

**REMEDIAL INVESTIGATION OF CONTAMINATED SEDIMENTS IN THE
EIGHTEENMILE CREEK SOURCE AREA OF CONCERN
NIAGARA COUNTY, NEW YORK**

PREPARED FOR: USEPA-GLNPO
PREPARED BY: NIAGARA COUNTY SOIL & WATER CONSERVATION DISTRICT
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SECTION 1: PROJECT MANAGER INFORMATION

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SECTION 2: EXECUTIVE SUMMARY

The purpose of this project is to further evaluate contamination in Eighteenmile Creek sediments. The specific objectives of this investigation are to:

- Further evaluate the nature and extent of Poly Chlorinated Biphenyls (PCBs), Chlorinated Pesticides (DDT & DDE), PCDD/Fs, Chromium, Copper, Lead, Manganese, Nickel, Cyanide, Zinc and Mercury contamination in Eighteenmile Creek sediment to provide comprehensive data relevant to the migration of contaminants from upstream source areas. (\$575,000: Legacy Act Contribution)
- Develop and conduct a remedial alternatives analysis for the remediation of contaminated sediments within the source area of the Eighteenmile Creek AOC. (\$74,000: Legacy Act Contribution)
- Commence with the Eighteenmile Creek Protection Program within the source Area of Concern (watershed). The program consists of the completion of a Feasibility Study for the Eighteenmile Creek Corridor Site, various site investigations, and operation maintenance and monitoring activities at a number of identified source areas. (\$226,171.61: In Kind Contribution)

This project is intended to provide the information needed to assess the migration and further define the nature and extent of contaminants from upstream source areas. Clarifying the contamination that exists will greatly enhance the government's ability to eliminate these contaminants and their effects on the impact AOC, source AOC watershed and the public. Defining and inevitably reducing the contamination in Eighteenmile Creek will directly:

- Support regional Eighteenmile Creek watershed and AOC restoration efforts.
- Reduce the risk to human health and the environment.
- Restore Eighteenmile Creek's beneficial uses by improving sediment quality.

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SECTION 4: PROJECT DESCRIPTION NARRATIVE

4.1 PART I – PROJECT TITLE

Remedial Investigation of Contaminated Sediments in the Eighteenmile Creek Source Area of Concern, Niagara County, New York.

4.2 PART II – OVERALL OBJECTIVES

1. Conduct sediment sampling within upper (source area) Eighteenmile Creek, beginning just downstream of Old Stone Road and ending just upstream of the Burt Dam, having the samples analyzed for PCBs, DDT, PCDD/Fs, Chromium, Copper, Lead, Manganese, Nickel, Cyanide, Zinc and Mercury.
2. Develop and conduct a remedial alternatives analysis for the remediation of contaminated sediments within the source area of the Eighteenmile Creek AOC.
3. Commence with the Eighteenmile Creek Protection Program within the source Area of Concern (watershed). The program consists of the completion of a Feasibility Study for the Eighteenmile Creek Corridor Site, various site investigations, and operation maintenance and monitoring activities at a number of identified source areas.

4.3 PART III – JUSTIFICATION

4.3.1 CURRENT CONDITIONS

The Eighteenmile Creek Remedial Action Plan (RAP) has identified three beneficial use impairments (BUIs) for Eighteenmile Creek. Furthermore, a BUI assessment conducted in 2007 identified three additional BUIs. All six of these BUIs have identified contaminated sediments as being the known or likely source. The impaired beneficial uses include:

- Restrictions on Fish & Wildlife Consumption
- Fish Tumors and Other Deformities
- Degradation of Benthos
- Restrictions on Dredging

- Degradation of Fish & Wildlife Populations
- Bird or Animal Deformities or Reproductive Problems

4.3.1A CHEMICAL CONCENTRATIONS

The most recent sediment chemistry data relevant to the lower reach of Eighteenmile Creek (Impact AOC) was collected in 2003, as part of the U.S. Army Corps of Engineers study entitled, *Concentrations, Bioaccumulation and Bioavailability of Contaminants in Surface Sediments - Eighteenmile Creek Great Lakes Area of Concern (AOC)Niagara County, New York*. (An electronic copy of this report is included with this RFP as Appendix A). The sampling results are summarized in the two charts below.

