EIGHTEENMILE CREEK

REMEDIAL ACTION PLAN

2006 STATUS REPORT

NIAGARA COUNTY SOIL AND WATER CONSERVATION DISTRICT

MARCH 2007

FUNDING PROVIDED BY THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

PAGE INTENTIONALLY LEFT BLANK

TABLE OF CONTENTS PAGE

FIGURES AND TABLES **PAGE**

ACKNOWLEDGEMENTS

The 2006 Eighteenmile Creek Remedial Action Plan Status Report was prepared by the Niagara County Soil and Water Conservation District (SWCD) in cooperation with the Eighteenmile Creek Remedial Advisory Committee (RAC) and numerous other agencies. Funding for 2005-2006 Remedial Action Plan management and oversight was provided by United States Environmental Protection Agency, Great Lakes National Program Office and Region 2.

Eighteenmile Creek Remedial Advisory Committee

Matthew Barmasse
ISOCHEM, Inc.

Theodore Belling
Niagara County Planning & Environment – Retired

Michael Diel
City of Lockport Wastewater Treatment Plant

Victor DiGiacomo, Jr.
Niagara County Soil & Water Conservation District

Ronald Gwozdek
Niagara County Health Department

Tim Horanburg
Supervisor, Town of Newfane

Roy Knapp
Delphi Harrison Thermal Systems

Paul Lehman
Niagara County Cornell Cooperative Extension

Richard Robinson
Niagara County Cornell Cooperative Extension- Retired

Paula Sattleberg
City of Lockport Wastewater Treatment Plant

Mark Seider
Niagara County Soil & Water Conservation District

Gregory Tessmann
U.S.D.A. Natural Resources Conservation Service

Niagara County Soil & Water Conservation District

Mark Seider P.E., District Manager/Engineer

Victor DiGiacomo, Jr., RAP Coordinator

Charles Kesterson, District Laborer

Darcy Tone, District Secretary

Copies of this report may be obtained from:

Niagara County Soil & Water Conservation District
4487 Lake Avenue
Lockport, New York 14094
(716) 434-4949
www.niagaraswcd.com
www.eighteenmilerap.com

EXECUTIVE SUMMARY

In August 1997 the Eighteenmile Creek Remedial Action Plan (RAP) was completed by the New York State Department of Environmental Conservation (DEC). With the assistance of a Remedial Advisory Committee (RAC), the DEC was responsible for the coordination of the RAP between 1997 and 2005. As of January 1, 2005, the Niagara County Soil & Water Conservation District (SWCD) has taken over as lead agency for the RAP. The SWCD also assists the Eighteenmile Creek RAC by facilitating their quarterly meetings and providing staff support towards the implementation of the RAP.

The 1997 RAP contained initial commitments to implement the remedial action strategy. In 2001, DEC published a Status Report to update the RAP. This 2006 report summarizes the accomplishments from April 2001 through December 2006. It also identifies the projected activities for the period beginning January 2007.

AOC IN REVIEW

- The Eighteenmile Creek Area of Concern (AOC) is located in the Town of Newfane, Niagara County, in Western New York State.
- The Eighteenmile Creek watershed is centrally located within the bounds of Niagara County, covering an area of 58,056 acres within the towns of Newfane, Hartland, Royalton, Lockport, Cambria, and Wilson.
- The watershed includes The Gulf creek, East Branch Eighteenmile Creek and augmented flow from the New York Barge Canal.
- Eighteenmile Creek was designated as an AOC because of existing fish consumption advisories, degradation of benthic populations and dredging restrictions.
- Over the years, numerous contaminants have been identified in creek sediments, which include but are not limited to; Polychlorinated Biphenyls (PCBs); Mercury; Dioxins and Furans; Dieldrin; Mirex; DDT; Lead; and Copper.
- Contaminated sediments have contributed to the following confirmed Beneficial Use Impairments: Restrictions on fish and wildlife consumption; Degradation of benthitic organisms and; Restrictions on dredging activities in the AOC.
- Bird/Animal deformities or reproductive problems is currently considered as a "likely" Beneficial Use Impairment.
- The status of fish tumors or other deformities, and fish and wildlife populations is currently unknown.

SEDIMENT QUALITY

- The Eighteenmile Creek Great Lakes Area of Concern (AOC) has three identified use impairments, all of which are linked to sediment contamination: (1) restrictions on fish and wildlife consumption; (2) degradation of benthos; and (3) restrictions on dredging activities. The contaminants of concern associated with these impairments include organic compounds, chlorinated pesticides, polychlorinated biphenyls (PCBs), dioxins/dibenzofurans (PCDD/Fs), and metals such as chromium, copper, lead, manganese, mercury, nickel, zinc and cyanide.

- Project Updates include detailed information about the following: Former Flintkote Plant Site Sediment Investigation; AOC Surface Sediment Investigation; Investigation of PCB Contamination in Erie Canal Sediments; Eighteenmile Creek Corridor Investigation; PCB Source Trackdown Project.

WATER QUALITY

- The Eighteenmile Creek Area of Concern is classified as a class C stream from the Burt Dam to just upstream of the Route 18 Bridge in the Village of Olcott. This indicates that the highest intended use of this reach is fish propagation. From just upstream of the Route 18 Bridge to the harbor outlet to Lake Ontario, the creek is classified as a class B stream which indicates the highest use is primary contact recreation (swimming).

- Project Updates include detailed information about the following: NYSDEC Rotating Intensive Basin Studies (RIBS); Industrial & Municipal Wastewater Discharges; Combined Sewer Overflows; Lake Ontario Tributary Investigation; Nutrient & Soil Loss Investigation; Soil Water Assessment Tool (SWAT); Agricultural Environmental Management (AEM); Water Quality Monitoring Project.

FISH & WILDLIFE

- Eighteenmile Creek is one of about ten major tributaries in the Great Lakes Plain ecological region. The extensive beds of emergent and submergent aquatic vegetation in this area account for an estimated 65 acres, comprising one of the largest coastal wetlands in the western portion of Lake Ontario. Eighteenmile Creek is particularly significant because large concentrations of Coho and Chinook salmon and brown trout migrate from Lake Ontario into the creek each fall, from late August through December. In addition, steelhead migrate into Eighteenmile Creek during the fall and between late February and April. Eighteenmile Creek also contains a

diverse warm-water fishery. The area supports substantial natural reproduction by smallmouth bass, northern pike, rock bass, black crappie, brown bullhead, and largemouth bass.

- Project Updates include detailed information about the following: AOC Planktonic Community Study; AOC Baseline Habitat Characterization; Streambank Stabilization/Habitat Restoration (Phase I); Streambank Stabilization/Habitat Restoration (Phase II); NYSDEC Fish Stocking Program; Pen Rearing Project; Fall 2005 Lake Ontario Tributary CREEL Survey and; AOC Marsh Monitoring Program

INACTIVE HAZARDOUS WASTE SITES

- Contaminants in the ground water and soil at hazardous waste sites have the potential to migrate off site. Because of this, sites within the Eighteenmile Creek watershed are potential sources of contamination to the creek. During its original development, the Eighteenmile Creek RAP identified 15 inactive hazardous waste sites in the watershed. Three additional sites were identified subsequent to the completion of the RAP which included Delphi Harrison/ TCE Site, Guterl Steel/ Plant Site, and Flintkote Property (William Street Island).

- Project Updates include detailed information about the following: AKZO CHEMICAL PLANT SITE; GUTERL STEEL LANDFILL SITE; GUTERL STEEL PLANT SITE; DELPHI HARRISON TCE SITE and; FLINTKOTE PROPERTY (WILLIAM STREET ISLAND SITE)

RAP PLANNING/ EDUCATION & OUTREACH

- This section summarizes accomplishments related to general Remedial Action Plan planning, education and outreach and general AOC and watershed initiatives on a grandiose scale. Project updates include detailed information about the following: Watershed Management Plan Concept Document; State Of The Basin Report; AOC Report Card; Pollutant Generator Database; Newfane Environmental Fair; Eighteenmile Creek Education Series.

NEXT STEPS

- This section includes a synopsis of plans and next steps for projects related to the Eighteenmile Creek Area of Concern and its Remedial Action Plan. Next steps are tentative and subject to change in the event of: lack of funding; change in program direction and; change in scope.

PAGE INTENTIONALLY LEFT BLANK

1.0 INTRODUCTION

The Eighteenmile Creek Area of Concern (AOC) is located in the Town of Newfane, Niagara County, in Western New York State (Figure 1-1). The creek flows from the south and discharges through Olcott Harbor into Lake Ontario, approximately 18 miles east of the mouth of the Niagara River. The AOC includes Olcott Harbor at the mouth of the creek and extends upstream to the farthest point at which backwater conditions exist during Lake Ontario's highest monthly average lake level. This point is located just downstream of the Burt Dam, approximately 2 miles south of Olcott Harbor.

