in samples collected from the following locations: 1182.12, 1122.12, 1010.12, 1082.12 and 1005.12. The range of PCB detections was from 0.01 mg/kg to 0.350 mg/kg. The dry weight sample results are summarized in **Table 2**.

**Table 2**  
**O'Connor Superfund Site**  
**Summary PCB Results**  
**Soil Sampling – June 2012**

Sample Location	Soil Matrix Description	Total PCBs (mg/kg)
1211.12	Topsoil – medium brown sandy silt, small amount of clay, dry	ND
1095.12	Light grey, firm clay, dry	ND
1110.12	Light grey, firm clay, dry	ND
1136.12	Medium brown fine sand, silt, gravel, small rocks, dry	ND
1182.12	Medium brown, sandy, silty gravel, wet	0.120
1122.12	Sandy, silty gravel, small rocks	0.081
1237.12/Duplicate	Sandy, silty, light grey clay	ND/ND
1010.12	0-8" sandy, silt topsoil; 8-12" light grey clay	0.350
1082.12	Sandy, silty light grey clay	0.030
1005.12	Sandy, silty light grey clay	0.01 J

ND = not detected

J = estimated concentration below the detection limit

As indicated in **Table 2**, all of the PCB detections are below the action level of 1 mg/kg, confirming the effectiveness and integrity of the landfill cover applied in 1997. All of the detections were identified as Arochlor 1260. Percent solids values ranged from 73% to 90%.

## DATA QUALITY CONTROL RESULTS

Quality control samples were reviewed to ensure that the data are of a quality sufficient to meet the data objective of site characterization. Data validation was performed at a Tier II level which includes a review of the tabulated quality control results. The quality control results were generally compliant. There were no qualifiers added to any of the soil sample results to indicate estimated or false positive concentrations.

Extractions and analyses of the soil samples were completed within the required holding times. Surrogate recoveries were within specifications for most samples indicating that the instrumentation was functioning properly during sample analysis. Non-compliant recoveries of the surrogate dichlorobenzene were observed in samples 1211.12, 1095.12 and 1237.12.51. There was no impact from this finding since the non-compliant surrogates were from the channel 1 analysis but the results from the channel 2 analysis were used instead. A field duplicate sample was collected at sample point 1237.12 to determine the variability of the PCB concentrations.

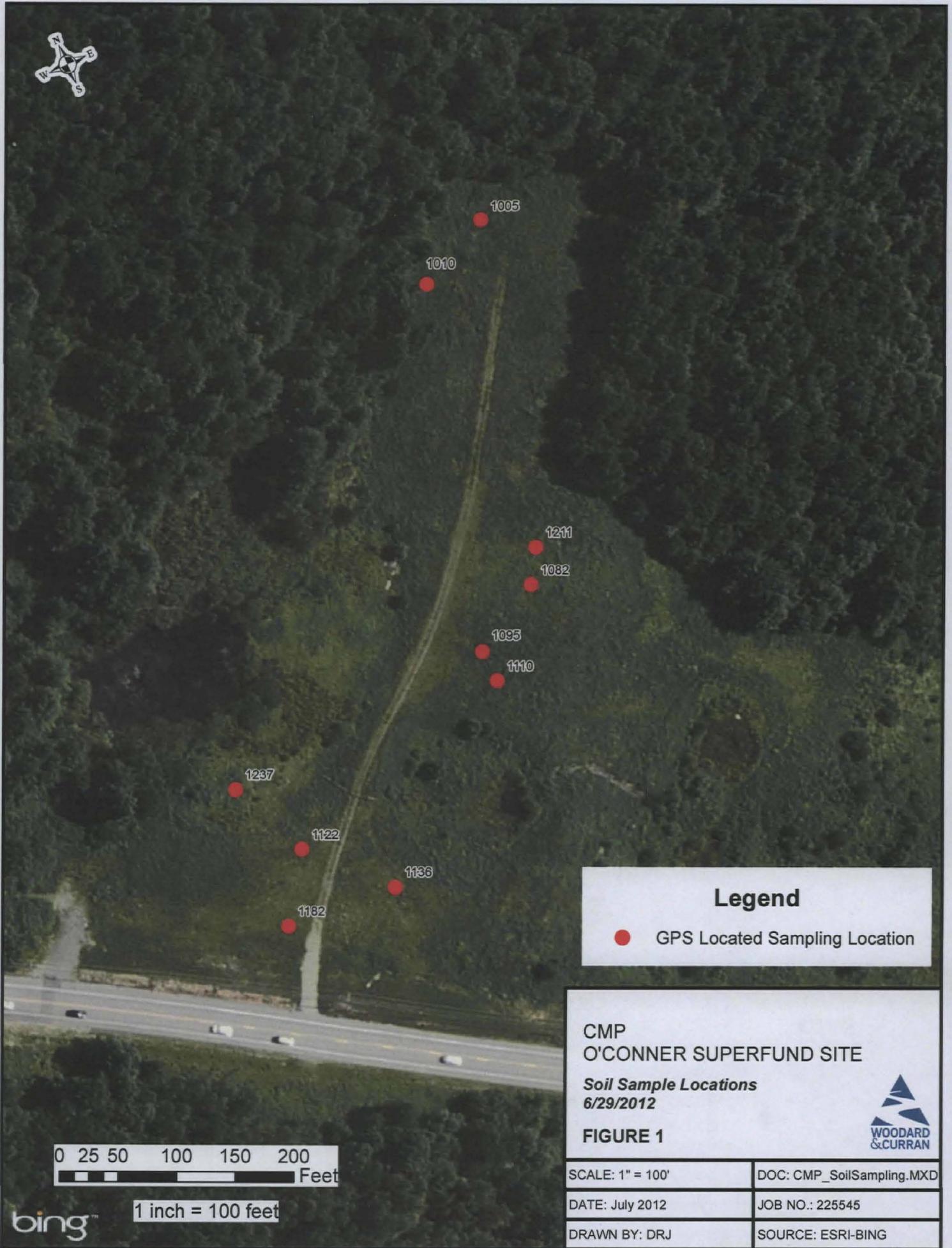
PCBs were not detected above the associated detection limit in either the sample or duplicate. The EPA criterion for compliant field duplicate soils results that compare well with the associated sample is a relative percent difference of 50% or less. The RPD between sample and duplicate concentrations is 0% indicating that PCB concentrations within the soil matrix are relatively homogeneous and that the level of precision is acceptable.

