

## **4.0 REMEDIAL ACTIONS**

This section describes the remedial actions selected for and implemented at the Site.

### **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 response objectives 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 from the Site;
- 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 ROD included components for Source Control and Management of Migration.

#### **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 all surface waters on the Site;

- Re-routing of existing surface water drainage patterns;
- 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;
- Five-year review of site conditions.

On July 11, 1994 an ESD was approved and appended to the ROD. Based on an assessment of the ability to implement the ROD remedy, the ESD 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 PCBs and cPAHs and 248 ppm lead. The target cleanup goals for soils outside the Designated Area remained at 1 ppm PCB and cPAH and 248 ppm lead (see Column 3 of Table 3-1). The ESD also provided for a contingency remedy that allowed soils and sediments to be disposed off site without solvent extraction treatment, pending USEPA approval. On October 23, 1995 USEPA invoked the contingency remedy, based upon the determination that the solvent extraction treatment was not feasible to meet the target cleanup goals.

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

The MOM groundwater component (OU-2) of the 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 review of site conditions.

The MOM also included remedial actions for Riggs Brook sediment (OU-3). 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 review of site conditions.

A Revised Statement of Work (RSOW) was submitted on October 20, 1994 and appended the Consent Decree. 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).

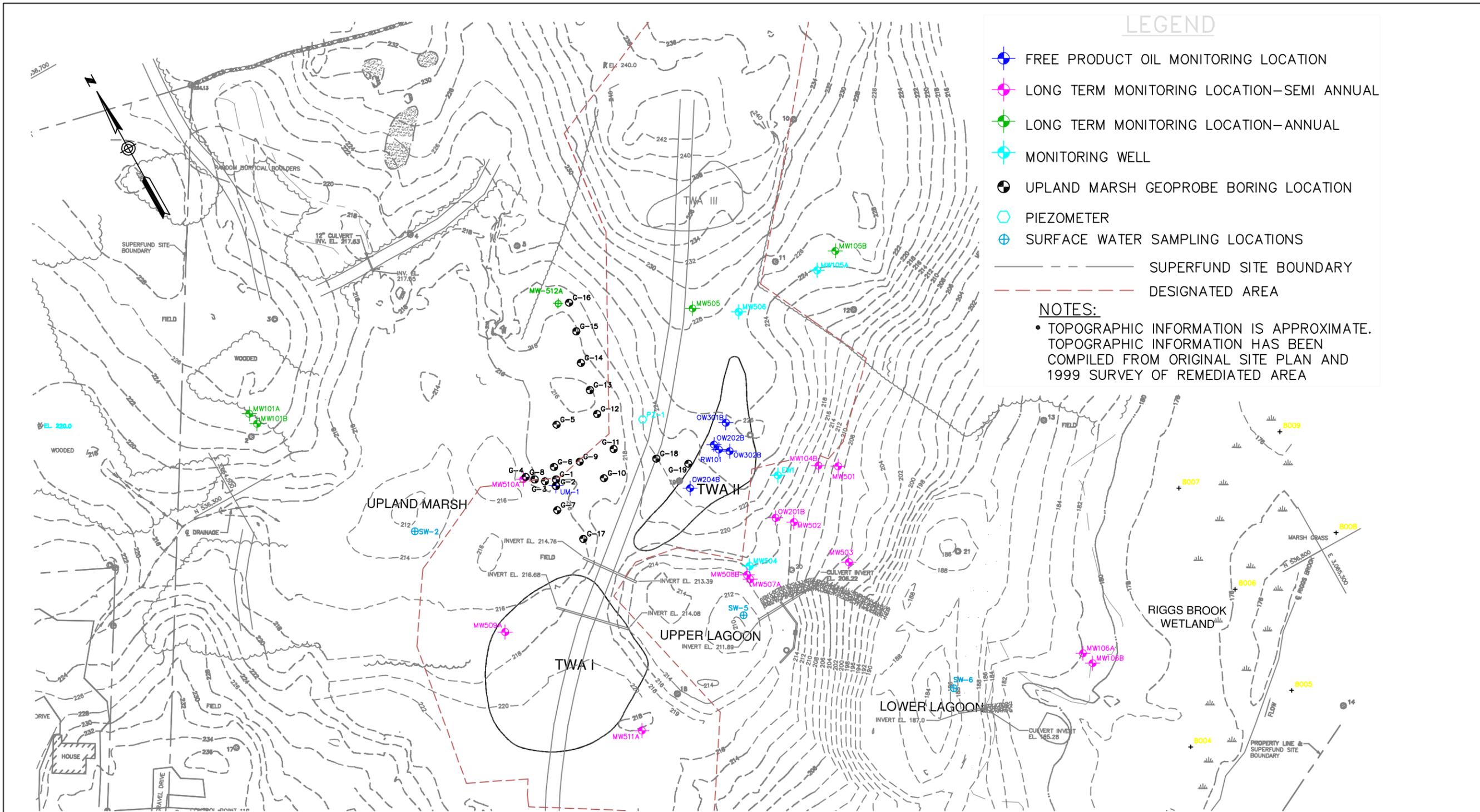
## **4.2 Remedy Implementation**

Activities completed during the implementation of the remedies specified in the ROD are described in this section.

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

The SCRA, OU-1, was completed 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, and the SCRA was 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 and the remainder of OU-1, reconstruction of the Upper Lagoon, Lower Lagoon and the Upland Marsh and final restoration of the Site. Institutional controls limiting access to the Site were included in the form of a perimeter site fence.

Approximately 23,000 tons of soil and sediment were excavated and disposed off-site or consolidated into the Designated Area (see Figure 4-1) to meet the target cleanup goals. As listed in Table 3-1, the target cleanup goals for soil outside the Designated Area were 1 ppm PCBs, 1 ppm cPAHs, and 248 ppm lead; and 1 ppm PCBs for on-Site sediments in the vicinity of the Riggs Brook Wetland area. Target cleanup goals within the Designated Area were 10 ppm PCBs, 10 ppm cPAHs and 248 ppm lead. 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. Additional random samples were collected as determined necessary in the field to confirm attainment of target cleanup goals.