The Eighteenmile Creek watershed is centrally located within the bounds of Niagara County. (Figure 1-2) It is the largest drainage basin within Niagara County, covering an area of 58,056 acres within the towns of Newfane, Hartland, Royalton, Lockport, Cambria, and Wilson. The watershed includes The Gulf creek (The Gulf), East Branch Eighteenmile Creek and augmented flow from the New York Barge Canal. Downstream of the Burt Dam is primarily composed of cropland, orchards and residential areas. Upstream of the Burt Dam, the watershed is composed mainly of cropland and orchards, with residential and commercial areas like the historically industrialized City of Lockport. (Figure 1-3)

The main branch of the creek originates southeast of the City of Lockport, and travels westerly and northwesterly through the city. Over the years the creek has become "tunneled" and is completely underground through the City. The creek "daylights" just south of the New York Barge Canal, where it proceeds to go under the Canal accompanied by augmented flow from the Canal. (Figure 1-4) From its resurfacing north of the Canal to its junction with The Gulf, Eighteenmile Creek cascades the Niagara Escarpment descending approximately 240 feet. The creek continues in a northerly direction through the Town of Newfane, to its mouth at Olcott along Lake Ontario.

As of January 1, 2005, the Niagara County Soil & Water Conservation District (NCSWCD) has assumed the role of coordinator of Eighteenmile Creek's Remedial Action Plan (RAP). The District also assists the Eighteenmile Creek Remedial Advisory Committee (RAC) by facilitating their quarterly meetings and providing staff support towards the implementation of the creek's RAP. The Eighteenmile Creek RAC is a group of local officials, landowners, and stakeholders selected by the commissioner of the NYSDEC to provide a balanced representation of various segments of the community along the creek. Initially, the RAC worked cooperatively with the NYSDEC to organize, develop and review the RAP and create public awareness and support for Eighteenmile Creek. Additionally, it is the responsibility of the RAC to:

- Advise in identifying and updating priorities for RAP implementation activities;
- Advise in the preparation and approval of RAP documents;

- Assist in building a stakeholder base for implementation of RAP recommendations;
- Review and comment on current environmental initiatives and issues affecting the RAP;
- Assist in developing and seeking funding for a list of activities requiring funding; and
- Assist with social and economic impacts of RAP implementation.

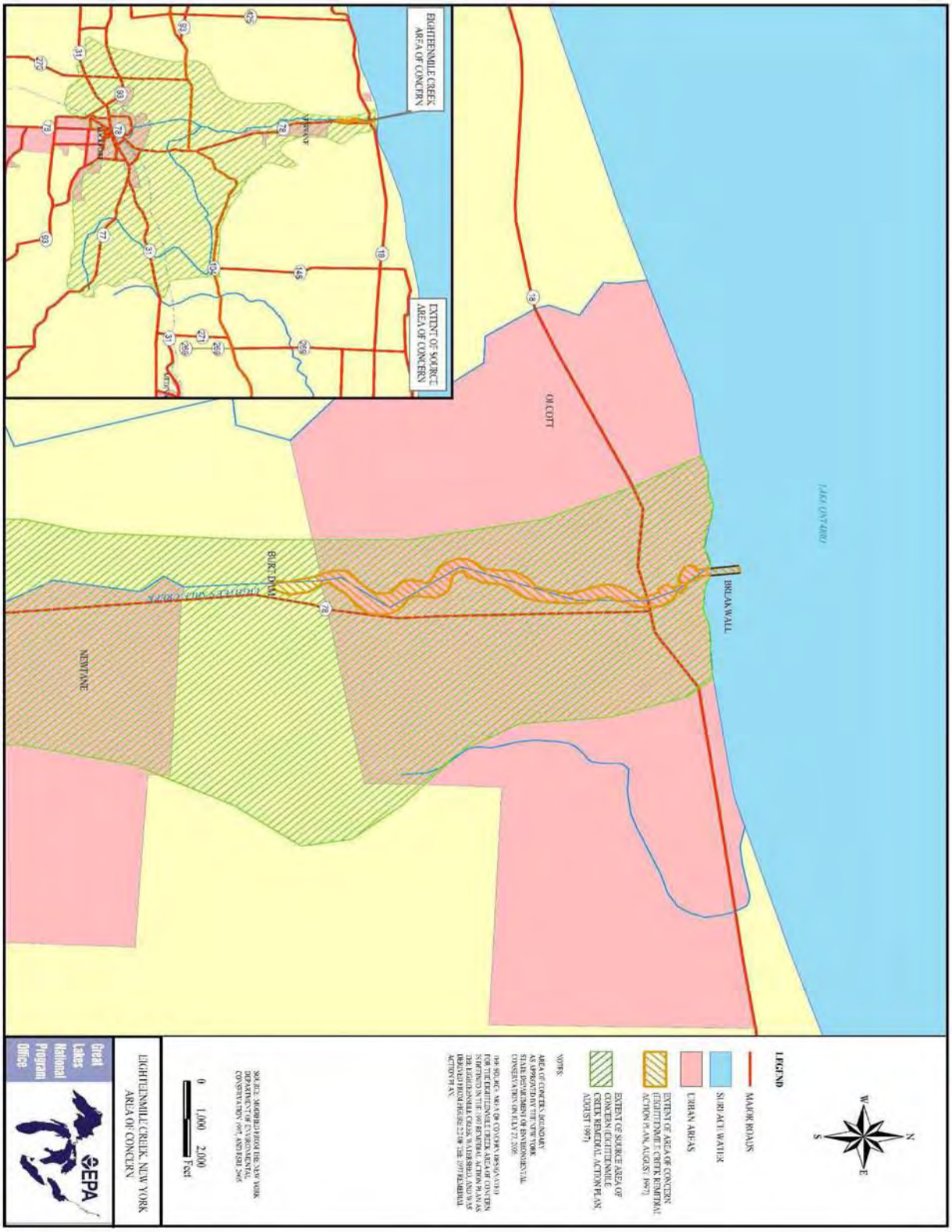
The RAC has been instrumental in the development of the RAP and the implementation of various public outreach activities. These activities have maintained the continued involvement and interest of the organizations represented on the RAC and built general interest and support for the RAP in the overall community.

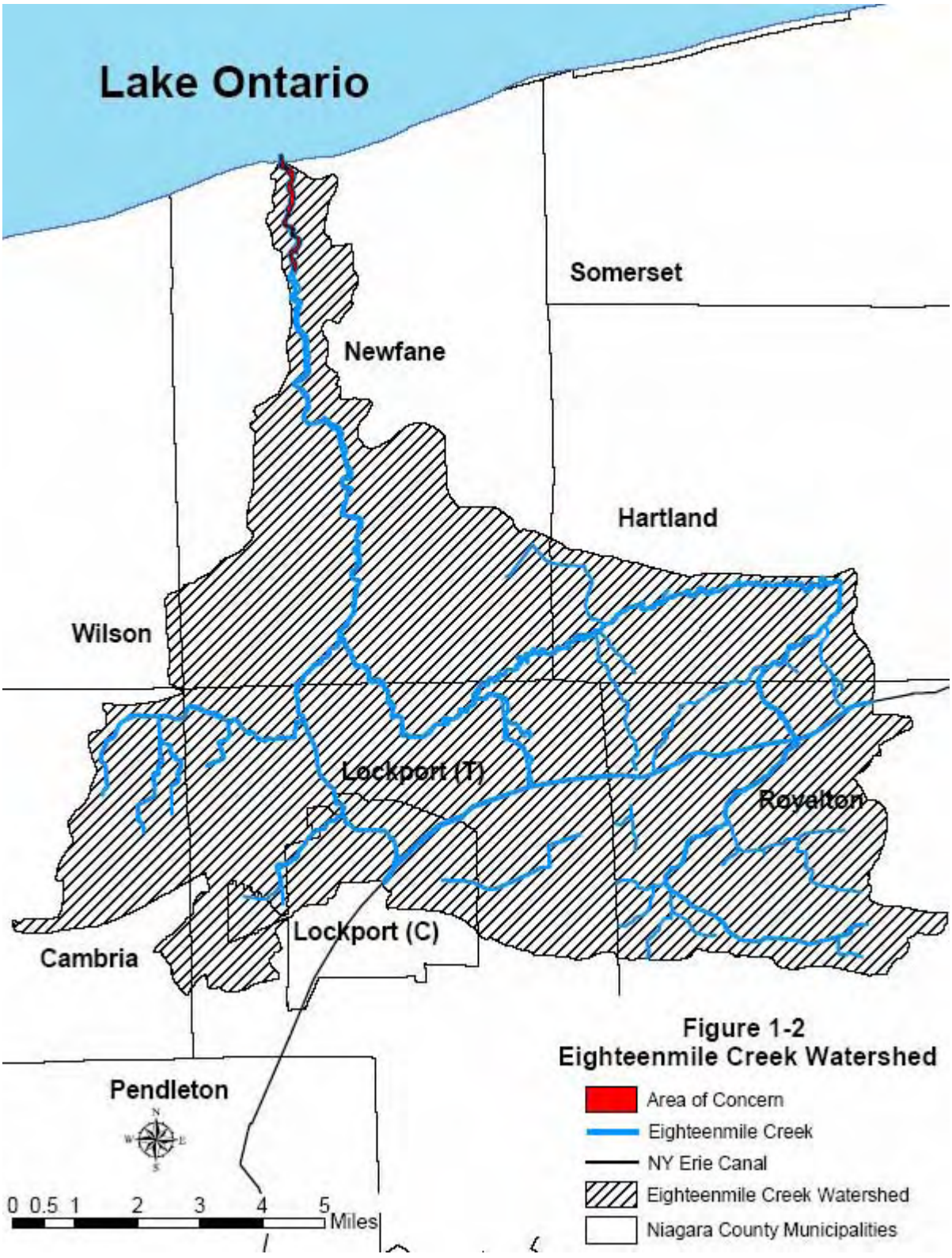
Eighteenmile Creek was designated as an AOC because of water quality and bottom sediment issues associated with past industrial and municipal discharge practices, the disposal of waste and the use of pesticides. Over the years, numerous contaminants have been identified in creek sediments which have a detrimental effect to the AOC and Lake Ontario. These contaminants include but are not limited to; Polychlorinated Biphenyls (PCBs); Mercury; Dioxins and Furans; Dieldrin; Mirex; DDT; Lead; and Copper. Sediments contaminated with these substances have contributed to restrictions on fish and wildlife consumption, degradation of benthitic organisms, and restrictions on dredging activities in the AOC. It is also suspected that these contaminated sediments contribute to a degradation of fish and wildlife populations, the presence of fish tumors, and the prevalence of bird and animal deformities or reproductive problems.