A matrix spike sample was collected at sample point 1010.12 to identify potential biases and to determine levels of precision and accuracy. Recoveries of Arochlor 1016 and 1260 were acceptable indicating that matrix interferences are not likely present in the soil media and that the precision and accuracy demonstrated by the results are acceptable.

An equipment blank, EB-100.12 was collected by pouring deionized water across the end of the hand auger, a spoon and finally into one of the stainless steel bowls used for homogenizing the sample. From the bowl, the water was then poured into 2 one liter glass sample bottles. The blank was analyzed for PCBs to determine the potential for carry over concentrations from one sample location to the next. Although surrogate recoveries were outside of control limits for this sample on both channels 1 and 2, indicating a potential low bias to sample concentrations other quality control results such as the laboratory control sample, were in control suggesting an acceptable level of accuracy was established during sample analysis. The PCBs were not detected in the equipment blank, indicating that decontamination procedures were effective in reducing the potential of carry over between samples.

Laboratory control samples were analyzed to determine analytical accuracy. The recoveries of PCBs in the analyses of the laboratory control samples were acceptable indicating that sample concentrations were accurately quantified.

The quality control results were satisfactory and within criteria for all parameters. As a result, data qualifiers were not added to any sample results. The quality of the data was sufficient to meet the project objective for the O'Connor Site.