Heavy metals data indicated that concentrations of various metals in surficial sediments, particularly copper, chromium, lead, nickel and zinc, may exert chronic toxicity throughout the impact AOC. Potential for sediment-associated lead and zinc toxicity was consistent throughout the AOC. Organic contaminant data indicated that levels of the pesticide dichlorodiphenyldichloroethylene (DDE) in surficial sediments may be chronically toxic. Bioaccumulation data indicated that DDE was bioavailable throughout impact AOC surface sediments (mean BSAF range = 1.21 to 5.41). The high bioavailability of DDE in surficial sediments indicate that it is bioaccumulating in benthic invertebrates, and is likely to bioaccumulate in predator fish and higher trophic levels.

PCB concentrations are bioavailable in surface sediments throughout the AOC (mean BSAF range = 1.55 to 4.36). The high bioavailability of PCBs in the surficial sediments indicate that they are bioaccumulating in benthic invertebrates, and are likely to bioaccumulate in predator fish and higher trophic levels. PCDD/F contamination in surficial sediments throughout the AOC indicate a bioaccumulation risk to wildlife. The results of this investigation indicate

that surficial sediments throughout the AOC contain levels of contaminants that should be of toxicological concern.

CONCENTRATIONS OF HEAVY METALS IN AOC REACH SURFICIAL COMPOSITE SEDIMENT SAMPLES, AND IN CORRESPONDING OLIGOCHAETE TISSUES. ALL UNITS ARE IN MG/KG

Heavy Metal	AOC Reach									
	EBU1		EBU2		EBU3		EBU4		EBU5	
	Sediment	Mean Tissue	Sediment	Mean Tissue	Sediment	Mean Tissue	Sediment	Mean Tissue	Sediment	Mean Tissue
Aluminum	10,800	292	12,800	422	11,600	409	12,800	585	10,700	632
Antimony	0.35	0.03	0.45	0.07	0.56	0.07	2.97	0.05	0.33	0.06
Arsenic	3.4	0.89	4.13	1.24	3.75	1.25	3.38	1.07	2.78	0.88
Barium	113	45.3	137	57.9	122	68.7	122	69.7	65.8	63.0
Beryllium	0.52	0.04	0.68	0.04	0.60	0.05	0.63	0.05	0.60	0.04
Cadmium	0.75	0.15	1.25	0.35	1.52	0.32	0.90	0.16	0.36	0.14
Calcium	20,000	1,781	14,300	1,079	10,400	1,164	19,200	1,791	12,900	1,358
Chromium	41	5.2	74.1	7.8	109	15.7	52.5	11.6	102	11.1
Cobalt	8.77	0.95	12.1	1.20	13.9	1.76	12.3	1.29	11.8	0.62
Copper	64.7	9.8	123	15.6	157	25.4	73.5	15.7	31.7	7.3
Iron	21,200	1,023	25,900	1,728	25,400	1,914	27,600	2,160	23,400	1,362
Lead	102	7.1	146	16.4	203	29.9	153	21.4	69.9	11.6
Magnesium	6,270	337	6,820	356	6,380	403	6,410	387	6,770	342
Manganese	535	41.5	409	24.4	475	40.0	517	42.6	440	34.7
Mercury	0.17	2.37	0.33	0.11	0.37	0.17	0.17	0.07	0.04	0.03
Nickel	31.2	4.7	56.9	8.5	20.5	20.3	47.9	5.3	39.9	2.9
Selenium	0.50	0.46	0.45	0.48	3.53	0.34	0.32	0.42	0.10	0.30
Silver	0.47	0.01	0.62	0.02	0.62	0.04	0.34	0.03	0.18	0.09
Sodium	187	628	180	661	158	589	186	670	463	547
Thallium	0.20	0.06	0.29	0.03	0.29	0.04	0.24	0.02	0.13	0.02
Vanadium	20.8	1.39	25.3	1.72	24.5	2.32	23.5	2.13	20.5	1.53
Zinc	328	70.0	536	102	800	173	444	93.1	238	93.1

TOTAL PCB CONCENTRATIONS IN AOC REACH SURFACE SEDIMENTS AND THEIR ASSOCIATED BIOAVAILABILITY

AOC reach	Total concentration (µg/kg)	EqP-derived Sediment Criterion (µg PCB/kg sediment)	Mean BSAF
EBU1	236	46.2	1.76
EBU2	229	54.6	1.55
EBU3	279	50.4	2.95
EBU4	278	43.4	1.91
EBU5	77.9	40.6	4.36
MEAN AOC BSAF			2.51
*Shaded areas indicate values that exceed the respective EqP-based sediment criterion for wildlife bioaccumulation.			