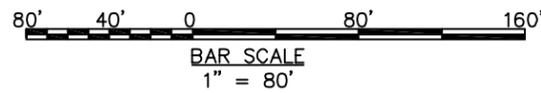


**LEGEND**

- FREE PRODUCT OIL MONITORING LOCATION
- LONG TERM MONITORING LOCATION—SEMI ANNUAL
- LONG TERM MONITORING LOCATION—ANNUAL
- MONITORING WELL
- UPLAND MARSH GEOPROBE BORING LOCATION
- PIEZOMETER
- ⊕ SURFACE WATER SAMPLING LOCATIONS
- SUPERFUND SITE BOUNDARY
- - - DESIGNATED AREA

**NOTES:**

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



SOURCE: WOODARD & CURRAN

|                                                    |                                     |
|----------------------------------------------------|-------------------------------------|
| <b>SITE PLAN</b>                                   |                                     |
| O'CONNOR COMPANY SUPERFUND SITE — FIVE—YEAR REVIEW |                                     |
| AUGUSTA, MAINE                                     |                                     |
| DRAWN BY: D.W. MACDOUGALL                          | REV.: 0                             |
| CHECKED BY: P. CALL                                | DATE: SEPTEMBER 4, 2002             |
| SCALE: AS NOTED                                    | FILE NO.: DWG\4254\0600\FIG_4-1.DWG |

FIGURE 4-1

**TETRA TECH NUS, INC.**

55 Jonspin Road      Wilmington, MA 01887  
(978)658-7899

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 on-site for re-grading. The entire Designated Area was covered with 12 inches of clean fill 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 regraded. 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 approximately 0.4 acres of compensatory wetlands. The SCRA was completed on November 11, 1997.

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

Management of Migration remedial actions for groundwater are ongoing and include monitoring groundwater to assess the potential for migration of contaminants from the Site. Investigations completed following the ROD determined that the migration of contaminants in the shallow groundwater in the downgradient direction is limited; the bedrock aquifer has low groundwater storage and therefore a relatively small volume of water. It was also concluded that the 1992 pump test had mobilized oil and other contaminants vertically downward into the bedrock flow regime. Based on these findings the RP contractor recommended continued groundwater monitoring and the use of vacuum extraction rather than conventional groundwater pumping, to eliminate the potential for drawing free floating product further into the bedrock aquifer (W&C, 2000).

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 has not been recorded and is currently held in escrow by MEDEP. A copy of the covenant and a map showing the area covered by the covenant are included in Appendix E.

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. The 16-well monitoring network now consists of 10 overburden and 6 bedrock wells. In addition to the MOM wells, five wells in the former TWA II area are routinely checked for the presence of residual oil.

Seepage of oil into the TWA II wells has been observed since oil was first introduced into the wells during the 1992 pump test. Approximately 29.8 gallons of oil was recovered from these wells in October 1994. A VER system was applied to an overburden recovery well in the TWA II area in 1996 and 1997, removing approximately 26.6 gallons of residual oil from the till/bedrock interface. Following the completion of the SCRA in 1997, oil seepage into the wells decreased significantly. Between the end of the SCRA and the summer of 2001, approximately 7.1 gallons of oil was recovered from the wells. The VER Phase III was operated in the fall of 2001 and removed approximately 19.8 gallons of oil. The total amount of oil recovered from the five TWA II wells since their installation is approximately 85.2 gallons. (W&C, 2000; W&C 2001d).

To date the MOM monitoring program (wells outside TWA II) has shown that the groundwater meets the ROD target cleanup goals at the perimeter of the Site. Other groundwater monitoring wells show decreasing trends for those compounds not yet at the cleanup standard. Within the TWA II area, concentrations of PCBs, benzene, and 1,4-dichlorobenzene exceed 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. The TWA II area wells are the subject of an application for a Technical Impracticability (TI) waiver being sought by CMP.

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

The 10-year Riggs Brook sediment sampling and analysis program began in October 1996, and has continued on an annual basis every fall. There have been sporadic exceedances of the 5 ppm trigger level for PCBs over time, and in accordance with the program described in the ROD, in 1997 two hot-spot sediment areas were excavated. At EPA's request, the 2000 annual program was supplemented with a sampling grid with 51 locations adjacent to Riggs Brook and in Areas 2 and 3 of the former Source Control area of the Site. Four locations exceeded the Riggs Brook trigger level for PCBs of 5 ppm. In addition, two locations in the former Source Control Area 2 exceeded the Source Control target PCB level of 1 ppm. As of the fall 2001 sampling, concentrations of PCBs slightly exceeded the Riggs Brook trigger level at one location.

Biota was sampled in 1997 following completion of the SCRA. The next biota sampling event, scheduled for five years later, was instead completed in 2000 at the request of USEPA. Concentrations of PCBs in biota were below the threshold level of 2 ppm in both sampling events.

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 part of the Community Meetings and interaction leading up to and during SCRA. Due to minimal interest expressed by the public regarding Riggs Brook or the Site since the completion of SCRA, further meetings have not been held.

### **4.3 System Operations/O&M**

An O&M plan for the Site calls for a 10-year post-closure monitoring period that will include inspections, routine maintenance, and repairs as necessary. O&M activities for OU-1 include inspections and wetland construction compliance monitoring. For OU-2, O&M activities cover checking the integrity of the Site groundwater monitoring wells. Since OU-3 consists of sediment and biota monitoring, there are no O&M activities.

Site inspections for OU-1 have been performed by CMP. CMP's inspections have reported that vegetation is well developed, thicker in some areas than others, and that drainage channels are in good condition and functioning as designed. Annual mowing has not been routinely

performed, as planned, in order to allow the vegetation to establish itself. However, access to the wells and site access road has not been a problem. Minor erosion on the eastern slope of the Site was repaired in May 1999. The only erosion noted since was some small rill erosion on the western bank of the Lower Lagoon; the area was allowed to re-vegetate naturally. Minor ruts in the access road were repaired in September 1999.

Compliance monitoring to evaluate wetland vegetation survival and general wetland system recovery has been completed annually for three years following the completion of wetland restoration in 1997. Monitoring will continue in years 5 (2002) and 10 (2007) to assess the success of the wetland restoration and achievement of the goals established in the design phase. The year 3 (2000) restoration report (Smart 2001) concluded that the Site had a post-restoration wetland acreage shortfall of approximately 0.2 acres in 2000. The report's assessment of other goals of the project concluded the restoration has:

- maximized the percent of cover and the diversity of the plant community,
- established effective erosion control and stabilization measures,
- contributed to the availability of habitat in the surrounding community, and
- reestablished wetland function and values.

O&M costs for OU-1 include site inspections and site repairs. O&M costs were originally estimated at approximately \$15,000 for year 1 and \$3,000 for years 2 through 10. According to the RP contractor, costs have been lower than originally estimated in the O&M plan because the Site has not been mowed and the only significant repair work was minor erosion and access road repair conducted in 1999. O&M costs, provided by the RP contractor, are shown in Table 4-1. These costs do not include the semi-annual site inspections performed by CMP, CMP labor costs, or the wetland construction monitoring performed by The Smart Associates. The RP contractor plans to revise and submit the O&M Plan.

O&M costs for OU-2 have been limited to the costs of groundwater monitoring. No maintenance has been required to date for the wells. According to the RP contractor, groundwater monitoring costs are approximately \$50,000 per year. Since there is no O&M associated with OU-3, there are no associated O&M costs.