Development of the Eighteenmile Creek RAP was initiated in March of 1994. A combined final Stage 1 and Stage 2 RAP document was completed and published in August of 1997 by NYSDEC in cooperation with the Eighteenmile Creek RAC. Efforts to complete this publication included conducting two RAP review workshops, public information and comment meetings, field trips, as well as numerous committee meetings. A RAP Status Report document was completed by the NYSDEC in June of 2001.

Prior to 2005, NYSDEC and other responsible agencies carried out numerous efforts intended to address the various environmental concerns along and within Eighteenmile Creek. To continue the advancement of Eighteenmile Creek's remediation, the district as new lead agency has diligently attempted to progress these past efforts while advancing newer initiatives. A summary of the status of these undertakings and an overview of current commitments is presented.

FIGURE 1-1 EIGHTEENMILE CREEK AREA OF CONCERN




Lake Ontario
Somerset
Newfane
Hartland
Wilson
Lockport (T)
Royalton
Cambria
Lockport (C)
Pendleton
0 0.5 1 2 3 4 5 Miles
Figure 1-2
Eighteenmile Creek Watershed
Area of Concern
Eighteenmile Creek
NY Erie Canal
Eighteenmile Creek Watershed
Niagara County Municipalities

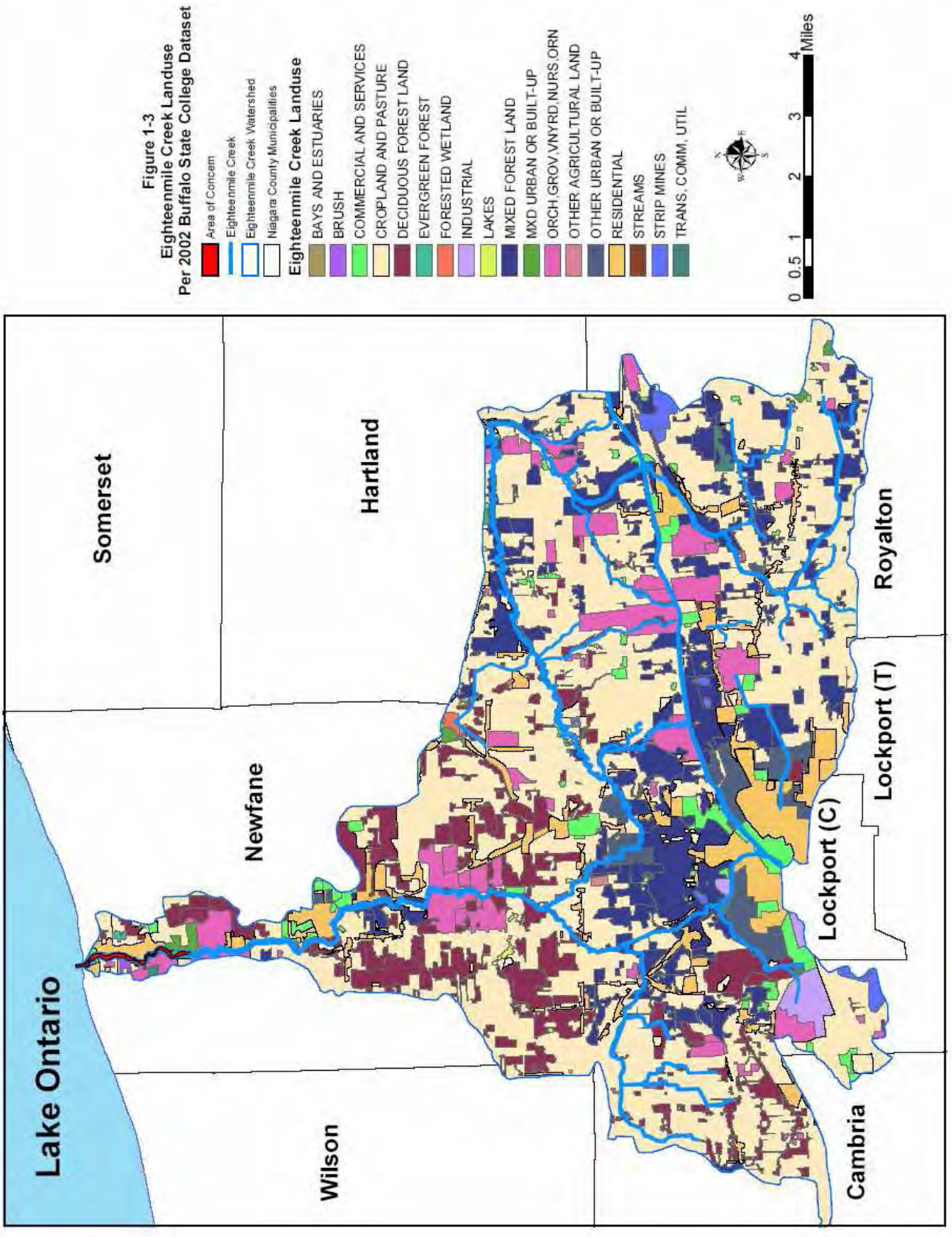
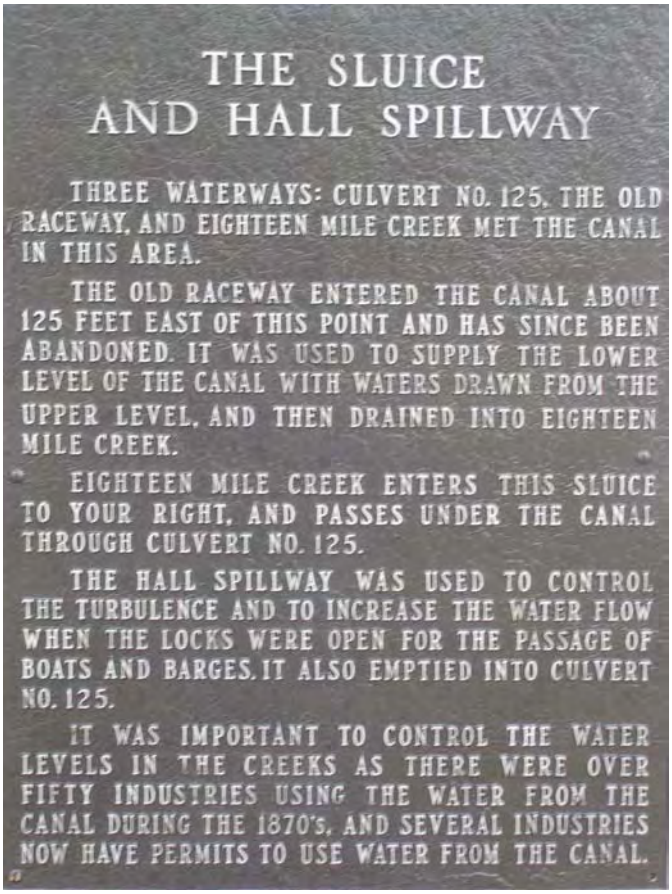


Figure 1-3
Eighteenmile Creek Landuse
Per 2002 Buffalo State College Dataset
Area of Concern
Eighteenmile Creek
Eighteenmile Creek Watershed
Niagara County Municipalities
Eighteenmile Creek Landuse
BAYS AND ESTUARIES
BRUSH
COMMERCIAL AND SERVICES
CROPLAND AND PASTURE
DECIDUOUS FOREST LAND
EVERGREEN FOREST
FORESTED WETLAND
INDUSTRIAL
LAKES
MIXED FOREST LAND
MXD URBAN OR BUILT-UP
ORCH,GROV,VNYRD,NURS,ORN
OTHER AGRICULTURAL LAND
OTHER URBAN OR BUILT-UP
RESIDENTIAL
STREAMS
STRIP MINES
TRANS, COMM, UTIL
0 0.5 1 2 3 4 Miles
Somerset
Hartland
Royalton
Newfane
Lockport (T)
Lockport (C)
Lake Ontario
Wilson
Cambria

FIGURE 1-4 AUGMENTED FLOW FROM NY BARGE CANAL



2.0 SEDIMENT QUALITY

The Eighteenmile Creek Great Lakes Area of Concern (AOC) has three identified use impairments, all of which are linked to sediment contamination: (1) restrictions on fish and wildlife consumption; (2) degradation of benthos; and (3) restrictions on dredging activities. The contaminants of concern associated with these impairments include organic compounds, chlorinated pesticides, polychlorinated biphenyls (PCBs), dioxins/dibenzofurans (PCDD/Fs), and metals such as chromium, copper, lead, manganese, mercury, nickel, zinc and cyanide.

There have been numerous sediment quality studies completed and initiatives pursued on Eighteenmile Creek in recent years. The following section documents those efforts from 2002 to 2006.