DDD, DDE, DDT AND Σ DDT CONCENTRATIONS IN AOC SURFACE SEDIMENTS

AOC Reach	Concentration ($\mu\text{g}/\text{kg}$)			Σ DDT Concentration ($\mu\text{g}/\text{kg}$)	EqP-derived Sediment Criterion (μg DDE/kg sediment)
	DDD	DDE	DDT		
EMC-1	3.22	<2.22	<2.22	7.67	11
EMC-2	<3.36	17.4	<3.36	24.1	32
EMC-3	<4.87	33.3	<4.87	27.1	47
EBU1	<3.61	16.2	<3.67	23.5	33
EMC-4	<4.40	27.9	<4.40	36.7	45
EMC-5	<3.97	25.8	<3.97	33.7	44
EMC-6	<3.18	16.3	<3.18	22.3	30
EBU2	<3.83	22.5	<3.83	30.2	39
EMC-7	<3.71	6.75	<3.71	14.2	35
EMC-8	<3.36	29.2	<3.36	35.9	36
EMC-9	<3.39	20.0	<3.39	26.8	30
EBU3	<3.64	14.1	<3.64	21.4	36
EMC-10	<3.03	11	<3.03	17.1	24
EMC-11	<2.76	9.75	<2.76	15.3	32
EMC-12	13.7	37.3	<4.88	55.9	48
EBU4	10.7	22.7	<3.52	40.0	31
EMC-13	<3.24	3.24	<3.24	9.72	32
EMC-14	<2.42	6.65	<2.42	11.5	18
EMC-15	10.4	16.2	<3.50	30.1	45
EBU5	<2.63	4.07	<2.63	9.33	29

*Shaded areas indicate values that exceed the respective EqP-based sediment criterion for wildlife bioaccumulation

During the Fall of 2005 the NYSDEC completed a Remedial Investigation (RI) of the Eighteenmile Creek Corridor Site (source AOC) to better define the nature and extent of sediment contamination for the purpose of evaluating remedial alternatives, to further evaluate the impact of creek flooding on residential properties along Water Street and to evaluate potential sources of contaminants to the creek. (Appendix B) These sources include the Former Flintkote Plant Site, the White Transportation property, the former United Paperboard Company property and Upson Park.

PCBs were detected in fifty-eight of sixty-one samples at concentrations ranging from 7.0J to 1,400,000 $\mu\text{g}/\text{kg}$. The principal aroclors detected were 1248, 1254 and 1260. Aroclor 1242 was also detected in several samples. Thirty-eight of the samples contained PCBs at concentrations that exceeded the NYSDEC sediment criterion (606.0 $\mu\text{g}/\text{kg}$) for chronic toxicity to benthic aquatic life. The majority of these samples (31) also exceeded the NYSDEC TAGM

4046 surface soil cleanup objective (1,000 µg/kg). Additionally, 7 samples at 4 locations contained PCBs at concentrations that exceeded the 50 mg/kg hazardous waste criterion.

PCBs were also detected in sediment from the New York State Barge Canal immediately upstream of Eighteenmile Creek, and in fill material from Upson Park. Contaminated sediment and fill, therefore, have the potential to adversely impact Eighteenmile Creek.

Copper was detected in all fifty-seven sediment samples analyzed for copper at concentrations ranging from 20.5 to 7,900 mg/kg. Thirty-six of these samples contained copper at concentrations that exceeded the NYSDEC sediment criterion (110.0 mg/kg) for the severe effect level. Copper was also detected in sediment from the New York State Barge Canal immediately upstream of Eighteenmile Creek, and in fill material from Upson Park, the White Transportation property, the former United Paperboard Company property and the Former Flintkote Plant Site. The concentrations of copper at all of these sites are higher than the NYSDEC sediment criterion for the severe effect level, suggesting that these sites have the potential to adversely impact Eighteenmile Creek.

Lead was detected in all sixty-one sediment samples analyzed for lead at concentrations ranging from 15.3 to 25,400 mg/kg. Fifty-six of these samples contained lead at concentrations that exceeded the NYSDEC sediment criterion (110.0 mg/kg) for the severe effect level. Lead was also detected in sediment from the New York State Barge Canal immediately upstream of Eighteenmile Creek, and in fill material from Upson Park, the White Transportation property, the former United Paperboard Company property and the Former Flintkote Plant Site. The concentrations of lead at all of these sites are higher than the NYSDEC sediment criterion for the severe effect level, suggesting that these sites have the potential to adversely impact Eighteenmile Creek.