**TABLE 4-1  
 ANNUAL SYSTEM OPERATIONS/O&M COSTS – OU-1  
 FIVE-YEAR REVIEW REPORT  
 O’CONNOR COMPANY SITE  
 AUGUSTA, MAINE**

| <b>Dates</b> |           |                   |
|--------------|-----------|-------------------|
| <b>From</b>  | <b>To</b> | <b>Total Cost</b> |
| 11/97        | 11/98     | \$250             |
| 11/98        | 11/99     | \$1500            |
| 11/99        | 11/2000   | \$250             |
| 11/2000      | 11/2001   | \$250             |

## **5.0            PROGRESS SINCE LAST FIVE-YEAR REVIEW**

This is the first Five-Year review for the Site.

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

### **6.1 Administrative Components**

EPA, the lead agency for this five-year review, notified MEDEP and the RPs in early 2002 that the five-year review would be completed. The RPs agreed to assist in preparing portions of the required information. CMP's environmental consultant, Woodard & Curran, Inc., provided USEPA with material for the review. This effort was conducted between January and April 2002. USEPA issued a scope of work to TtNUS, W.A. No. 123-FRFE-0133, under the USEPA RAC1 contract 68-W6-0045, on March 1, 2002 to assist USEPA in performing the five-year review. The USEPA Work Assignment Manager was Nancy Smith; support was provided by Terrence Connelly, the USEPA Remedial Project Manager for the O'Connor Site. Wilkes Harper and Hank Andolsek of the MEDEP were part of the review team. The Draft Five-Year Review Report was provided to MEDEP for their review in early July. MEDEP transmitted comments to EPA in a letter dated August 9, 2002 (see Appendix F).

The original schedule established by USEPA specified completion of the five-year review by August 2002.

### **6.2 Community Notification and Involvement**

EPA issued a press release on May 8, 2002 that was published in the Kennebec Journal announcing EPA's review of the progress of the O'Connor Site cleanup. The press release encouraged public participation. There is no established Community Advisory Group. To date EPA, MEDEP and CMP have encountered little participation or involvement from the local community. All site-related documents are available at the Lithgow Public Library in Augusta. According to staff at the library there has been limited use of the documents.

### **6.3 Document Review**

This five-year review consisted of a review of relevant documents including decision documents, work plans, and various monitoring reports (See Appendix A).

## **6.4            Data Review**

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

Since the completion of the remedial action for the Source Control Operable Unit at the Site in 1997, semi-annual site inspections have been conducted by CMP to observe any physical changes at the Site that would compromise the remedy. In addition, wetlands construction monitoring was conducted annually for years 1, 2, and 3 following wetlands restoration in 1997, and will be conducted in years 5 and 10. Inspection reports conclude that vegetation is well developed, drainage channels are in good condition and functioning as designed. The most recent wetland monitoring report concludes the overall Site is providing the interspersion of wetland and upland communities for the recovery of available wildlife habitats (Smart, 2001). The report also noted an approximately 0.2 acre shortfall in the post-restoration wetland area.

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

Historic results of the MOM monitoring, excluding the five wells located in the TWA II area, conducted between October 1995 and September 2001 and prior analytical results were reviewed. Target cleanup levels have been set for PCBs (0.5 µg/L), benzene (5 µg/L) and 1,4-dichlorobenzene (27 µg/L). There are no established cleanup standards for other VOCs in the 1989 ROD.

PCBs. Aside from a few initial sampling events (prior to 1994), concentrations of PCBs in groundwater samples collected from wells outside of the TWA II Area have not exceeded the ROD target cleanup level for PCBs (0.5 µg/L). The results of March 1999 groundwater analyses using USEPA Modified Method 680 for total homologue PCBs showed total PCB and estimated maximum possible concentrations ranging from 0.02 – 0.09 µg/L, well below the ROD target cleanup level. (W&C, 1999)

VOCs. Concentrations of volatile organic compounds (VOCs) have been fluctuating and generally decreasing, and are near target cleanup goals in wells outside the TWA II area. The downward trend in VOC concentrations is most evident in the bedrock wells. The concentrations in the overburden wells are generally low and near or below the target cleanup levels. The benzene target (5 µg/L) has not been exceeded in any of the MOM wells, and has generally

been found to be below or close to the detection limit. Based on a review of the historical groundwater monitoring data, the concentrations of 1,4-dichlorobenzene have fluctuated and have frequently exceeded the target (27 µg/L) in three of the MOM wells (MW-104B, OW-201B, and MW-507A). These wells are all located slightly downgradient of the TWA II area. These exceedances are summarized below.

| <u>MW Number</u> | <u>Lowest Conc. [Date]</u> | <u>Highest Conc. [Date]</u> | <u>Latest Conc.[Date]</u> |
|------------------|----------------------------|-----------------------------|---------------------------|
| MW-104B          | <2.5 ppb [3/26/97]         | 91 ppb [7/15/91]            | 30 ppb [9/18/01]          |
| OW-201B          | < 0.5 ppb [6/9/92]         | 56 ppb [12/9/97]            | 28 ppb [9/17/01]          |
| MW-507A          | < 0.5 ppb [3/29/00]        | 81 ppb [12/9/97]            | 36 ppb [9/18/01]          |

The RP contractor reported in the MOM Sampling and Analysis Quarterly Report, September 2001 that a Mann Kendall trend test was performed that indicated a statistically significant downward trend in the 1,4-dichlorobenzene concentrations in these wells (W&C 2001).

Well MW-106B flows under artesian conditions most of the year. As such, it provides an indication of the water quality of the bedrock groundwater migrating from the Site. Low levels of six VOC compounds are regularly detected at MW-106B and are reported to be generally decreasing or staying at relatively constant low levels. The levels of benzene and 1,4 dichlorobenzene are below target limits (W&C, 2001c).

Monitoring wells MW-507A and MW-508B were placed in the bedrock trough, which is the primary discharge pathway for groundwater from the upper portions of the Site. The concentrations of 1,4 dichlorobenzene have generally decreased below the ROD limit in MW-507A, although this limit was exceeded in the sample obtained in September 2001 during a period of drought. The bedrock concentrations of this compound observed in MW-508B are well below the ROD limit. (W&C, 2001c).

Groundwater monitoring using the existing 16 well monitoring network should continue on a semi-annual basis to check for decreasing trends in 1,4-dichlorobenzene concentrations.

TWA II Wells. The groundwater from the five wells in the TWA II Area have typically not been sampled because the oil in these wells would not give representative results of the dissolved

concentrations. The limited number for samples collected for VOC and PCB analysis were determined to not be representative of actual dissolved contaminants in the groundwater.

To date the MOM monitoring program (wells outside TWA II) has shown that groundwater meets the target cleanup goals at the perimeter of the Site, and at other locations shows decreasing trends for those compounds not yet at the target cleanup goal. Within the TWA II area, concentrations of PCBs, benzene, and 1,4-dichlorobenzene exceed 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. The TWA II area wells are the subject of an application for a TI waiver being sought by CMP. Future monitoring in the TWA II wells and surrounding area may change based on action taken on the TI waiver request.