2.1 FORMER FLINTKOTE PLANT SITE SEDIMENT INVESTIGATION

In 2002, the New York State Department of Environmental Conservation (NYSDEC) in conjunction with Niagara County Department of Health (NCHD), conducted three separate sampling events of Eighteenmile Creek and properties along Water Street in the City of Lockport, Niagara County, New York (Figure 2-1). The objective of the three sampling events was to obtain information sufficient to determine if the properties along Water Street are being impacted by the Former Flintkote Plant Site and/or Eighteenmile Creek. This objective was evaluated through the analysis of waste, surface soil and sediment samples obtained from Water Street properties, Eighteenmile Creek and wooded property south of the Former Flintkote Plant Site.

On April 16, 2002 the Department collected one waste and three surface soil samples from the property along Water Street. This property was sampled due to its close proximity to the Former Flintkote Plant Site, and because of the potential for contaminants to migrate to the property from Eighteenmile Creek during flood events. While the Former Flintkote Plant Site is not listed in the Registry of Inactive Hazardous Waste Disposal Sites in New York State (Registry), a Site Investigation conducted by the Department's Division of Environmental Remediation (DER) in 1999 revealed that some of the ash disposed at the Site is a characteristic hazardous waste for lead. This waste also contains numerous semivolatile (primarily PAHs) and inorganic compounds at concentrations above the soil cleanup objectives contained in the Department's Technical and Administrative Guidance Memoranda (TAGM) No. 4046. PCBs were also detected in this waste. Similar contaminants have been detected in sediment of Eighteenmile Creek and the millrace adjacent to the Site.

Based upon the results of the April 16th sampling event, fifteen additional surface soil samples were collected from properties along Water Street on July 23, 2002. During this sampling event, the NYSDEC also collected one

sediment sample from Eighteenmile Creek and two waste samples from wooded property south of the Former Flintkote Plant Site. The July 23rd sampling was completed to further evaluate the extent of lead contamination detected on Water Street properties and to verify the PCB results obtained from a surface soil sample collected near Eighteenmile Creek.

On November 7, 2002, NYSDEC and NCHD personnel discovered a fenced containment structure downstream of the Clinton Street dam. This structure may have housed transformers and/or capacitors, which historically contained PCB oil. As a result, this area was identified as a potential source of PCBs to Eighteenmile Creek. To evaluate this potential, two surface soil samples and three sediment samples were collected from this area on November 26, 2002.

During the April 16th sampling event, one waste sample was collected and analyzed for PCBs and lead. These contaminants were selected for analysis because PCBs are known to exist in Eighteenmile Creek sediment, while ash at the Former Flintkote Plant Site contains high concentrations of lead. Four additional waste samples were collected on July 23, 2002 and also analyzed for PCBs and/or lead. The analytical results of these samples indicate that PCBs are not present in these wastes, but that lead is present at concentrations ranging from 4.5 to 4,250 mg/kg (parts per million).

Surface soil samples were collected during each of the sampling events conducted in 2002. Three samples were collected on April 16, 2002; thirteen samples were collected on July 23, 2002; and two samples were collected on November 26, 2002. All of these samples were collected from specific Water Street properties. All samples were analyzed for PCBs and/or lead. The lead concentration in thirteen of these samples exceeded the NYSDEC's TAGM 4046 soil cleanup objective for this contaminant. The concentration of lead in these samples ranged from 549 to 4,630 mg/kg.

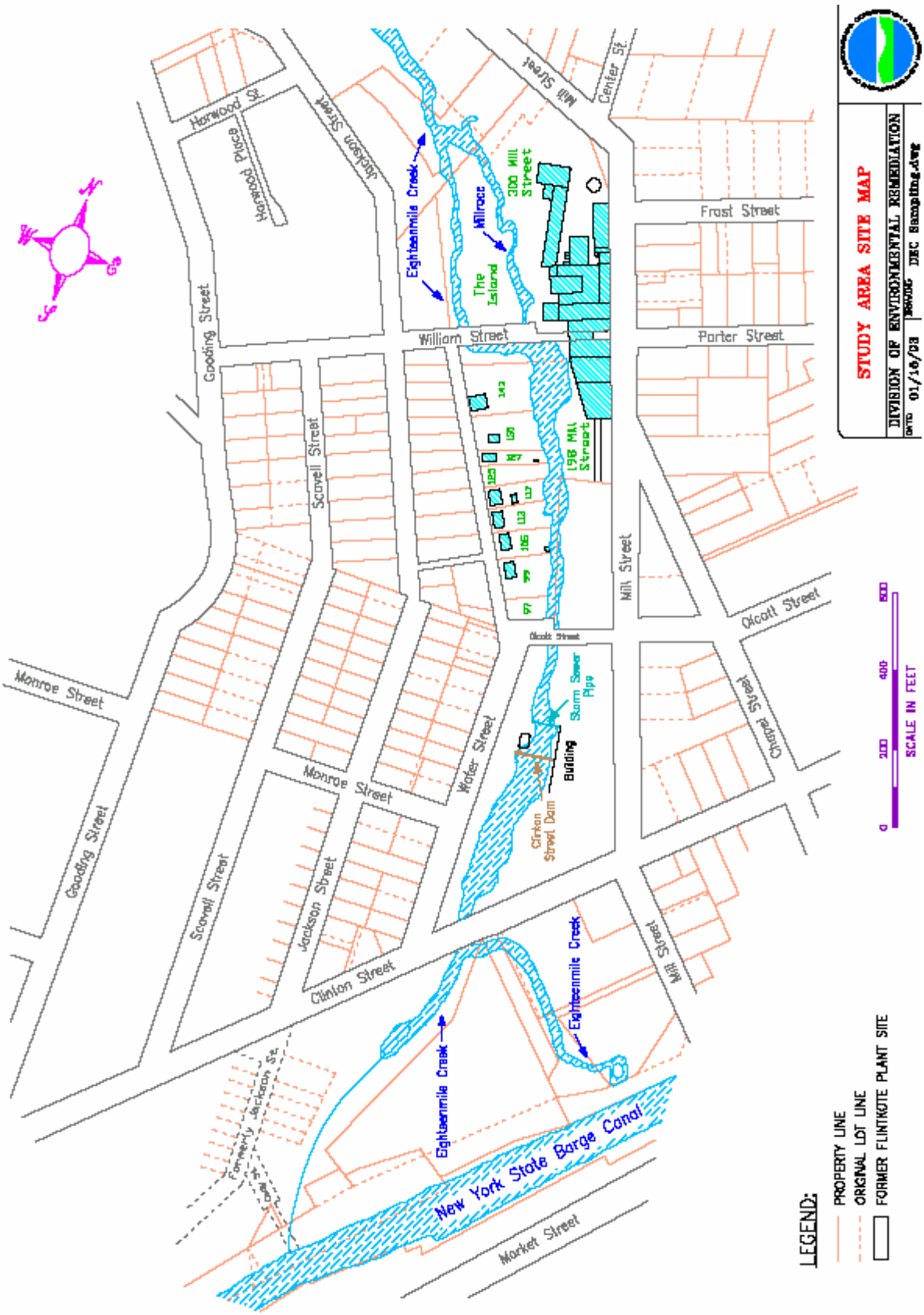
PCBs were detected in four of eight surface soil samples collected from properties along Water Street at concentrations that exceeded the NYSDEC's TAGM 4046 surface soil cleanup objective (1,000 μg/kg) for this contaminant. The concentration of PCBs in these samples ranged from 1,210 to 17,400 μg/kg. Four sediment samples were collected from Eighteenmile Creek during the three sampling events conducted in 2002. To date, the NYSDEC has collected twenty sediment samples from fifteen locations in Eighteenmile Creek between Remick Parkway (south of the New York State Barge Canal) and the Former Flintkote Plant Site. The analytical results of these samples indicate that PCBs were detected in eighteen of nineteen samples (the twentieth sample was not analyzed for PCBs) at concentrations ranging from 13.3 to 24,926 μg/kg. Although only one of these concentrations exceeds the NYSDEC's sediment criteria (19,300 μg/kg) for chronic toxicity to benthic aquatic life, all eighteen concentrations exceed the sediment criteria (0.8 μg/kg) for human health bioaccumulation. These results also

indicate that lead was detected in all fifteen samples in which this contaminant was analyzed at concentrations ranging from 103 to 25,400 mg/kg. Although fourteen of these concentrations exceed the sediment criteria (110 mg/kg) for the severe effect level, only six concentrations exceed the TAGM 4046 soil cleanup objective.

The source(s) of the lead and PCBs that were detected in surface soil at specific Water Street property include(s) surface water/solids runoff from the ash ridge along Eighteenmile Creek, the presence of ash fill, and the deposition of contaminated sediments from Eighteenmile Creek during flood events. For the remaining Water Street properties, the source of lead and PCBs appears to be the deposition of contaminated sediment from Eighteenmile Creek during flood events; PCBs and lead were detected in creek sediment from Remick Parkway to the confluence with the millrace adjacent to the Former Flintkote Plant Site. The exact source of this lead is unknown.