### Legend

● GPS Located Sampling Location

CMP  
O'CONNOR SUPERFUND SITE

*Soil Sample Locations*  
6/29/2012

**FIGURE 1**

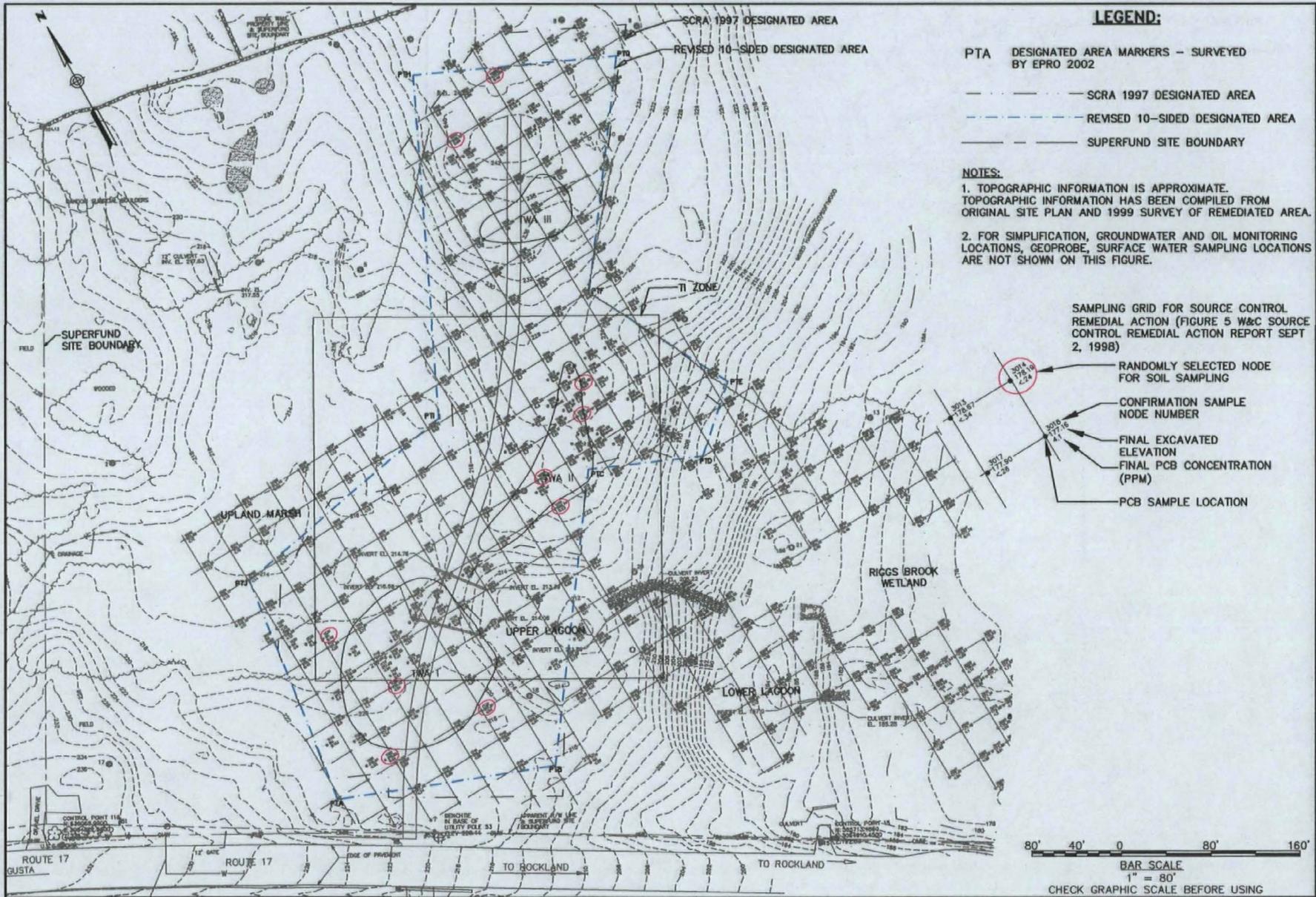


SCALE: 1" = 100'	DOC: CMP_SoilSampling.MXD
DATE: July 2012	JOB NO.: 225545
DRAWN BY: DRJ	SOURCE: ESRI-BING

0 25 50 100 150 200  
Feet

1 inch = 100 feet

bing™



41 HUTCHINS DRIVE  
 PORTLAND, MAINE 04102  
 800.426.4262 | www.woodardcurran.com  
 COMMITMENT & INTEGRITY DRIVE RESULTS