### 6.4.3 Riggs Brook OU-3

Sediment monitoring has been conducted annually at Riggs Brook since 1996, and biota monitoring was conducted in 1997 and 2000. The six years of sediment sampling are summarized below. PCB concentrations have exceeded the 5 ppm trigger level in a few locations. PCB concentrations in biota have not exceeded the 2 ppm threshold level.

| Year | Results                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1996 | Concentrations of total PCBs were below the 5 ppm trigger level at all sediment sample locations.                                                                                                                                                                                                                                                                                                                                       |
| 1997 | PCB concentrations exceeded 5 ppm at two sediment sample locations (8004 and 8013). More rigorous sampling was conducted and the sediment was remediated by excavating the two small hot spots.                                                                                                                                                                                                                                         |
| 1998 | PCB concentrations exceeded 5 ppm at two sampling locations (8006 and 3018).                                                                                                                                                                                                                                                                                                                                                            |
| 1999 | PCB concentrations at sample location 8006 continued to exceed 5 ppm but were lower than 1998 concentrations. The PCB concentration at sample location 3018 was below the trigger level in 1999.                                                                                                                                                                                                                                        |
| 2000 | PCB concentrations at sample location 8006 continued to exceed 5 ppm but decreased from 1999 concentrations. PCBs at sample location 3018 stayed below the trigger level. USEPA requested that additional sediment samples be collected in the area between the former Source Control area (OU-1) and Riggs Brook. Of these additional samples, concentrations of PCBs exceeded the trigger level of 5 ppm at four out of 51 locations. |
| 2001 | PCB concentrations at sample location 8006 dropped below the 1 ppm cleanup level. PCBs at sample location 3018 were slightly above the trigger level (6.1J ppm). The four additional locations where exceedances were observed in 2000 were sampled again in 2001, and the concentrations were below 5 ppm at all four locations.                                                                                                       |

Source: W&C 2001e

The supplemental sampling grid established by USEPA in 2000 showed the four exceedances of the Riggs Brook 5 ppm PCB trigger level mentioned in the table above, as well as two exceedances of the Source Area 1 ppm PCB target level. The PCB concentrations were 1.4 and 3.8 ppm at the two Source Area 1 locations on the slope downgradient of the lower lagoon (W&C, 2001b). According to the RP contractor, these two locations have not been re-sampled since 2000.

## **6.5 Site Inspection**

A site inspection was conducted on May 22, 2002 with representatives from EPA, MEDEP, CMP, EPA's contractor and CMP's contractor. The inspection included a site walkover focusing on the Designated Area boundary and observations of the vegetated cover, monitoring wells, restored wetland areas, the upland marsh and Riggs Brook area. The Site is no longer secured with fencing and not all of the monitoring wells have secure locks. In 1997, the fence was determined to be 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 is well established, swales constructed to direct runoff from the lagoons toward Riggs Brook are in good repair. The Site inspection report, including site photos, is included in Appendix B.

CMP staff check the Site frequently and stated that while the Site is not routinely mowed, mowing will be performed if required for access to wells and for ongoing operations. Since the Site was farmland in the 1950's the perimeter trees and other vegetation have become well-established in areas where there were no active operations. Many birds were heard and seen during the walkover.

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 covered in the Declaration of Restrictive Covenant signed by MEDEP and CMP and held in escrow by MEDEP. CMP and the RP contractor reported that there have been no known violations of the terms of the Covenant.

## **6.6**            **Interviews**

General discussions and observations were documented during the site inspection on May 22, 2002. Telephone interviews were conducted with other individuals. All individuals contacted regarding the five-year review are shown in Appendix C.

Roy Koster, CMP, noted that CMP personnel visit the Site on a monthly basis and check the wells in the TWA II area for floating oil. When present, oil is collected using absorbent pads which are then taken to a CMP transfer facility in Augusta. CMP has no plans to develop the site; it was noted that most of the development in Augusta is on the west side of the Kennebec River.

Mr. Bill Bridgeo, Augusta City Manager, was contacted by telephone on June 3, 2002. He knew of the Site and its location but stated that no concerns about the Site have been brought to his attention over the past few years.

Mr. Horace Rodrigue was contacted by telephone on June 3, 2002. He stated that the parties responsible for the cleanup of the Site did a “superb job.” Mr. Rodrigue has observed all-terrain vehicles using the Site. He owns property directly across Route 17 from the Site and attributes his inability to sell it over the past 10 years to the property being across the street from a “dump” site.

Current land use and flood zone maps were obtained from the Augusta City Services office. Staff at the office were familiar with the location of the O’Connor Site but did not express any concerns about the activities that have been completed. The administrative record and site documents are available at the Lithgow Public Library in Augusta. Library staff indicated that few individuals have accessed the documents.

To date USEPA has received no response from the public following publication of the press release in May 2002.

## 7.0 TECHNICAL ASSESSMENT

The following sections evaluate the remedy based on its function in accordance with decision documents, its adherence to valid 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 along with current ARARs and TBCs are provided in Appendix D of this Report for reference.

### 7.1 **Question A: Is the Remedy Functioning as Intended by the Decision Documents?**

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

Remedial action performance and monitoring results. The information presented in the Final Source Control Remedial Action Report (W&C, 1998) shows that the Site was remediated in accordance with the requirements of the ROD (USEPA, 1989) as modified by the ESD (USEPA, 1994). The soil excavation and covering of the Designated Area with clean fill during the SCRA reduced public health and environmental risks from direct contact with contaminated soils and sediments, exposure to surface water, and reduced public health risk from inhalation of contaminated vapors. The site inspections 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. EPA, MEDEP, and CMP are finalizing an O&M plan to ensure the long-term integrity of the soil cover over the Designated Area. This plan will include the collection of shallow subsurface samples coincident with future five-year reviews to assess whether there are PCBs above the 1 ppm concentration in the soil cover.

Wetlands Construction Monitoring Reports completed by Smart Associates in 1998, 2000, and 2001 conclude that the Site is achieving project goals.

Operations and Maintenance Costs. Maintenance of the Site, including the gravel access road, soil cover on the Designated Area, and the restored wetlands has been effective. As discussed earlier in this report, minor erosion had occurred on the soil cover and the gravel road, and was repaired. The minor erosion that did occur was not deep, and did not affect the protectiveness of the remedy.

O&M costs are less than originally estimated because site repairs have been minimal (see Table 4-1). The O&M costs presented in Table 4-1 do not include the site inspections which are performed by CMP or the wetland monitoring performed by Smart Associates.

Opportunities for Optimization. Three measures for optimizing maintenance of the SCRA are suggested. First, it is proposed that on-site markers be installed to more clearly define the Designated Area. This would enable personnel conducting site inspections to see the boundaries of the Designated Area while walking around the Site.