Upstream of the Clinton Street dam, PCB concentrations were relatively low, ranging from 13.3 to 361µg/kg. Immediately downstream of the dam, PCB concentrations increase substantially (840 to 3,662 µg/kg), and remain elevated throughout the portion of Eighteenmile Creek evaluated in this study. These data suggest a source of PCBs near the Clinton Street dam. This source, however, does not appear to be the former transformer area or the extensive ash fill that was observed south of the Former Flintkote Plant Site. At this time the source remains unknown. NYSDEC Division of Environmental Remediation has recommended that the collection and analysis of additional sediment samples from Eighteenmile Creek is necessary to further evaluate the nature and extent of contamination in the creek. (NYSDEC 2003; May)

FIGURE 2-1 EIGHTEENMILE CREEK STUDY AREA SITE MAP



2.2 EIGHTEENMILE CREEK AREA OF CONCERN SURFACE SEDIMENT INVESTIGATION

To assess the overall toxicological risk of surficial sediment contamination within the AOC that is currently exposed to the aquatic community, the U.S. Army Corps of Engineers (USACE), Buffalo District collected surface sediment samples from 15 locations within lower Eighteenmile Creek in August 2003. These discrete samples were composited to represent five separate reaches within the AOC: moving upstream from approximately upper Olcott Harbor to Burt Dam, these were Reaches EBU1, EBU2, EBU3, EBU4 and EBU5 (See Figure 2.2). The sediment samples were subjected to physical, chemical and bioaccumulation testing. Chemical testing included various heavy metals, and organic contaminants including chlorinated pesticides, PCBs and Polychlorinated p-dibenzo dioxins and polychlorinated p-dibenzo furans (PCDD/Fs). The bioaccumulation experiments entailed a standard 28-day freshwater laboratory test using a surficial sediment deposit feeding aquatic oligochate, and focused on metals, chlorinated pesticides and PCBs. The specific objectives of this investigation were to:

- Ascertain the concentrations of all of the contaminants tested in surface sediments within the AOC. Evaluate these levels relative to selected freshwater toxicity threshold values, mainly relevant sediment quality criteria, and;
- Assess the bioaccumulation of metals, chlorinated pesticides and PCBs to determine their potential to bioaccumulate in aquatic organisms. Further, quantify and assess the bioavailability of pesticides and PCBs through the calculation and evaluation of biota-sediment accumulation factors (BSAFs).

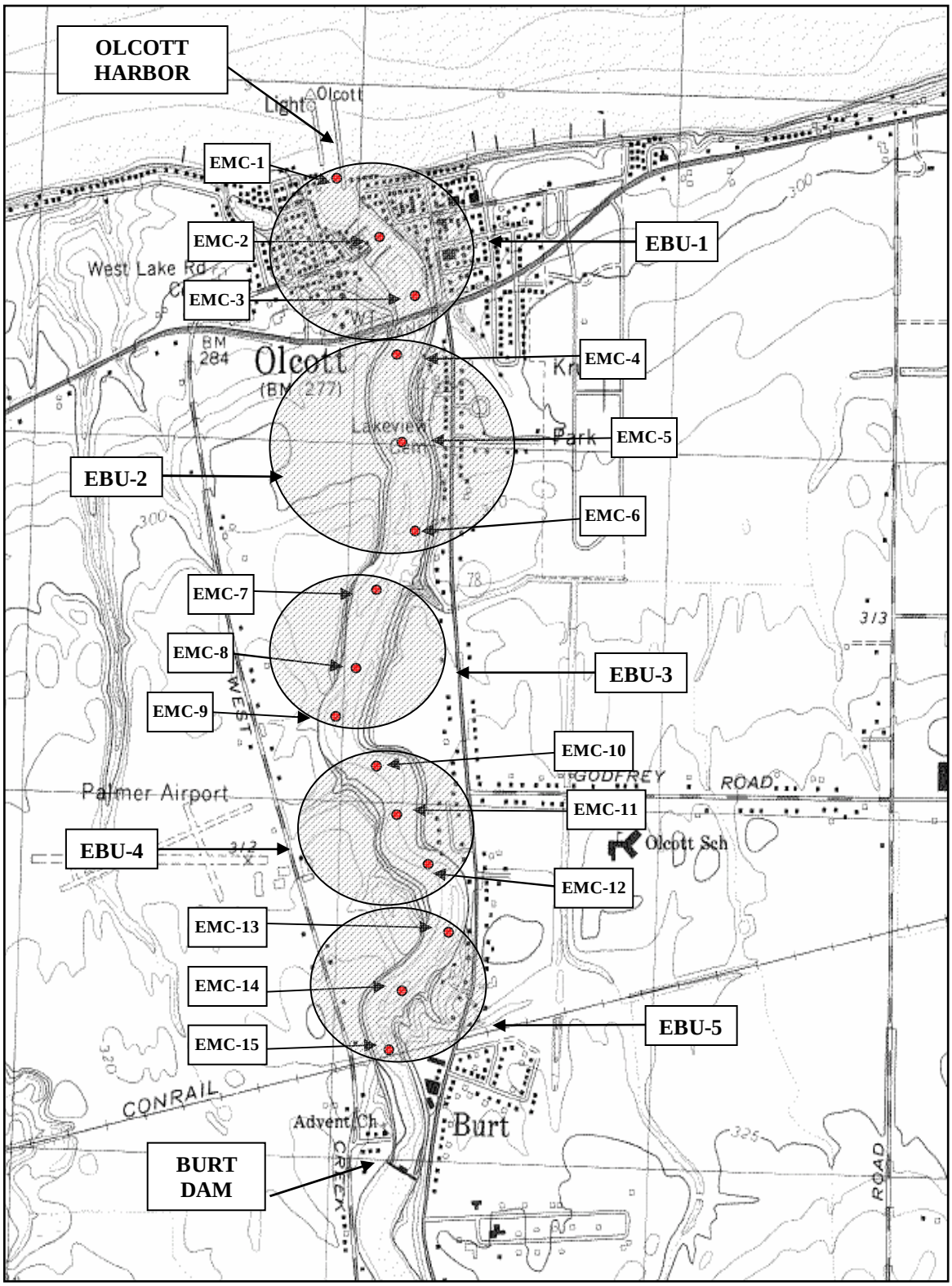
The results of this investigation are reported in Pickard (2006). Heavy metals data indicated that concentrations of various metals in surficial sediments, particularly copper, chromium, lead, nickel and zinc, may exert chronic toxicity throughout the AOC. Metal contamination in sediments within reaches EBU3 and EBU5 appear to have the most potential to pose chronic toxicity. Potential for sediment-associated lead and zinc toxicity was consistent throughout the AOC. The bioaccumulation data suggest little bioavailability or bioaccumulation risk associated with heavy metal contamination.

Organic contaminant data indicated that levels of the pesticide dichlorodiphenyldichloroethylene (DDE) in surficial sediments within Reaches EBU1 through EBU4 may be chronically toxic. Bioaccumulation data indicated that DDE was bioavailable throughout AOC surface sediments (mean BSAF range = 1.21 to 5.41). The high bioavailability of DDE in surficial sediment in Reaches EBU3 (BSAF = 4.60) and EBU5 (BSAF = 5.41) indicate that it is bioaccumulating in benthic invertebrates, and is likely to bioaccumulate in predator fish and higher trophic levels. Both sediment and bioaccumulation data suggest that PCBs in surficial sediments throughout most or all of the AOC are being bioaccumulated to levels that pose a risk to aquatic organisms. 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 in Reaches EBU3 (BSAF = 2.95) and EBU5 (BSAF = 4.36) indicate that they are bioaccumulating in benthic invertebrates, and are likely to bioaccumulate in predator fish and higher trophic levels. The site-specific BSAFs determined in this investigation can be applied to conservatively predict the bioaccumulation of DDE and PCBs by indigenous benthic organisms from AOC sediments. PCDD/F contamination in surficial sediments throughout the AOC indicates a bioaccumulation risk to wildlife.

This investigation concluded that surficial sediments throughout the AOC contain levels of contaminants that should be of toxicological concern. When considering both metal and organic compound contamination, surficial sediments within AOC Reaches EBU3 and EBU5 are the most contaminated and appear to present the highest toxicological risk.

FIGURE 2-2 EIGHTEENMILE CREEK AOC SEDIMENT SAMPLING SITES AND REACHES



2.3 INVESTIGATION OF PCB CONTAMINATION IN NEW YORK STATE BARGE CANAL SEDIMENTS

At the behest of New York State Electric and Gas (NYSEG), URS Corporation investigated the extent of PCB contamination within New York State Barge Canal sediments. This investigation was initiated by NYSEG and URS when PCB contamination was discovered within Barge Canal sediments during remedial investigations of NYSEG's Transit Street and State Street Former Manufactured Gas Plant (MGP) sites in the City of Lockport. The New York Barge Canal discharges flow to Eighteenmile Creek and has long been suspected as a source of contamination to Eighteenmile Creek and the Area of Concern. The area of New York Barge Canal investigated by NYSEG/URS included an area approximately 2000 feet upstream of the Lockport locks and an area approximately 250 feet down stream of the Lockport locks. The location of the overflow weir that discharges Canal water to Eighteenmile Creek is located approximately 750 feet downstream of the Lockport locks.

In 2005, a total of 53 sediment samples were collected within the New York Barge Canal and analyzed for PCB's. PCB's were detected in all sediment samples collected. Four different mixtures of PCB Aroclors were detected (i.e., Aroclor 1242, Aroclor 1248, Aroclor 1254 and Aroclor 1260). Aroclor 1248 was the most frequently detected, appearing in 48 of 53 samples, followed Aroclor 1254, which was detected in 38 of 53 samples. Aroclors 1242 and 1260 were detected in 6 and 4 out of 53 samples, respectively.