**DESIGNATED AREA  
 SOIL SAMPLING LOCATIONS**

DESIGNED BY: LEM PFF  
 CHECKED BY: LEM  
 DRAWN BY: PFF  
 225545-01.dwg

CENTRAL MAINE POWER  
 AUGUSTA, MAINE  
 O'CONNOR COMPANY  
 SUPERFUND SITE  
 5-YEAR REVIEW

JOB NO: 225545.00  
 DATE: JUNE 2012  
 SCALE: AS NOTED  
**FIGURE 2**

**APPENDIX B**

**F. O'CONNOR SUPERFUND SITE**

**THIRD FIVE YEAR REVIEW**

**SITE INSPECTION CHECKLIST AND PHOTPGRAPHS**



**III. ON-SITE DOCUMENTS & RECORDS VERIFIED** (Check all that apply)

1.	<b>O&amp;M Documents</b> <input type="checkbox"/> O&M manual G As-built drawings G Maintenance logs Remarks <u>CMP maintains maintenance logs/site inspection logs at their office, about ten minutes from the Site. With no ongoing site activities and no trailer/building onsite, no records are kept on the Site.</u>	<input checked="" type="checkbox"/> Readily available <input checked="" type="checkbox"/> Readily available <input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date <input checked="" type="checkbox"/> Up to date <input checked="" type="checkbox"/> Up to date	N/A N/A N/A
2.	<b>Site-Specific Health and Safety Plan</b> <input type="checkbox"/> Contingency plan/emergency response plan Remarks: See comment above	<input checked="" type="checkbox"/> Readily available <input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date <input checked="" type="checkbox"/> Up to date	N/A N/A
3.	<b>O&amp;M and OSHA Training Records</b> Remarks: See above	<input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date	N/A
4.	<b>Permits and Service Agreements</b> <input type="checkbox"/> Air discharge permit <input type="checkbox"/> Effluent discharge <input type="checkbox"/> Waste disposal, POTW <input type="checkbox"/> Other permits _____ Remarks _____	<input type="checkbox"/> Readily available <input type="checkbox"/> Readily available <input type="checkbox"/> Readily available <input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> Up to date	X N/A X N/A X N/A X N/A
5.	<b>Gas Generation Records</b> Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	X N/A
6.	<b>Settlement Monument Records</b> Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	X N/A
7.	<b>Groundwater Monitoring Records</b> Remarks _____	<input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date	<input type="checkbox"/> N/A
8.	<b>Leachate Extraction Records</b> Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	X N/A
9.	<b>Discharge Compliance Records</b> <input type="checkbox"/> Air <input type="checkbox"/> Water (effluent) Remarks _____	<input type="checkbox"/> Readily available <input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input type="checkbox"/> Up to date	X N/A X N/A
10.	<b>Daily Access/Security Logs</b> Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	X N/A



2. **Adequacy**                     ICs are adequate                     ICs are inadequate                     N/A  
 Remarks: The entire Site is part of a property that is wholly owned by CMP. The environmental restrictions placed on the deed require CMP to get written approval from MEDEP before undertaking any activity that might affect the remedy.  
As part of the remedy, the Designated Area has been identified onsite by the placement of markers at each of the ten turning points of the Designated Area perimeter.

**D. General**

1. **Vandalism/trespassing**     Location shown on site map                     No vandalism evident  
 Remarks In 2009 Greater Augusta Utility District extended the sanitary sewer line in the Route 17 ROW on the north side of the road. Vehicles and equipment were parked on the southern portion of the Designated Area creating some ruts that CMP repaired. No visible signs remain of this trespassing but it does indicate the possibility of other trespasses.

2. **Land use changes on site**  N/A  
 Remarks \_\_\_\_\_

3. **Land use changes off site**  N/A  
 Remarks: In the five years since the last review, there has been no change in land use along Route 17 from the intersection with Cony Road, quarter-mile west of the Site, to the surface water divide a mile to the east.

**VI. GENERAL SITE CONDITIONS**

**A. Roads**                     Applicable                     N/A

1. **Roads damaged**                     Location shown on site map                     Roads adequate                     N/A  
 Remarks: \_\_\_\_\_

**B. Other Site Conditions**

Remarks: Vegetation cover is full. Designated Area is mowed annually so no brush or woody-stemmed plants on the soil cover.

**VII. LANDFILL COVERS**     Applicable     N/A\*

\* Although there is no landfill on this Site, part of the remedy included a twelve-inch soil cover over a 3-4 acre portion of it that is called the "Designated Area", and as such, some of the items below are relevant to the remedy.

**A. Landfill Surface**

1. **Settlement (Low spots)**                     Location shown on site map                     Settlement not evident  
 Areal extent \_\_\_\_\_                    Depth \_\_\_\_\_  
 Remarks \_\_\_\_\_

2. **Cracks**                     Location shown on site map                     Cracking not evident  
 Lengths \_\_\_\_\_                    Widths \_\_\_\_\_                    Depths \_\_\_\_\_  
 Remarks \_\_\_\_\_

3. **Erosion**                     Location shown on site map                     Erosion not evident  
 Areal extent \_\_\_\_\_                    Depth \_\_\_\_\_  
 Remarks \_\_\_\_\_