Secondly, revision and agency approval of the O&M Plan to reflect current O&M practices is suggested. This plan will include the collection of shallow subsurface samples coincident with future five-year reviews to assess whether there are PCBs above the 1 ppm concentration in the soil cover.

The third optimization suggestion is to reevaluate Site institutional controls currently covered by the Declaration of Restrictive Covenant between the MEDEP and CMP. All parties, e.g. USEPA, MEDEP and CMP, should agree with the form and duration of institutional controls for the Site.

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

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 the MEDEP. The Declaration of Restrictive Covenant also requires that CMP maintain the property to ensure the ongoing adequacy of the remediation implemented under the Consent Decree. The implementation of institutional controls, even though the restrictive covenant is in escrow and is therefore not legally enforceable, 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 are provided in Appendix E. The RP contractor has reported that no activities have been observed on the Site that would have violated the institutional controls.

### 7.1.2 OU-2: Management of Migration

Remedial Action Performance and Monitoring Results. Review of relevant MOM documents and results of the quarterly and semi-annual groundwater monitoring indicates that the MOM remedy is functioning as intended except within the TWA II Area. As described earlier in this report, concentrations of PCBs and VOCs either meet ROD target cleanup goals or are trending downward, except in an upland area including and surrounding the TWA II Area. Although the SCRA was successfully completed, small amounts of residual oil, containing PCBs and VOCs, remain in fractures in the clay and to a limited extent in bedrock. However little movement of residual oil has been observed.

Groundwater remediation with the VER system and monthly passive oil recovery has removed approximately 85 gallons of residual oil from the TWA II wells since 1992, and about 27 gallons of that since the completion of the SCRA in 1997. Groundwater monitoring results indicate decreasing trends in concentrations of VOCs over the entire Site, including the TWA II Area.

Due to the fact that the remedy is not functioning as intended within the TWA II Area, a TI Evaluation Report supporting a TI waiver for the TWA II area has been submitted to USEPA for approval. This TI Report proposes a groundwater remedy that would be protective of human health and the environment and includes a request for a TI waiver from specific ARARs within an area established as the TI Zone. The proposed TI Zone 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 proposed TI Zone will be monitored to ensure that drinking water standards are met outside of the proposed TI Zone.

Operations and Maintenance/Costs. There have been no O&M costs for the MOM other than the water quality monitoring. No maintenance has been required for the wells. Based on information provided by the RP contractor, groundwater monitoring costs are approximately \$50,000 per year.

Opportunities for Optimization. The groundwater-monitoring network should be reevaluated and the locations and number of wells included in the network modified based on agreement by USEPA, MEDEP and CMP. It may be possible to reduce the number of wells routinely sampled based on a review of historical groundwater results.

The VER Phase III activities conducted in 2001 extracted approximately 19.8 gallons of oil from the TWA II wells, and primarily from the bedrock wells. This was the first time a vacuum had been applied directly to these wells. To determine if further amounts of oil can be extracted from these wells, the VER should continue to be applied to the TWA II wells annually during a period of low groundwater (probably later summer) and the recovery rate of oil tracked.

As previously stated, groundwater samples collected from observation wells in the TWA II Area are not representative of the actual dissolved contaminants in the groundwater. This is due to an oil emulsion that is often observed in these wells. Therefore, it is proposed that these wells continue to be observed for oil, but that they not be added to the MOM program at this time.

Indicators of Remedy Problems. As stated above, the indicator that the remedy is not functioning as intended in the TWA II Area is the residual oil observed in cracks in the clay that continues to be a source of PCBs and VOCs in groundwater at concentrations that exceed their respective cleanup levels. Groundwater in the TWA II area is the subject of an application for a TI waiver being sought by CMP. The application for a TI waiver is included in a TI Evaluation Report that has been submitted to USEPA for approval.

Implementation of Institutional Controls. The implementation of institutional controls, through the Declaration of Restrictive Covenant, has thus far prevented exposure to contaminated groundwater at the Site. A reevaluation of the form and duration of institutional controls by USEPA, MEDEP and CMP is suggested to ensure the integrity of the remedial measures conducted at the Site.

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

Remedial Action Performance and Monitoring Results. Review of documents related to, and sampling data obtained from, Riggs Brook sediment and biota, indicates that subsequent to PCB hot spot removal in 1997 the remedy is functioning as intended by the ROD and RSOW. Sediment sampling and analysis has been conducted annually since 1996, and biota sampling and analysis was conducted in 1997 and 2000.

Over the last six years PCB concentrations in sediment have exceeded the ROD cleanup goal of 1 ppm and sporadically exceeded the ROD 5 ppm trigger level in several locations. The

Mann-Kendall statistical trend analysis does not show any statistically significant trends. In 2001 there was one sediment sample location where PCBs exceeded 5 ppm (6.1 ppm), and one other location that exceeded 1 ppm. All the remaining sediment samples contained less than 1 ppm of PCBs. Continued monitoring has shown that over time the PCB concentrations have continued to decrease, and in most cases the concentrations have decreased until they are below the cleanup goal.

The results of the 1997 and 2000 biota sampling events have shown that PCB concentrations have not exceeded 2 ppm (the ROD threshold limit). According to the 2000 Sediment and Biota Monitoring Report, the small amount of PCBs detected in Riggs Brook sediment does not appear to be impacting biota since the PCB concentrations in biota from the 1997 and 2000 sampling events have remained consistent or slightly decreased (W&C 2001b). Although not found to be statistically significant, decreasing concentrations of PCBs have been found at most of the sediment sampling locations. Additionally, since the exceedances of the sediment trigger level do not appear to be impacting the biota, the remedy is functioning as intended.

Operations and Maintenance Costs. Since the remedial action for OU-3 is monitoring, there are no other operations or maintenance occurring at Riggs Brook. The costs of the hot spot remediation that was conducted in 1997 were included with the Source Control activities and have not been separately tracked. Based on information from the RP contractor, annual costs for Riggs Brook sediment sampling and analysis are approximately \$20,000.

Opportunities for Optimization. The possibility of decreasing the sampling locations has been discussed. However, given the transient nature of sediments, USEPA has decided to continue with the same monitoring program for the duration of the ROD-specified period (until 2006).

Indicators of Remedy Problems. Based on annual sediment and biota monitoring, there do not appear to be any indicators of remedy problems. Although PCBs have been detected each year in one or more sediment samples, the concentrations are only slightly exceeding the trigger level of 5 ppm at a few locations and overall concentrations of PCBs appear to be decreasing. In addition, concentrations of PCBs in sediment do not appear to be impacting biota (all samples less than the threshold level of 2 ppm).

Implementation of Institutional Controls. Institutional controls for the Site, described in OU-1, also apply to OU-3.