Zinc was detected in all fifty-seven sediment samples analyzed for zinc at concentrations ranging from 37.1 to 23,600 mg/kg. Thirty-seven of these samples contained zinc at concentrations that exceeded the NYSDEC sediment criterion (270.0 mg/kg) for the severe effect level. Zinc was also detected in sediment from the New York State Barge Canal immediately upstream of Eighteenmile Creek, and in fill material from Upson Park, the White Transportation property, the former United Paperboard Company property and the Former Flintkote Plant Site. The concentrations of zinc at all of these sites are higher than the NYSDEC sediment criterion for the severe effect level, suggesting that these sites have the potential to adversely impact Eighteenmile Creek.

4.3.1B FISH CONTAMINANT LEVELS

The NYS Department of Health has issued the following fish consumption advisories for Eighteenmile Creek, upstream of the Burt Dam (source AOC).

- Eat no fish of any species from Eighteenmile Creek (due to PCB contamination)
- Women of childbearing age and infants and children under the age of 15 should not eat any species from Eighteenmile Creek.

Since fish from Lake Ontario populate the area below Burt Dam (Impact AOC), the consumption advisory for Lake Ontario would apply. The advisory for Lake Ontario and the Eighteenmile Creek Impact AOC is:

- Eat no American eel, channel catfish, carp, lake trout, chinook salmon, rainbow trout, white perch, coho salmon over 21 inches or brown trout over 20 inches. Also, no more than one meal per month of white sucker, coho salmon under 21 inches, and brown trout less than 20 inches should be eaten.
- Women of childbearing age and infants and children under the age of 15 should not eat any species.

The latest fish contaminant sampling data available for Eighteenmile Creek above Burt Dam (Source AOC) was collected in 1994. All of the fish samples from above Burt Dam

exceeded the Food and Drug Administration (FDA) limit for human consumption of 2 mg/kg for PCBs (2.31 - 15.3 mg/kg). Of the fish analyzed for dioxins, two whole fish samples exceeded the NYS guideline concentration of 0.00001 mg/kg with concentrations of 0.0000432 mg/kg and 0.000012 mg/kg. (NYSDEC. 1997)

The latest fish contaminant sampling data available for Eighteenmile Creek below Burt Dam (Impact AOC) was collected in August 2007. All fish samples collected from Eighteenmile Creek below Burt Dam that were analyzed for total PCBs exceeded the Food and Drug Administration (FDA) limit for human consumption of 2 mg/kg for PCBs and exceeded the critical tissue concentration limit of .440 mg/kg (Dyer et al. 2000) with results in the range of 0.890 mg/kg to 6.10 mg/kg. (E&E. 2008)

4.3.1C ROUTES OF EXPOSURE

Potential routes of exposure to humans are primarily through direct contact with the sediments and possible ingestion of surface water through recreational activity as well as consumption of the fish. Due to the bioaccumulative nature of most of the constituents of potential concern in Eighteenmile Creek, the fish consumption pathway would likely involve the greatest exposures to humans. Potential routes of exposure to aquatic life include direct contact with surface water and sediments, as well as exposure via their diet. Wildlife may also have limited direct contact with surface water and sediments, but the main route of exposure for wildlife will be through the food chain, with bioaccumulative constituents giving the greatest likelihood of exposure to wildlife.

4.3.2 POTENTIAL OUTCOME OF OBJECTIVES

Objective 1: Conduct sediment sampling within the upper section (source area) of Eighteenmile Creek, beginning downstream of Old Stone Road and ending just upstream of the Burt Dam.

The sediment data collected in this study will be used to define the nature and extent of sediment contamination within Eighteenmile Creek and determine the extent of contaminant migration from upstream source areas. In addition, the analysis of surface-sediments sampled from the creek will determine the potential for recontamination of down stream areas (Impact AOC).

Objective 2: Develop and conduct a remedial alternatives analysis for the remediation of contaminated sediments within the source area of the Eighteenmile Creek AOC.