4.	<b>Holes</b> Areal extent <u>1' by 2'</u> Remarks <u>During the April 26, 2012 site inspection, an apparent burrow hole was noted adjacent to the riprap leading from the upper lagoon. CMP filled in the burrow before the June 29 soil sampling event.</u>	<input type="checkbox"/> Location shown on site map Depth <u>six inches</u>	<input type="checkbox"/> Holes not evident
5.	<b>Vegetative Cover</b> <input type="checkbox"/> Trees/Shrubs (indicate size and locations on a diagram) Remarks _____	<input checked="" type="checkbox"/> Grass <input checked="" type="checkbox"/> Cover properly established	<input checked="" type="checkbox"/> No signs of stress
6.	<b>Alternative Cover (armored rock, concrete, etc.)</b> Remarks <u>Rip rap in the drainage paths remains in place. Vegetation is growing up through the rip rap which will further slow down the flow of surface water and decrease the possibility of erosion.</u>	<input type="checkbox"/> N/A	
7.	<b>Bulges</b> Areal extent _____ Remarks _____	<input type="checkbox"/> Location shown on site map Height _____	<input checked="" type="checkbox"/> Bulges not evident
8.	<b>Wet Areas/Water Damage</b> <input checked="" type="checkbox"/> Wet areas <input type="checkbox"/> Ponding <input type="checkbox"/> Seeps <input type="checkbox"/> Soft subgrade	<input type="checkbox"/> Wet areas/water damage not evident <input checked="" type="checkbox"/> Locations shown on site map <input type="checkbox"/> Location shown on site map <input type="checkbox"/> Location shown on site map <input type="checkbox"/> Location shown on site map	Areal extent _____ Areal extent _____ Areal extent _____ Areal extent _____
Remarks: <u>There are three created wetlands onsite dating back to the 1970s. The westernmost one was created when soils excavated for the creation of the other two wetlands (upper and lower lagoons) were placed in an upland area of the site, effectively damming surface water drainage. The two lagoons were originally required by MEDEP as sediment retention ponds, and were restored to wetlands post-source control activities. The last wetland monitoring report indicated that they are dominated by wetland species consistent with natural communities and provide function and value habitat.</u>			
9.	<b>Slope Instability</b> Areal extent _____ Remarks _____	<input type="checkbox"/> Slides <input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> No evidence of slope instability
<b>B. Benches</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A (Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)			
<b>C. Letdown Channels</b> <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A (Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.) <u>See comments above on armored rock</u>			
1.	<b>Settlement</b> Areal extent _____ Remarks _____	<input type="checkbox"/> Location shown on site map Depth _____	<input checked="" type="checkbox"/> No evidence of settlement

2.	<b>Material Degradation</b>	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> No evidence of degradation
	Material type _____	Areal extent _____	
	Remarks: _____		
3.	<b>Erosion</b>	<input type="checkbox"/> Location shown on site map	No evidence of erosion
	Areal extent 1' x 2' _____	Depth _____	
	Remarks: Likely from a burrowing animal. It was repaired following the April 26, 2012 site inspection.		
4.	<b>Undercutting</b>	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> No evidence of undercutting
	Areal extent _____	Depth _____	
	Remarks _____		
5.	<b>Obstructions</b>	Type _____	<input checked="" type="checkbox"/> No obstructions
	<input type="checkbox"/> Location shown on site map	Areal extent _____	
	Size _____		
	Remarks _____		
6.	<b>Excessive Vegetative Growth</b>	Type _____	
	<input checked="" type="checkbox"/> No evidence of excessive growth		
	<input type="checkbox"/> Vegetation in channels does not obstruct flow		
	<input type="checkbox"/> Location shown on site map	Areal extent _____	
	Remarks _____		
<b>D. Cover Penetrations</b> <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A			
3.	<b>Monitoring Wells</b> (within surface area of landfill)		
	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning	<input type="checkbox"/> Routinely sampled <input checked="" type="checkbox"/> Good condition
	<input type="checkbox"/> Evidence of leakage at penetration	<input type="checkbox"/> Needs Maintenance	<input type="checkbox"/> N/A
	Remarks _____		
<b>E. Gas Collection and Treatment</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A			
<b>F. Cover Drainage Layer</b> <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A			
1.	<b>Outlet Pipes Inspected</b>	<input checked="" type="checkbox"/> Functioning	<input type="checkbox"/> N/A
	Remarks _____		
2.	<b>Outlet Rock Inspected</b>	<input checked="" type="checkbox"/> Functioning	<input type="checkbox"/> N/A
	Remarks _____		
<b>G. Detention/Sedimentation Ponds</b> <input type="checkbox"/> Applicable <input type="checkbox"/> N/A			
1.	<b>Siltation</b>	Areal extent _____	Depth _____ <input type="checkbox"/> N/A
	<input type="checkbox"/> Siltation not evident		
	Remarks: <u>Lower Lagoon remains open water as designed, though the pervious channel material of the riprap channels limits the amount of surface water flow into the lagoons.</u>		