**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?**

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

Changes in Standards and TBCs. As a part of this five-year review, the ARARs presented in the ROD have been reviewed, and a review of current ARARs has been conducted. Due to the fact that SCRA has been completed, most ARARs for soil contamination cited in the ROD have been met.

There are no current chemical-specific ARARs that apply to soil contaminants at the Site. TBC guidance that was written following the 1989 ROD includes the 1990 USEPA *Guidance on Remedial Actions for Superfund Sites with PCB Contamination*, the 1994 USEPA *Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities*, and the 1997 MEDEP *Remedial Action Guidelines* (RAGs). The USEPA *Guidance on Remedial Actions for Superfund Sites with PCB Contamination* recommends soil action levels of 1 ppm for sites in residential areas and 10-25 ppm for sites in industrial areas. The USEPA *Revised Interim Soil Lead Guidance* recommends 400 ppm for lead in soils. The MEDEP RAGs for PCBs range from 2.2 to 8.1 ppm for residential, trespasser and adult worker guidelines. Benzo(a)pyrene is used as an indicator contaminant for cPAHs, and the RAGs range from 2 to 9 ppm. For lead, the RAGs range from 375 to 700 ppm.

These more recent guidance are less conservative than the ROD target cleanup goals of 1 ppm PCBs, 1 ppm cPAHs and 248 ppm lead used to remediate the areas of the Site outside the Designated Area. Although the target cleanup goals inside the Designated Area were 10 ppm PCBs, 10 ppm cPAHs and 248 ppm lead, the top 12 inches of soil on the Designated Area has concentrations of PCBs less than 1 ppm. Therefore, additional guidance written after the 1989 ROD does not affect the protectiveness of the SCRA completed at OU-1.

Changes in Exposure Pathways. Seven exposure scenarios were identified in the Endangerment Assessment (Clement, 1988), including three potential current exposures and

four potential future exposures. These exposures include contact by trespassers, recreational fishing, and potential future residential exposures. Land use at the Site has not changed and is not expected to change, and there are no additional routes of exposure.

Changes in Toxicity and Other Contaminant Characteristics. Although toxicity factors have changed for some of the chemicals, the cancer slope factors (CSFs) (formerly called cancer potency factors) have, in general, decreased. A decrease in a cancer slope factor indicates that potential risk from exposure to contaminants is lower than previously calculated. The contaminants with the greatest cancer risk potential at the Site were PCBs and cPAHs. CSFs for PCBs have been changed from  $7.0 \text{ (mg/kg/day)}^{-1}$  to  $7.7 \text{ (mg/kg/day)}^{-1}$ . Considering the concentrations of PCBs that are being detected on site, it is unlikely that this small change could adversely affect the protectiveness of the remedy. In addition, risk values for cPAHs, as evaluated by using benzo(a)pyrene, have been decreased, with the current oral CSF of  $7.3 \text{ (mg/kg/day)}^{-1}$  lower than the 1988 value of  $11.5 \text{ (mg/kg/day)}^{-1}$ . Therefore, the changes in toxicity of these compounds would not affect the outcome of the Endangerment Assessment because there is no notable change in the risk of cancer at the Site.

There have also been changes made to the Risk Reference Doses (RfDs) since the Endangerment Assessment. These values are used to quantify the risk associated with specific contaminants. The alterations made to the RfDs used to determine risk for this Site would not affect the protectiveness of the remedy. Of the seven contaminants for which RfDs were listed in 1988, three have not changed, two have increased slightly and one decreased by an order of magnitude. None of these were contaminants of concern in the ROD. Risk associated with non-carcinogenic PAHs was not calculated in the assessment. RfDs are now available for many of those compounds. Based on the low cleanup levels for the cPAHs and PCBs (which would potentially be co-located with the non-carcinogenic PAHs), cleanup of the non-carcinogenic PAHs is expected to have occurred during remediation.

Changes in Risk Assessment Methods. The only changes in risk assessment methods since the RI/FS are the manner in which lead is evaluated, the way in which risk to constituents in air is estimated, and the use of certain exposure estimates. None of these changes affect the protectiveness of the remedy.

Currently, lead exposures to children are modeled using the Integrated Exposure Uptake Biokinetic Model (IEUBK), available from USEPA. Federal standards for lead are currently set at 400 mg/kg for residential use, based on this model. Because the cleanup level established for lead in soil was 248 mg/kg, the cleanup goal is protective of potential future use of the Site.

The methods used to assess risk to constituents in air have changed. In addition, some of the default exposure assumptions have changed, specifically for dermal exposure, based on studies reviewed by USEPA. While these changes would have slight effects on calculated risks, there is no potential for exposure as long as the soil cover over the Designated Area is maintained and therefore the soils with less than 10 ppm PCBs are not accessible. The target cleanup goals set in the ROD remain protective of the exposures and receptors identified for the Site.

Expected Progress Towards Meeting RAOs. The SCRA was completed and met the remedial action goals for OU-1.

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

Changes in Standards and TBCs. The primary change to the ARARs list for groundwater is the addition of the 1992 Maine Maximum Exposure Guidelines (MEGs). The effect of this ARAR is the addition of five VOCs to the list of compounds in Site groundwater that have promulgated cleanup standards. There are also MCLs for three of these VOCs; however, their values are the same or higher than their respective MEGs. In addition, the 1992 MEG of 0.05 ppb PCBs is significantly lower than the 1989 ROD target cleanup goal of 0.5 ppb for PCBs. These MEGs were revised in 2000, and the MEG for PCBs was once again changed to 0.5 ppb, but these revisions have not been promulgated. According to the MEDEP, the 1992 MEGs are referenced in the Maine hazardous waste regulations, are enforceable and are therefore applicable to this Site. Therefore, for the purpose of this five-year review, the 1992 MEG for PCBs of 0.05 ppb is the applicable ARAR for groundwater. When the groundwater cleanup target goal for this Site was set at 0.5 ppb, the current MCLs and Maine MEGs were taken into consideration. Since these MEGs have become more strict since the ROD was issued, it may be necessary in the future to recalculate risk based on these new standards to ensure the protectiveness of the remedy.

Changes in Exposure Pathways. Although institutional controls are in place at the Site, and there are no plans to develop the Site for residential or commercial use, future residential use is protective of other receptors, including potential commercial workers and temporary construction workers. One pathway excluded from the Endangerment Assessment was exposure to volatiles in indoor air originating from shallow groundwater. A review of current groundwater data was conducted to determine whether this route of exposure is complete. In the areas of the Site that could be redeveloped (i.e., on more even terrain), shallow groundwater is primarily at a depth of 10 to 20 feet below ground surface. Concentrations of two VOCs, 1,2-dichlorobenzene (ranging from 9 to 93 µg/L) and 1,4-dichlorobenzene (ranging from 4 to 36 µg/L), have only slightly exceeded the ROD target cleanup goal and MEGs (27 µg/L and 85 µg/L, respectively), at one well (507A) in the shallow aquifer during the 2001 sampling. These concentrations are not expected to adversely impact indoor air in potential future buildings. Bedrock groundwater was not evaluated for this pathway, as shallow groundwater is the potential source for volatilization into indoor air. Based on the limited concentrations in shallow groundwater, the exposure pathways that were evaluated remain valid.