The four locations in which Aroclor 1260 was detected are all upstream from the Lockport locks. Aroclor 1260 concentrations ranged from 13 to 600 micrograms per kilogram (ug/kg). The highest concentrations of Aroclor 1242 were detected in sediments downstream and below of the Lockport locks. Concentrations below the locks ranged from 21,000 ug/kg to 220,000 ug/kg. Aroclor 1242 was also detected upstream of the Lockport locks with levels ranging from 84 ug/kg to 4,600 ug/kg.

Detections of Aroclor 1248 and Aroclor 1254 were widespread throughout the New York Barge Canal sediments. The highest detected Aroclor 1248 concentration of 40,000 ug/kg was detected at the furthest downstream sampling location. Concentrations ranged from 7 to 20,000 ug/kg at the 47 other locations where Aroclor 1248 was detected. The highest concentration of Aroclor 1254 were detected in sediments downstream of the locks. Those concentrations range from 16,000 and 90,000 ug/kg. The remaining 36 detections of Aroclor 1254 were spread throughout the sampling area and ranged from 22 to 11,000 ug/kg. (URS Corporation 2006)

This investigation plainly characterizes that extensive PCB contamination exists within the New York Barge Canal upstream and downstream of the Lockport locks. It also characterizes that the highest concentrations of PCBs were detected at the sampling locations closest to the Canal discharge to Eighteenmile Creek.

FIGURE 2-3 NEW YORK BARGE CANAL SEDIMENT SAMPLING AREA

2.4 EIGHTEENMILE CREEK CORRIDOR INVESTIGATION

During the Fall of 2005 the NYSDEC completed a Remedial Investigation of the Eighteenmile Creek Corridor Site to better define the nature and extent of sediment contamination in Eighteenmile Creek and the millrace 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. The Eighteenmile Creek Corridor Site is located between the New York State Barge Canal and Harwood Street in the City of Lockport, Niagara County, New York. These source areas include the Former Flintkote Plant Site, the White Transportation property, the former United Paperboard Company property, Upson Park and the New York State Barge Canal. The objectives of the Remedial Investigation were evaluated through the analysis of waste, surface soil and sediment samples obtained from Water Street properties, Eighteenmile Creek, the New York State Barge Canal and other properties along the creek between the canal and the Former Flintkote Plant Site.

PCBs were detected in fifty-eight of sixty-one sediment samples collected from Eighteenmile Creek and the millrace at concentrations ranging from 7.0J to 1,400,000 μg/kg. The principal aroclors detected were 1248, 1254 and 1260, although aroclor 1242 was detected in several samples. Thirty-eight of the samples contained PCBs at concentrations that exceeded the NYSDEC sediment criterion (606.0 μg/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, seven samples at four locations contained PCBs at concentrations that exceeded the 50,000 μg/kg hazardous waste criterion. (Figure 2-4)

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. The concentrations of PCBs (and aroclors) in creek and millrace sediment, however, suggest that other sources of PCBs to the creek exist. Contaminated fill on the White Transportation property, the former United Paperboard Company property and at the Former Flintkote Plant Site do not appear to be significant sources of PCBs to the creek and millrace.

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. (Figure 2-5) The concentrations of copper at all of these source areas are higher than the NYSDEC sediment

criterion for the severe effect level, suggesting that these properties 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. (Figure 2-6) 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 source areas are higher than the NYSDEC sediment criterion for the severe effect level, suggesting that these properties have the potential to adversely impact Eighteenmile Creek. Lead concentrations in fill material from Upson Park, the former United Paperboard Company property and the Former Flintkote Plant Site exceed 1,000 mg/kg, suggesting that these sites could be major sources of lead to the creek.

Zinc was detected in all fifty-seven sediment samples analyzed for zinc at concentrations ranging from 37.1 to 23,600 mg/kg. (Figure 2-7) 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 source areas are higher than the NYSDEC sediment criterion for the severe effect level, suggesting that these properties have the potential to adversely impact Eighteenmile Creek. Zinc concentrations in fill material from Upson Park, the former United Paperboard Company property and the Former Flintkote Plant Site exceed 1,000 mg/kg, suggesting that these sites could be major sources of zinc to the creek.

The Remedial Investigation of the Eighteenmile Creek Corridor Site documented elevated concentrations of PCBs and metals (i.e., copper, lead and zinc) in the sediment of Eighteenmile Creek and the millrace adjacent to the Former Flintkote Plant Site. The Remedial Investigation also documented contaminated sediment in the New York State Barge Canal immediately upstream of Eighteenmile Creek, and contaminated fill at Upson Park, the White Transportation property, the former United Paperboard Company property and the Former Flintkote Plant Site. The concentrations of PCBs, copper, lead and zinc detected at these areas suggest that these properties have the potential to adversely impact Eighteenmile Creek. The Remedial Investigation did not fully investigate these potential source areas, nor did it quantify the volume of contaminated sediment requiring remediation. The Remedial Investigation also determined the need to investigate deeper sediment in the creek between the canal and the Clinton Street dam, and the depositional area on the east side of the mill pond south of the dam. These data gaps need to be addressed before a Feasibility Study (FS) can be prepared for the Site. As a result, the NYSDEC recommends that a Supplemental Remedial Investigation be completed at the Eighteenmile Creek Corridor Site to

more fully determine the nature and extent of contamination in creek and millrace sediment, to further characterize the contamination at the potential source areas (i.e., the White Transportation property, the former United Paperboard Company property and Upson Park), and to determine the extent to which releases or potential releases from the site pose a threat to human health and the environment. (NYSDEC, 2006; May)