2.	<b>Erosion</b>	Areal extent _____	Depth _____
	<input checked="" type="checkbox"/> Erosion not evident		
	Remarks _____		
3.	<b>Outlet Works</b>	<input type="checkbox"/> Functioning	<input checked="" type="checkbox"/> N/A
	Remarks _____		
4.	<b>Dam</b>	<input type="checkbox"/> Functioning	<input checked="" type="checkbox"/> N/A
	Remarks _____		
<b>H. Retaining Walls</b>		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
<b>I. Perimeter Ditches/Off-Site Discharge</b>		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
<b>VIII. VERTICAL BARRIER WALLS</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A			
<b>IX. GROUNDWATER/SURFACE WATER REMEDIES</b> <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A			
<b>A. Groundwater Extraction Wells, Pumps, and Pipelines</b>		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
<b>B. Surface Water Collection Structures, Pumps, and Pipelines</b>		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
<b>C. Treatment System</b>		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
Remarks: <u>Vacuum enhanced system for recovery of separate phase transformer oil was terminated after 2006 annual recovery event. Equipment was cleaned and removed from the Site; semi-truck trailer that was used to store the equipment onsite has also been removed.</u>			
1.	<b>Monitoring Wells</b> (pump and treatment remedy)	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning <input checked="" type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition
		<input type="checkbox"/> All required wells located	<input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A
	Remarks: <u>Casing of one well in the TI Zone has been damaged that prevents purging. This well was decommissioned.</u>		
<b>D. Monitoring Data</b>			
1.	Monitoring Data	<input checked="" type="checkbox"/> Is routinely submitted on time	<input checked="" type="checkbox"/> Is of acceptable quality
2.	Monitoring data suggests:	<input checked="" type="checkbox"/> Groundwater plume is effectively contained	<input checked="" type="checkbox"/> Contaminant concentrations are declining
<b>D. Monitored Natural Attenuation</b>			
1.	<b>Monitoring Wells</b> (natural attenuation remedy)	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning <input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition
		<input type="checkbox"/> All required wells located	<input type="checkbox"/> Needs Maintenance <input checked="" type="checkbox"/> N/A
	Remarks _____		
<b>X. OTHER REMEDIES</b>			
If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.			
<b>XI. OVERALL OBSERVATIONS</b>			

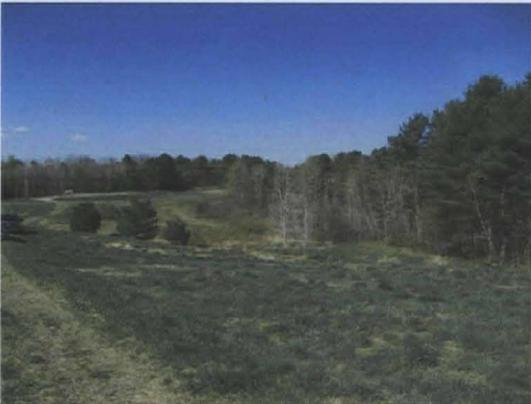
<b>A. Implementation of the Remedy</b>
<p>Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).  <u>See Sections 3 and 4 (what remedy is to accomplish) and Section 7 (whether remedy is effective and functioning as designed)</u></p>
<b>B. Adequacy of O&amp;M</b>
<p>Describe issues and observations related to the implementation and scope of O&amp;M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy. <u>Observations indicate that only minimal maintenance is needed for the source control component. Fifteen years after the completion of the source control activities, vegetation is well established over the Site. With no further active remediation anticipated at the Site, long-term maintenance needs are expected to remain minimal.</u></p>
<b>C. Early Indicators of Potential Remedy Problems</b>
<p>Describe issues and observations such as unexpected changes in the cost or scope of O&amp;M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.  <u>No indications of potential remedy problems were observed during the site inspection for this five-year review; nor during the regularly scheduled inspections.</u></p>
<b>D. Opportunities for Optimization</b>
<p>Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. <u>Since the groundwater performance standards have been met consistently outside the TI Zone for VOCs ten years and six years for PCBs, further reduction in the groundwater monitoring program in terms of number of locations and frequency of sampling appears to be warranted.</u></p>

# O'CONNOR SUPERFUND SITE

## 2012 Five-Year Review Site Inspection Photographic Record



**Photo No: 1**  
**Date:** 4/26/2012  
**Comments:** At the high point of the Site at the TWA III area, on the access road, looking toward Route 17.