Changes in Toxicity and Other Contaminant Characteristics. As discussed for OU-1, although toxicity factors for some chemicals have changed, in general, the CSFs have decreased. The oral CSF for 1,4-dichlorobenzene, PCBs and benzene are  $2.4 \text{ E-}2 \text{ (mg/kg/d)}^{-1}$ ,  $7.7 \text{ (mg/kg/d)}^{-1}$  and  $2.90 \text{ E-}2 \text{ (mg/kg/d)}^{-1}$ , respectively. The oral RfD (for non-cancer outcomes) for PCBs is  $2.00\text{E-}5 \text{ (mg/kg/d)}^{-1}$ . The RfD for benzene and 1,4-dichlorobenzene were not assessed under the EPA's Integrated Risk Information System (IRIS). The inhalation toxicity factor for 1,4-dichlorobenzene is  $8.0 \text{ E-}1 \text{ mg/m}^3$ . This value was not in the original assessment, nor was it published for benzene or PCBs in IRIS. For all three of these contaminants, the CSFs referenced in the Endangerment Assessment have since been changed, however only PCBs now have a higher CSF. Only one of the above contaminants has been detected in groundwater outside the Designated Area, and the target cleanup goal for 1,4-dichlorobenzene is lower than the MEG. Additionally, the concentrations in the shallow groundwater are below or very close to the MEG. Review of this information indicates that the remedy remains protective.

Changes in Risk Assessment Methods. Since the target cleanup levels for groundwater were based on MCLs and MEGs, changes in risk assessment methods would be accounted for because MCLs and MEGs use conservative default assumptions and are updated periodically.

Expected Progress Towards Meeting RAOs. A TI waiver has been requested for a portion of the Site groundwater, referred to as the TI Zone (including and surrounding the TWA II Area), where concentrations of VOCs (e.g., benzene, 1,4-dichlorobenzene) and PCBs exceed the ROD target cleanup goals and current ARARs. USEPA has indicated the TI waiver will be part of a ROD amendment that is expected to be signed in September 2002. In the past 14 MOM sampling events, neither benzene nor PCBs have been detected in wells downgradient of TWA II. Additionally, the concentrations of 1,4-dichlorobenzene show a statistically significant downward trend.

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

Changes in Standards and TBCs. Guidance for sediment written after 1989 include sediment quality criteria published by the National Oceanic and Atmospheric Administration (NOAA), the Ontario Canada Ministry of Energy, USEPA and Oak Ridge National Laboratory. These criteria are included in Appendix D as TBCs. Although these sediment criteria are more conservative than the ROD target cleanup goal of 1 ppm, at the time of the ROD, the USEPA, U.S. Fish and Wildlife Service and NOAA agreed that the potential for irreversible environmental damage caused by sediment excavation to achieve the cleanup goal of 1 ppm outweighed the disadvantages of leaving contaminated sediments in place. Therefore, the ROD set a trigger level of 5 ppm which, if exceeded, would require more rigorous sampling to determine the need, if any, for further remedial action.

Changes in Exposure Pathways. Land use in the Riggs Brook area has not changed and is not expected to change, and there are no additional routes of exposure.

Changes in Toxicity and Other Contaminant Characteristics. The major contaminant that has been historically detected in Riggs Brook sediments is PCBs. The current cancer slope factor for this contaminant is  $7.7 \text{ (mg/kg/d)}^{-1}$ . The original cancer slope factors for PCBs referenced in the Endangerment Assessment was  $7.0 \text{ (mg/kg/d)}^{-1}$ . Although this is a slight increase in the cancer risk posed by exposure to PCBs, monitoring is on-going in Riggs Brook, and overall concentrations of PCBs seem to be decreasing.

Changes in Risk Assessment Methods. Since the ROD was written in 1989, there have been some changes to the risk assessment methods for sediments. The major change involved

dermal exposure assumptions. However, since Riggs Brook is rarely used for recreation, and since the levels of contaminants detected in sediments are fairly low and the exposure assumptions made in the Endangerment Assessment were conservative, the remedy still remains protective.

Expected Progress Towards Meeting RAO. There have been periodic exceedances of the 5 ppm trigger level for PCBs in Riggs Brook sediment since sampling began in 1996. Supplemental sampling was undertaken to determine the extent of sediment with these higher levels. The extent of the exceedances was found to be very limited. In 2001, concentrations of PCBs slightly exceeded the target level at one location, and were less than 1 ppm at all remaining locations. Concentrations of PCBs in biota were below the target level of 2 ppm in both the 1997 and 2000 sampling events.

### **7.3 Question C: Has Any Other Information Come To Light That Could Call Into Question The Protectiveness Of The Remedy?**

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

The OU-1 SCRA was completed with the covering of the Designated Area where soils with less than 10 ppm PCBs were consolidated, and the subsequent reestablishment of vegetation. Therefore, Site soils are not accessible so there is no potential for exposure. Since no new ecological targets were identified during the five-year review, the monitoring of ecological targets is not necessary. No other information has been discovered that would call into question the protectiveness of the remedy.

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

The main issue in OU-2 is the TI Waiver being sought for the Designated Area. Currently, concentrations of Site contaminants exceed both ROD target clean-up goals and current ARARs. However, since a TI Waiver is currently being sought to provide reprieve from these standards, at the time of this five-year review the protectiveness of the MOM remedy should not be called into question. No other information has been discovered that would call into question the protectiveness of the remedy.

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

The remedy selected for Riggs Brook consisted of the monitoring of contaminants in sediments. There have been exceedances of clean-up goals for OU-3; however, ecological risks have been adequately addressed and there is on-going biota monitoring scheduled for Riggs Brook. While this area is mapped as a Zone A flood hazard area, it has not been affected by any flooding or other weather-related events and no other information has been discovered that would call into question the protectiveness of the remedy.

## **7.4 Technical Assessment Summary**

According to the data reviewed, the site inspection, and the interviews, the remedy is functioning as intended by the ROD, as modified by the ESD. There have been minor changes to the physical conditions of the site, caused by erosion, but these changes do not affect the protectiveness of the remedy. Most ARARs for soil, groundwater or sediment contamination have been met. There have been some changes in toxicity factors, most notably the increase in the CSF for PCBs, but the changes have not been significant enough to effect the original determination of risk in the ROD. Additionally, there have been no changes to the standardized risk assessment methodology that could affect the protectiveness of the remedy. Finally, there is no other information for any of the OUs that calls into question the protectiveness of the remedy.