Remedial alternatives will be developed along with remedial action objectives (RAOs) for the source AOC. These RAOs will be coordinated and consistent with those being developed for the Eighteenmile Creek Corridor Site scheduled to be completed under Objective 3. Remedial alternatives to be analyzed include, but are not limited to:

- No Action
- Institutional Controls
- Natural Attenuation with Ongoing Monitoring
- Dredge and Offsite Disposal
- Dredge and Place in a CDF
- In-situ Capping

The proposed alternatives will be compared against the following nine criteria and a comparative matrix will be provided to rank the alternatives:

- Overall protectiveness of human health and the environment
- Compliance with applicable or relative and appropriate requirements
- Long-term effectiveness and permanence
- Reduction in toxicity, mobility or volume through treatment
- Short-term effectiveness and environmental impacts

- Implementability, both technical and administrative
- Cost
- Acceptance by NYSDEC and EPA
- Stakeholder acceptance

Objective 3: Commence with the Eighteenmile Creek Restoration Program

The NYSDEC will conduct the Eighteenmile Creek Restoration Program within the source AOC (watershed). Outcomes of the program will include a Feasibility Study for the Eighteenmile Creek Corridor Site and site investigations for the sites identified as the Dussault Foundry, Old Upper Mountain Road Site, Upson Park and White Transportation. Operation maintenance and monitoring activities will also be completed at a number of identified source areas within the source AOC.

4.4 PART IV – APPROACH AND METHODS

4.4.1 REMEDIAL INVESTIGATION

The purpose of the remedial investigation is to further determine the location, nature and extent of contamination in Eighteenmile creek sediments. The investigation will also determine the extent of contaminant migration from upstream source areas. In order to obtain a full picture of the contamination present within the project area, a large number of samples need to be collected. To defray the substantial costs associated with sampling and analysis, a modified laboratory screening procedure or immunoassay test kit will be used to screen 200 preliminary sediment core samples. Screening samples will quantify a total concentration of PCBs and heavy metals at a depth of 18 inches. All screening samples will also be analyzed for percent solids. These samples will allow project personnel to determine the levels of contaminants present in the sediments and further lead to pinpointing possible areas of contaminated sediment negatively impacting the downstream impact AOC. The collection of preliminary screening samples will

begin just downstream of Old Stone Road and continue to a location just upstream of the Burt Dam. Figure 1 presents an overview of the project area. Sampling will begin at Old Stone Road because the creek upstream of this location has already been investigated under a project entitled, EighteenmileCreek PCB Source Trackdown Project, Project # GL97269306-0.

Sediment core sample locations will be determined based upon the results of the preliminary screening round, but should also be based upon existing data gaps within the project area, perceived primary and subsidiary sources of contamination and the location of depositional (amassing) areas in the creek. A total of 80 sediment core samples will be collected with three discrete sub-samples per core sample, regardless of length. All sediment core samples will be analyzed for PCBs, DDT, DDE, PCDD/Fs, Chromium, Copper, Lead, Manganese, Nickel, Cyanide, Zinc and Mercury. All core samples will also be analyzed for percent solids. A smaller subset (75) of the core samples taken will be analyzed TOC. The TOC samples will be selected from core samples based on visual observations of the sediment material. PCB samples are critical to this study. TOC data are used to correct the PCB results for comparison to sediment criteria.

All preliminary screening samples as well as sediment core samples will be referenced using a Differential Global Positioning System. Core sample locations identified at the completion of the screening results are tentative and may be relocated by the on-site field coordinator or project manager during sampling. This will be dependent upon, but not limited to; site characteristics and ability of the sampling team to collect sufficient sample material required for a sufficient core sample.

Project Milestones Sediment Sampling and Analysis

- Prepare Draft Work Plan and QAPP – June 2008.
- Comment period for stakeholders of the draft Work Plan and QAPP – July 2008.

- Finalization of the Work Plan, QAPP – July 2008.
- Mobilize equipment – August 2008.
- Sediment/Surface sampling – August 2008.
- Chemical analysis and toxicity testing – August 2008.
- Compile and analyze sediment data – September - November 2008.
- Preparation of Draft RI Report – December 2008.
- Final RI Report – January 2009.

4.4.2 REMEDIAL ALTERNATIVES ANALYSIS

A draft Feasibility Study (FS) for the Eighteenmile Creek source AOC will be developed by collecting and using all information available and necessary to evaluate the remedial alternatives that are applicable and appropriate for remediating contaminated sediment in the Eighteenmile Creek source AOC. Specific objectives of the FS are described as follows:

- Establish remedial action objectives specifying constituents and media of concern, potential exposure pathways and remediation goals;
- Identify and preliminarily evaluate remedial alternatives and potentially suitable technologies that if implemented would reduce the identified threat to public health and the environment;
- Screen the remedial alternatives identified in the preliminary evaluation of alternatives;
- Complete a detailed analysis on a limited number of alternatives that represent viable approaches to remedial action.