FIGURE 2-4 PCB SEDIMENT CRITERION EXCEEDANCE MAP

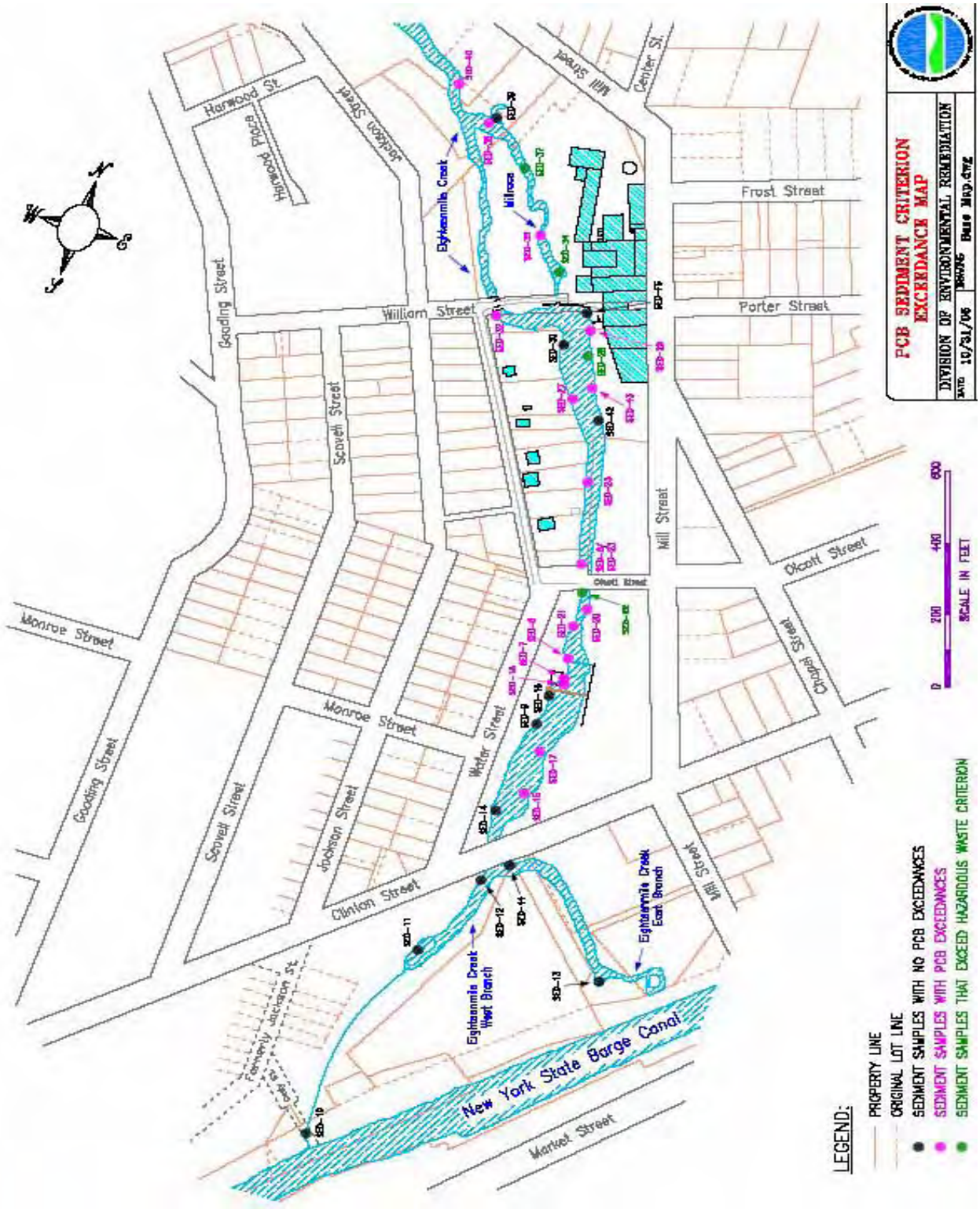


FIGURE 2-5 COPPER SEDIMENT CRITERION EXCEEDANCE MAP

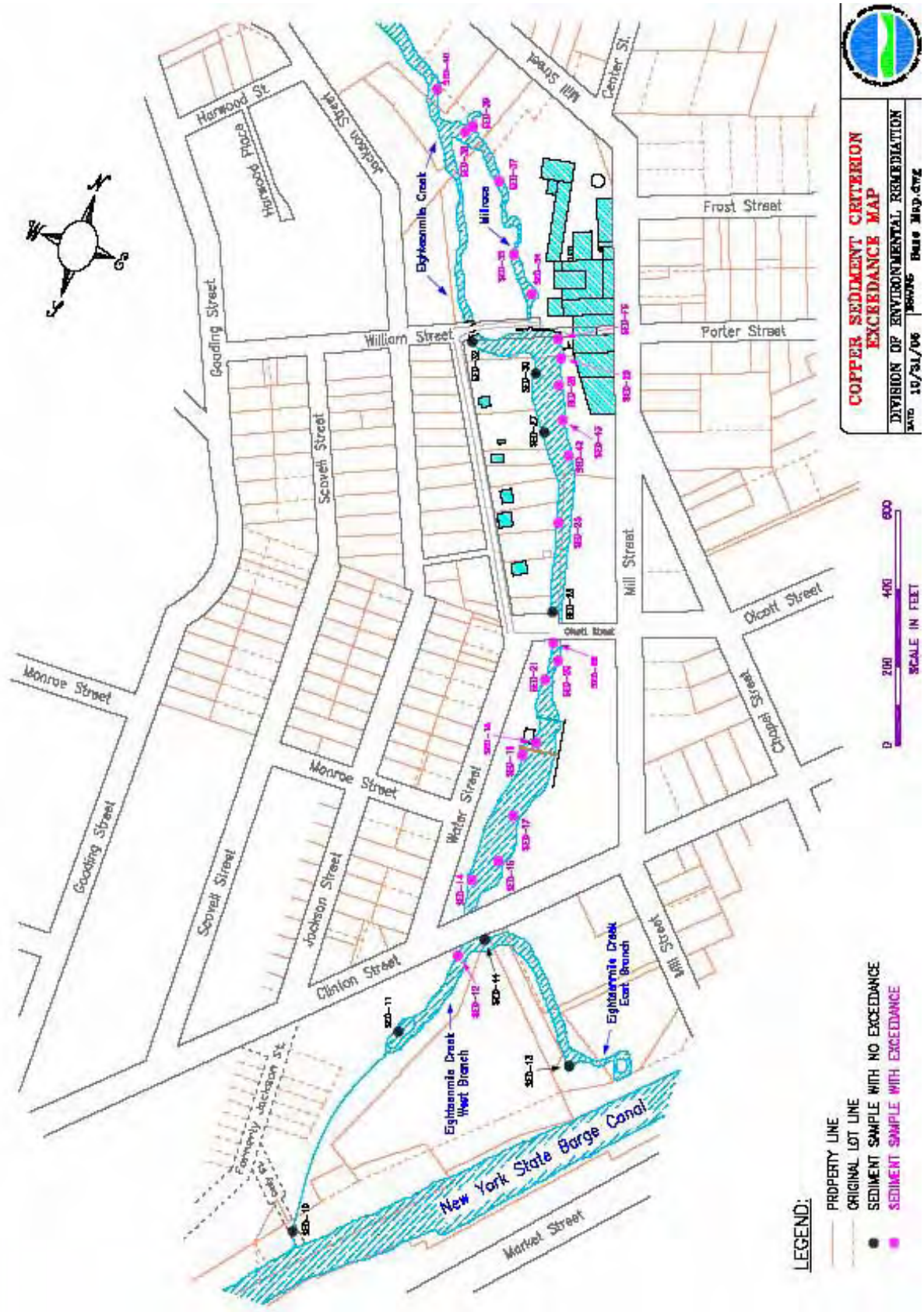


FIGURE 2-6 LEAD SEDIMENT CRITERION EXCEEDANCE MAP

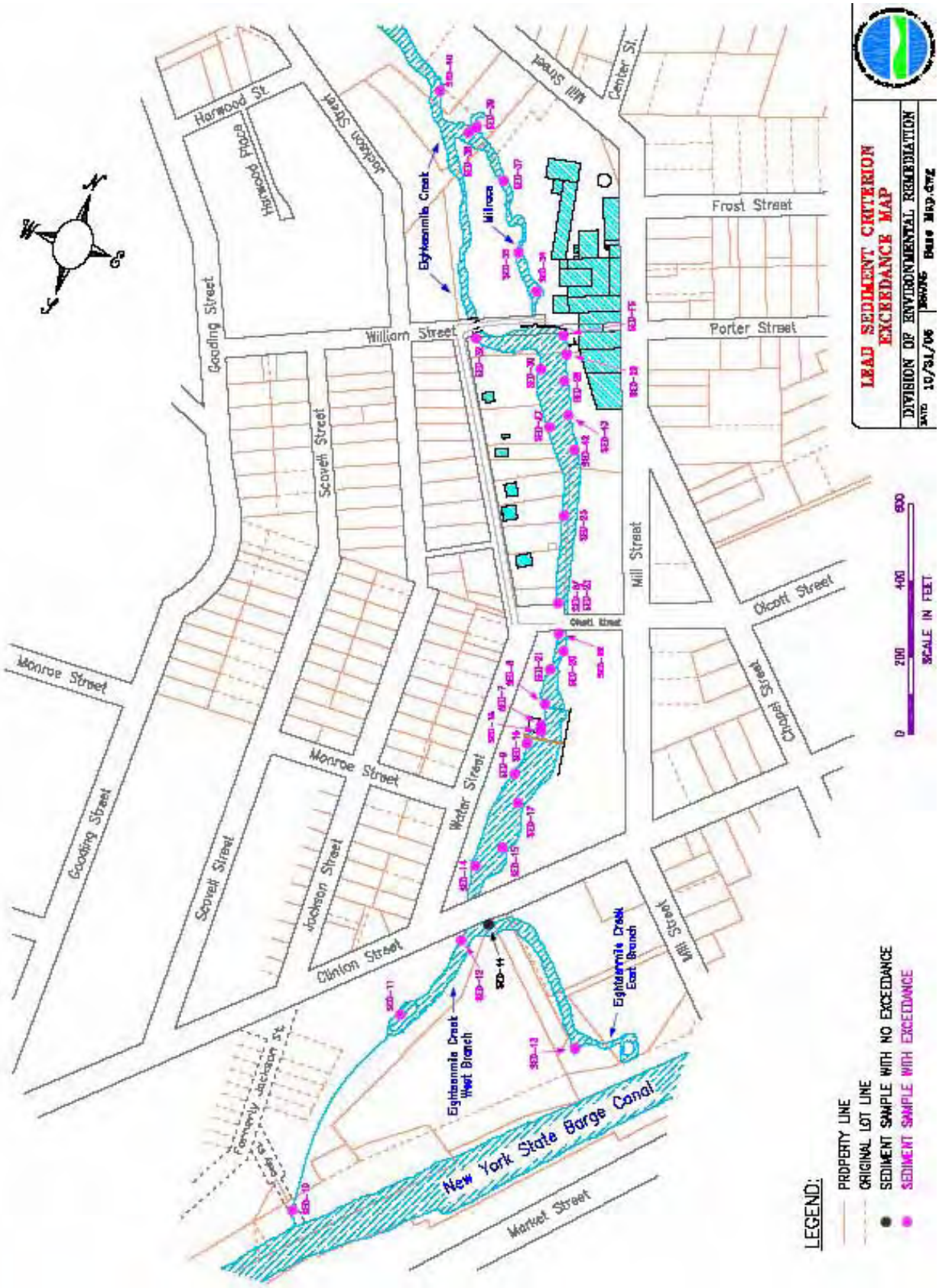
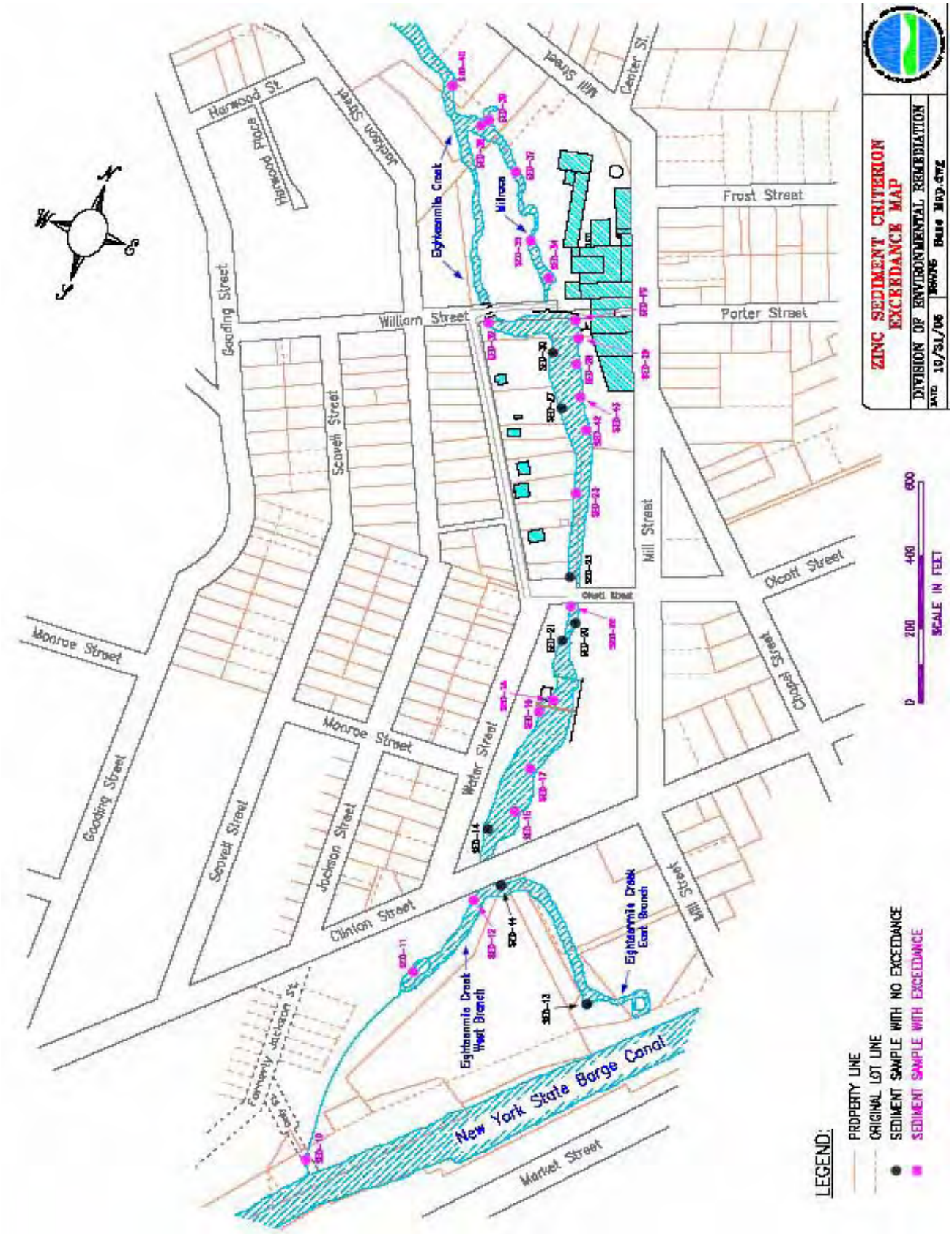