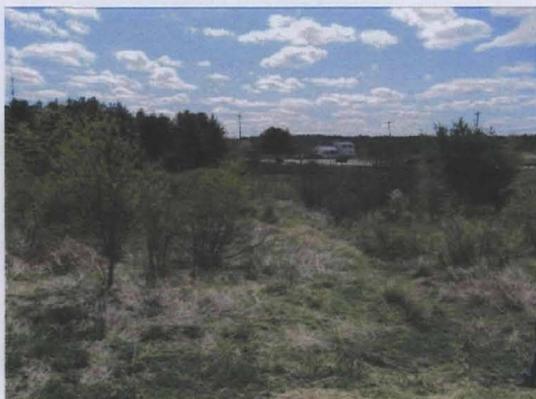
**Photo No: 2**  
**Date:** 4/26/2012  
**Comments:** Toward the wetland area west of the access road.



**Photo No: 3**  
**Date:** 4/26/2012  
**Comments:** From the TWA II area toward the lower lagoon.

# O'CONNOR SUPERFUND SITE

## 2012 Five-Year Review Site Inspection Photographic Record



**Photo No: 4**

**Date: 4/26/2012**

**Comments:** From the lower lagoon area looking toward Riggs Brook and its wetlands.



**Photo No: 5**

**Date: 4/26/2012**

**Comments:** Standing near upper lagoon looking southeast toward the lower lagoon and Riggs Brook.



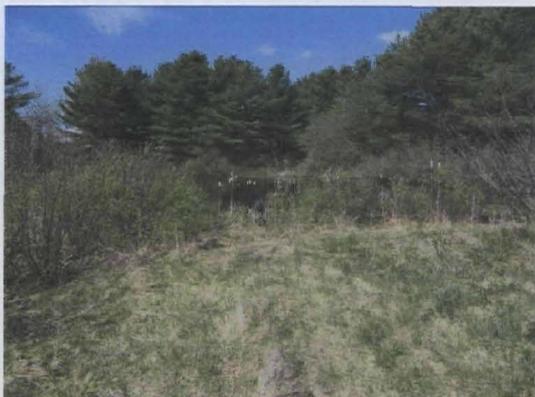
**Photo No: 6**

**Date: 4/26/2012**

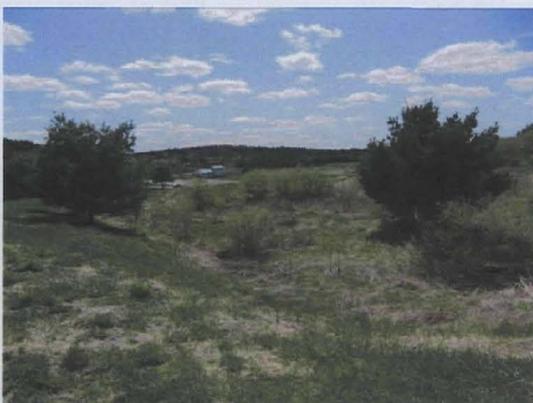
**Comments:** Standing near upper lagoon looking east toward the lower lagoon and Riggs Brook.

# O'CONNOR SUPERFUND SITE

## 2012 Five-Year Review Site Inspection Photographic Record



**Photo No: 7**  
**Date: 4/26/2012**  
**Comments: Upland wet area.**



**Photo No: 8**  
**Date: 4/26/2012**  
**Comments: Upper lagoon/wetland.**



**Photo No: 9**  
**Date: 4/26/2012**  
**Comments: Near Route 17 and end  
of access road, facing uphill.**

**APPENDIX C**

**F. O'CONNOR SUPERFUND SITE**

**THIRD FIVE YEAR REVIEW**

**MEDEP COMMENT LETTER ON DRAFT FIVE-YEAR REVIEW**



STATE OF MAINE  
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PAUL R. LEPAGE  
GOVERNOR

PATRICIA W. AHO  
COMMISSIONER

August 30, 2012

Mr. Terrence Connelly  
U.S. Environmental Protection Agency – New England  
5 Post Office Square, Suite 100, Mailcode: OSRR07-1  
Boston, MA 02109-3912

Re: F. O'Connor Superfund Site-Third Five Year Review  
Augusta, Maine

Dear Mr. Connelly:

The Maine Department of Environmental Protection (MEDEP) has reviewed the draft final "Third Five-Year Review Report for the F. O'Connor Site", in August, Maine (received via email on August 8, 2012) and has the following comments.

**General Comments:**

1. This may be more an issue for the delisting but only the contaminants of concern are included in the Management of Migration reports and on the lab sheets. MEDEP requests that the full suite of VOCs be included so that it can be determined that no newly listed VOCs or VOCs with revised toxicity values are in groundwater.
2. MEDEP's Remedial Action Guidelines for soil has risked based criteria (To be Considered) for individual PAHs. Did EPA consider the change from a single concentration for carcinogenic PAHs to individual carcinogenic PAHs?