Project Milestones Remedial Alternatives Analysis

- Complete Remedial Alternatives Evaluation – March 2009
- Complete volume and cost estimates – June 2009
- Develop final FS report – July 2009

4.4.3 Eighteenmile Creek Restoration Program

NYSDEC will commence the Eighteenmile Creek Restoration Program for identified sources within the source AOC (watershed). The following table provides a breakdown of the work scheduled to be completed at the source area sites with the source AOC. A more detailed description of the program activities, including a proposed budget for each individual activity has been provided as Appendix B.

SITE NO	SITE NAME	TYPE OF WORK PLANNED FOR 2008 & 2009	DOCUMENTED OR POTENTIAL IMPACT	CONTAMINANTS OF CONCERN
932010	Lockport City Landfill	<u>Oversight Activities</u> Operation Maintenance & monitoring, site inspection, reporting	Migration of contaminated groundwater	PCBs, chromium, copper, lead, zinc
932012	Dussault Foundry	<u>Oversight Activities</u> oversight during field activities; surface soil sampling, etc., associated with direct implementation activities funded through USEPA	Migration of contaminated surface water through historic raceways	PCBs, PAHs, Chromium, Copper, Nickel, Zinc, and lead
932030B	AKZO Chemicals Inc.	<u>Oversight Activities</u> Operation Maintenance & Monitoring & report review	Migration of contaminated groundwater	Chlorinated Solvents
932039	Van de Mark Chemical Company, Inc.	<u>Oversight Activities</u> Operation Maintenance & Monitoring; NAPL seep activities	Migration of contaminated groundwater and NAPL	Copper, lead, zinc, and PAHs
932112	Old Upper Mountain Road Site	<u>Direct Implementation</u> Storm sewer sampling, surface water sampling; draft sampling report	Erosion of contaminated fill and possibly contaminated groundwater	Lead, PAHs, Dieldrin, Copper, Nickel, Zinc, Mercury
932113	Delphi Harrison Thermal Systems	<u>Oversight Activities</u> Operation Maintenance & Monitoring, report review, site inspections	Migration of contaminated groundwater	Chlorinated Solvents
932121	Eighteenmile Creek Corridor	<u>Direct Implementation & Oversight Activities</u> Feasibility Study; PRAP/ROD; SSF referral	Erosion of contaminated fill and groundwater	PCBs, lead, and PAHs
C932137	Delphi Lockport Building 6 Tank Area	<u>Oversight Activities</u> Work plan review (2008); implement RI (2008)	Migration of contaminated groundwater	Copper, lead, PAHs
C932138	Delphi Lockport Building 7	<u>Oversight Activities</u> Work plan review (2008); implement RI (2008 - 2009)	Migration of contaminated groundwater	Chlorinated Solvents, PCBs, PAHs, and Copper
C932139	Delphi Lockport Building 8	<u>Oversight Activities</u> Work plan review (2008); implement RI (2009 - 2010)	Migration of contaminated groundwater	Chlorinated Solvents
C932140	Delphi Lockport Building 10 North	<u>Oversight Activities</u> Startup of SVE system; Operation Maintenance & Monitoring on SVE system	Migration of contaminated groundwater	Chlorinated Solvents
NA	Upson Park	<u>Direct Implementation</u> Surface, subsurface & groundwater sampling, project oversight	Erosion of contaminated fill and groundwater	PCBs, Lead, PAHs, Chromium, Copper, and Zinc
NA	White Transportation	<u>Direct Implementation</u> Surface, subsurface & groundwater sampling, project oversight	Erosion of contaminated fill and groundwater	Lead, PCBs, PAHs, Copper, Zinc, Chromium

Project Milestone Eighteenmile Creek Restoration Program

- Complete all listed deliverables by the end of FY 2008-2009

4.5 PART V – IMPACT ASSESSMENT

The proposed project will allow for the completion of the delineation (nature, extent and volume) of areas where contaminated sediments are impacting the downstream impact AOC, macroinvertebrate communities, or posing a risk to human, fish and wildlife health. In addition, the commencement of the Eighteenmile Creek Restoration Program will assist in the control of contamination from upstream source areas. The commencement of the program past 2008-2009 will also make available the future non-federal funds necessary to remediate contaminated sediment throughout the Eighteenmile Creek AOC under a future Legacy Act proposal. Sediment remediation will contribute to the delisting of at least five identified Beneficial Use Impairments within the AOC.