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

The SCRA 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. Additionally, O&M costs have remained lower than original estimates. Most 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 have emerged. Although some toxicity values for contaminants on Site have changed, the change would not impact the outcome of the original Endangerment Assessment since there would be no significant change

in cancer risks at the Site. With the completion of the SCRA, the remedial action goals 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, with the exception of the TWA II Area where PCBs and VOCs exceed their cleanup limits. There have been no additional O&M costs beyond the original scope of work. The Declaration of Restrictive Covenant, that is being held in escrow by the MEDEP, prevents exposure to contaminated Site groundwater. The one significant change in standards affecting the status of OU-2 is the change in the MEG for PCBs. This change decreased the MEG by one order of magnitude, therefore making it more conservative than the Site clean-up goal established in the ROD.

One new potential exposure pathway identified since the ROD is the indoor pathway that would exist if buildings were constructed on-site. However, there are currently no plans for any on-site construction and all previously identified pathways remain valid.

There were some changes in toxicity data for Site contaminants, however only the CSF for PCBs indicates a slightly greater risk of cancer than previously determined. Since the change is insignificant, 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. During the most recent round of sediment sampling conducted in 2001, concentrations of PCBs slightly exceeded the trigger level, reaching 6.1 ppm at one location, and were less than the 1 ppm target cleanup goal at all remaining locations. Concentrations of PCBs in biota were below the threshold level of 2 ppm in both the 1997 and 2000 sampling events.

There are several TBC documents that were reviewed for this report that provide guidance in establishing sediment standards. Although there have been exceedances of the 5 ppm trigger

level, it was determined by the EPA, the U.S. Fish and Wildlife Service and NOAA that leaving contaminated sediments in place would cause less harm to the ecosystem than performing an excavation. As with the other OUs, the change in the CSF for PCBs would slightly alter the risk values for sediments, however not enough to alter the protectiveness of the remedy.

## 8.0 ISSUES

As discussed previously, the groundwater in the TWA II area of the Site is being impacted by residual oil and is not achieving the groundwater cleanup goals. A request for a TI waiver is currently under review by the EPA and MEDEP. Therefore, the OU-2 remedy as currently constituted is not protective. Groundwater in other portions of the Site is showing decreasing trends in target cleanup levels.

While there may be opportunities to optimize OU-1 O&M activities and OU-3 annual sampling activities, the remedies are currently protective and are expected to continue to be protective in the future.

The Riggs Brook sediments do not consistently meet the target cleanup goal. The annual sediment-monitoring program is planned to continue until 2006. As part of the five-year review process, MEDEP has expressed concerns that the target cleanup goal of 1 ppm for the Riggs Brook sediment set in the 1989 ROD may not adequately address ecological risk. MEDEP also now disagrees with the statement that sediment excavation would cause irreversible damage to the Riggs Brook wetlands.

The change in ARARs for OU2, specifically the promulgation of the 1992 MEG for PCBs is an issue that should be addressed. The 1992 MEG (0.05 ppb) is significantly lower than the 1989 ROD target clean-up goal of 0.5 ppb for PCBs. Although it may not affect the overall protectiveness of the remedy, the 1992 MEGs for PCBs remain enforceable. Therefore a reevaluation of the OU-2 target level for PCBs in groundwater is warranted. The reevaluation would serve as an assurance that the cleanup goal for PCBs remains protective of human health and the environment.

Two locations in the Source Control area included in the 2000 sediment sampling grid exceeded the 1 ppm PCB cleanup level. Since this portion of the Site was not covered with 12 inches of clean soil, these locations should be resampled during the 2002 Riggs Brook sediment monitoring event to assess the potential for exposure.

There is presently no agency-approved O&M Plan. An updated Plan is being prepared by CMP.

The 0.2-acre shortfall in post-restoration wetland area is an issue that will be closely monitored during the years 5 and 10 events. This does not affect the current protectiveness of the remedy.

Restrictions on groundwater use at the Site should be reevaluated as a result of the TI waiver.

## 9.0 RECOMMENDATIONS AND FOLLOW-UP ACTIONS

The approval of the PRP's TI Waiver will result in revision the ARARs for OU-2 and a modification of the remedy via a ROD amendment. This process is currently underway by USEPA with the support of MEDEP. This and other issues and actions required are summarized in the table below.

| Issue                                            | Recommendations/<br>Follow-up Actions                                                    | Party<br>Responsible | Oversight<br>Agency | Milestone<br>Date | Affects<br>Protectiveness?<br>(Y/N) |        |
|--------------------------------------------------|------------------------------------------------------------------------------------------|----------------------|---------------------|-------------------|-------------------------------------|--------|
|                                                  |                                                                                          |                      |                     |                   | Current                             | Future |
| OU-2 Cleanup goals not achievable in TWA II area | Implement necessary regulatory changes to the remedy for OU-2                            | EPA                  | State               | September 2002    | Y                                   | Y      |
| PCB MEG (0.05 ppb)                               | Analyze groundwater at lower DL to determine if remedy meets the PCB MEG                 | CMP                  | State/EPA           | September 2002    | N                                   | N      |
| SC sample exceedance of 1 ppm PCB level          | Resample the two locations from the 2000 EPA grid                                        | CMP                  | State/EPA           | Fall 2002         | N                                   | N      |
| O&M Plan                                         | Update O&M Plan, obtain agency approval                                                  | CMP                  | State/EPA           | Summer 2002       | N                                   | N      |
| Shortfall in restored wetland area               | Regulatory oversight of year 5 and 10 events                                             | CMP                  | State/EPA           | 2007              | N                                   | N      |
| Restrictions on future groundwater use           | Reevaluate the Institutional Controls and restructure to reflect current Site conditions | EPA/State            | CMP                 | September 2002    | Y                                   | Y      |

## **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. The finalization of the O&M plan will ensure that the OU-1 remedy will remain protective.

OU-2 : The remedy at OU-2 is not protective in the TWA II area of the Site and surroundings defined as the TI Zone in the TI Waiver due to the presence of residual oil in the subsurface and PCB and VOC concentrations that can not meet target cleanup levels. Actions now underway to implement the TI Waiver are needed to ensure protectiveness.

OU-3 : The remedy at OU-3 is expected to be protective of human health and the environment upon completion of the 10-year sampling program. In the interim, exposure pathways that could result in unacceptable risks are being monitored. The annual sediment monitoring, which began in 1996, has found periodic and isolated exceedances above the 5 ppm trigger level. Additional sampling and hot spot excavation in 1997 indicated that the exceedances are limited areally and over time. The biota sampling has indicated that the remedy for OU-3 is protective of human health, and with the anticipated continued decrease in dissolved PCB concentrations in the discharging groundwater, the remedy is expected to remain protective of human health.

## **11.0           NEXT REVIEW**

A second five-year review for the O'Connor Site will be conducted in 2007.