**Specific Comments:**

3. List of Acronyms: The acronym OU does not appear to be in the list.
4. Section 3.1.2, Topography, last sentence: Figure 3-2 was not included in the draft report. Also it would be advantageous to include a less cluttered figure (without the iso-contour lines or grids) in the report and show TWA II and the TI areas as these are discussed in the report.
5. Table 4-2, Columns 2 & 3: There seems to be a column missing for OW-202B for Total Gallons Per Well or it is merged with the data for RW-101.
6. Section 5.0, Development criteria for determining attainment of MOM completion: It is unclear from the statement whether the criteria were developed.

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AUGUSTA, MAINE 04333-0017  
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RAY BLDG, HOSPITAL ST

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106 HOGAN ROAD, SUITE 6  
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PORTLAND  
312 CANCO ROAD  
PORTLAND, MAINE 04103  
(207) 822-6300 FAX (207) 822-6303

PRESQUE ISLE  
1235 CENTRAL DRIVE, SKYWAY PARK  
PRESQUE ISLE, MAINE 04679-2094  
(207) 764-0477 FAX (207) 760-3143

7. Section 6.2, Community Involvement, para 2: In regards to the Administrative Record being at Lithgow Library, MEDEP was informed that the record is no longer available at the library because they recycled it when the basement flooded. EPA may want to revise this information.
8. Section 6.4.1, Source Control OU 1, para 3: "Ten composite soil samples were collected from randomly selected sample locations from a total of 183 grid points within the 10 sided Designated Area."

For clarity MEDEP suggests the follow language: "~~Ten~~ Composite soil samples were collected from 10 randomly selected sample locations from a total of 183 grid points within the ~~10-sided~~ Designated Area."

9. Section 6.4.2, Source Control OU-1, VOCs, para 1&2: "During this review period, VOCs were not detected above the performance standards in the five wells within the TI Zone and downgradient of the TWA II area." "Within the TWA II area concentrations of PCBs and several VOCs have exceeded the groundwater performance standards."

These two statements appear to be contradictory as the TWA II area is within the TI Zone.

10. Section 7.1.1, OU-1, Source Control, Indicators of Remedy Problems: The report should briefly discuss the unauthorized use of the property in 2009 as a staging area for equipment and equipment maintenance during the installation of the sewer line by the Greater Augusta Utility District. The soil cover within the Designated Area was damaged and had to be restored by CMP. EPA may want to consider moving the existing fence southerly along the access road to restrict unauthorized traffic from entering that portion of the Designated Area and prevent future damage to the soil cover.
11. Section 7.2.1, OU-1, Source Control Remedial Action, Changes in Standards and TBCs: "There are no current chemical specific ARARs that apply to soil contamination at the Site."

Did EPA consider the risk based Maine Remedial Action Guidelines for Soil Contaminated with Hazardous Substances (January 2010) which is To Be Considered guidance?

12. Section 7.2.1, OU-1, Source Control Remedial Action, Changes in Risk Assessment Methods: "A review of the concentration of soil contaminants of concern from the 1988 EA show that using the RAGS F approach, combined with current inhalation toxicity values, would not result in excess risk caused by the inhalation pathway for PCBs or cPAHs."

What is the calculated risk from inhalation?

13. Section 8.0: Please see comments 1 and 10 above.
14. Section 8.2, Management of Migration: "Concentration inside the TI Zone are also decreasing and are now meeting the performance standards downgradient of the TWA II area."

Monitoring wells 104B, 507A, OW-201B, which are located outside TWA II but inside the TI zone exceeded the 2011 MEG for 1,3-dichlorobenzene of 1 ppb for 4 years out of the last 5 monitoring events. The exceedance of the TBC guidance should be discussed.

15. Section 9.0, Recommendations and Follow Up Actions: MEDEP suggests that occasionally (every 5 years just prior to the Five Year Review) that the entire VOC results be included in the monitoring event report and that the fence across the access road be moved so that unauthorized vehicles cannot damage the soil cover in that portion of in the Designated Area.

Thank you for the opportunity to review and comment on this document and MEDEP looks forward to continuing to working with EPA on environmental issue at this and other sites.

Respectfully

A handwritten signature in cursive script that reads "Claudia Sait". The signature is written in black ink and is positioned above the printed name and title.

Claudia Sait  
Project Manager  
Bureau of Remediation & Waste Management

Cf: File