4.6 PART VI – STAKEHOLDER INVOLVEMENT

Niagara County Soil & Water Conservation District will not only serve as the non-federal sponsor for this Great Lakes Legacy Act project, but currently serves as the Eighteenmile Creek RAP Coordinator for the Eighteenmile Creek AOC. Through the Eighteenmile Creek Remedial Advisory Committee (RAC), stakeholders and “advisors” that represent over 10 different agencies, organizations, academic institutions, non-profits, community and sportsmen’s groups all provide input into the remediation strategy for the Eighteenmile Creek. The following summarizes the major roles of the leading stakeholders for this Legacy Act project:

USEPA-GLNPO: Provide 65% of project funding (\$649,000) through the Great Lakes Legacy Act.

NYSDEC-Region 9: Complete all of the deliverables identified under the Eighteenmile Creek Restoration Program, which is identified in this application as the %35 local match.

Niagara County Soil & Water Conservation District: Serves as the non-federal sponsor and secures the 35% local match (\$226,171.61) for this Great Lakes Legacy Act project.

Coordinates the RAC, and all public outreach associated with the development of the remedial design. Serves as the main communication link between USEPA-GLNPO and the local stakeholders.

4.7 PART VII – TIMELINE

Year	2008										2009							
Task	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	July	Aug	
GLLA Project Agreement Negotiation	x	x																
Remedial Investigation																		
Field Sampling Plan & QAPP				x														
Sampling					x													
Chemical Analysis and Toxicity Testing					x													
Data Analysis						x	x	x										
Final RI Report										x								
Remedial Alternatives Analysis																		
Remedial Alternatives Screening											x	x						
Remedial Alternatives Evaluation													x	x	x			
FS Report																	x	
Restoration Program																		
Complete all deliverables																	x	

4.8 PART VIII – BUDGET

The estimated cost to conduct the Remedial Investigation, Remedial Alternatives Analysis and Restoration Program as proposed within this project description is \$875,171.61, of which the

local non-federal sponsor is requesting 65% match (\$649,000) from the Great Lakes Legacy Act. As the non-federal sponsor, NCSWCD will leverage its relationship with NYSDEC and provide \$226,171.61 of in-kind resources for the completion of 2008-2009 Eighteenmile Creek Restoration Program tasks. The total cost for the Remedial Investigation is estimated to be \$575,000. The total cost of the Remedial Alternatives Analysis is estimated to be \$47,000.

4.9 PART IX – AOC DOCUMENTATION

The Eighteenmile Creek Area of Concern was identified by the International Joint Commission in 1987. The Eighteenmile Creek Remedial Action Plan was completed in 1997. Two RAP Updates have been completed since that time, and Niagara County SWCD currently serves as the Eighteenmile Creek Remedial Action Plan Coordinator.

Both the 1997 Eighteenmile Creek RAP developed by NYSDEC, and the 2006 Eighteenmile Creek RAP Status Report Update developed by NCSWCD describe that the boundaries of the Eighteenmile Creek basin can be subdivided into two components, “the Eighteenmile Creek Area of Concern (AOC) (the impact area) and the Eighteenmile Creek watershed (the source area).

SECTION 5: APPENDICES

- FIGURE 1** - Map of Remedial Investigation Project Area (attached)
- FIGURE 2** - USEPA-GLNPO Map of Eighteenmile Creek AOC (attached)
- FIGURE 3** - Map of Eighteenmile Creek Restoration Program Sites (attached)
- APPENDIX A** - Concentrations, Bioaccumulation and Bioavailability of Contaminants in Surface Sediments - Eighteenmile Creek Great Lakes Area of Concern (AOC) Niagara County, New York. (electronic)
- APPENDIX B** - Remedial Investigation Report - Eighteenmile Creek Corridor, Lockport, Niagara County, New York Site Number 932121 (electronic)
- APPENDIX C** - Eighteenmile Creek Restoration Program Site Descriptions (electronic)
- APPENDIX D** - Eighteenmile Creek Restoration Program Budget Description (electronic)