FIGURE 2-7 ZINC SEDIMENT CRITERION EXCEEDANCE MAP



2.5 EIGHTEENMILE CREEK PCB SOURCE TRACKDOWN PROJECT

In an effort to supplement the efforts of the NYSDEC investigations within the Eighteenmile Creek Corridor Site, A PCB source trackdown project was initiated downstream of the corridor site. In 2006, sediment core sampling in Eighteenmile Creek was conducted from Harwood Street to Stone Road (8,000 ft). Approximately 2,000 feet of creek within this area was not investigated as the gradient of the creek cascading down the Niagara Escarpment is too steep to assure safety to field sampling crews. Also, the amount of sediment in this area available for sampling is minimal due to the swift moving water.

Samples were collected for PCB screening using grab samples at 80 locations throughout the study area. A total of 80 samples and three duplicates were collected. Concentrations ranged from 59 ug/kg to 4300 ug/kg and 29 samples were non-detect. Comparison of PCB screening results to PCB confirmation samples at other sites, indicate the screening results need to be corrected by a factor of 6.5 to be comparable to the confirmation results. A total of 12 cores were collected in areas for PCB confirmation. Three samples were collected at various depths. The concentrations in the core samples range from 12 ug/kg to 69000 ug/kg and only six samples were non-detect.

The PCB results show that PCBs are present in all areas of Eighteenmile Creek. The core sample results show a general decrease in concentration with depth. The results indicate that the sediment is entirely contaminated with PCBs and only the native material in the creek bed is free of PCB contamination. The positive PCB results were corrected for an average total organic carbon (TOC) concentration and compared to NYSDEC criteria. Most of the positive PCB results exceeded PCB screening criteria. The results show a relatively uniform concentration of PCBs except at areas close to the Flintkote property and in the area near the intersection of Old Niagara and Plank Road. The results indicate the potential for an additional source of PCBs in an area north of the waste water plant.

The surface samples from all 12 cores also were analyzed for select metals. The metals results were compared to NYSDEC TAGM 4046 standards. All metal concentrations were near or exceeded TAGM criteria. The highest metals were found in core 2 and core 12, but the concentrations were relatively uniform throughout the study area. The results indicate that metals continue to be a source of concern in the creek and need to be evaluated relative to background concentrations in other areas.

TABLE 2-1 PCB CORE SAMPLE COMPARISON WITH SEDIMENT CRITERIA

Sediment Screening Criteria Calculations Eighteen Mile Creek PCB Trackdown

SEDIMENT PCB COMPARISON CORE SAMPLES WITH SEDIMENT CRITERIA - TOC CORRECTED

				Human Health		*Benthic Aquatic Life Acute Toxicity*			*Benthic Aquatic Life Chronic Toxicity*			*Wildlife Bioaccumulation*		
Client ID	Compound	Result	TOC	Sediment Criteria	Site Specific Criteria	Water Criteria	Sediment Criteria	Site Specific Criteria	Water Criteria	Sediment Criteria	Site Specific Criteria	Water Criteria	Sediment Criteria	Site Specific Criteria
		ug/kg	gOC/kg	(ug/gOC)	(ug compound/kg sediment)	(ug/l)	(ug/gOC)	(ug compound/kg sediment)	(ug/l)	(ug/gOC)	(ug compound/kg sediment)	(ug/l)	(ug/gOC)	(ug compound/kg sediment)
Fresh Water	PCBs (total)	Avg All Other Cores	52.86	0.0008	0.042288	2	2760.8	145935.888	0.014	19.3	1020.198	0.001	1.4	74.004
Fresh Water	PCBs (total)	Core 1 Only	8.63	0.0008	0.006904	2	2760.8	23825.704	0.014	19.3	166.559	0.001	1.4	12.082
EMC-C-01-SD-A	PCBs (total)	4300			X						X			X
EMC-C-01-SD-B	PCBs (total)	16			X									X
EMC-C-01-SD-C	PCBs (total)	0												
EMC-C-02-SD-A	PCBs (total)	5400			X						X			X
EMC-C-12-SD-A	PCBs (total)	2050			X						X			X
EMC-C-12-SD-B	PCBs (total)	0												
EMC-C-12-SD-C	PCBs (total)	0												
EMC-C-02-SD-B	PCBs (total)	4500			X						X			X
EMC-C-02-SD-C	PCBs (total)	96			X									X
EMC-C-03-SD-A	PCBs (total)	7100			X						X			X
EMC-C-03-SD-B	PCBs (total)	22			X									
EMC-C-03-SD-C	PCBs (total)	0												
EMC-C-04-SD-A	PCBs (total)	1830			X						X			X
EMC-C-04-SD-B	PCBs (total)	4100			X						X			X
EMC-C-04-SD-C	PCBs (total)	0												
EMC-C-05-SD-A	PCBs (total)	1290			X						X			X
EMC-C-05-SD-B	PCBs (total)	680			X									X
EMC-C-05-SD-C	PCBs (total)	3700			X						X			X
EMC-C-06-SD-A	PCBs (total)	0												
EMC-C-06-SD-B	PCBs (total)	366			X									X
EMC-C-06-SD-B	PCBs (total)	910			X									X
EMC-C-06-SD-C	PCBs (total)	12			X									
EMC-C-07-SD-A	PCBs (total)	14300			X						X			X
EMC-C-07-SD-B	PCBs (total)	25900			X						X			X
EMC-C-07-SD-C	PCBs (total)	50000			X						X			X
EMC-C-08-SD-A	PCBs (total)	53000			X						X			X
EMC-C-08-SD-B	PCBs (total)	37000			X						X			X
EMC-C-08-SD-C	PCBs (total)	530			X									X
EMC-C-09-SD-A	PCBs (total)	37000			X						X			X
EMC-C-09-SD-B	PCBs (total)	69000			X						X			X
EMC-C-09-SD-C	PCBs (total)	48000			X						X			X
EMC-C-10-SD-A	PCBs (total)	7760			X						X			X
EMC-C-10-SD-B	PCBs (total)	1510			X						X			X
EMC-C-10-SD-C	PCBs (total)	1100			X						X			X
EMC-C-11-SD-A	PCBs (total)	91			X									X
EMC-C-11-SD-B	PCBs (total)	36			X									
EMC-C-11-SD-C	PCBs (total)	64			X									
EMC-C-12-SD-A	PCBs (total)	2050			X						X			X
EMC-C-12-SD-B	PCBs (total)	0												
EMC-C-12-SD-C	PCBs (total)	0												

TABLE 2-2 METALS CORE SAMPLE COMPARISON WITH TAGM SEDIMENT CRITERIA

Analyte	TAGM 4406	EMC-C-1-SD-A	EMC-C-2-SD-A	EMC-C-3 SD-A	EMC-C-4-SDA	EMC-C-5 SD-A	EMC-C-6 SD-A	EMC-C-7 SD-A	EMC-C-8 SD-A	EMC-C-9 SD-A	EMC-C-10 SD-A	EMC-C-11 SD-A	EMC-C-12 SD-A
Arsenic – Total	7.5	7	**9.4**	**15.1**	5.6	5.8	**10.9**	**12.4**	6.5	7.1	**8.8**	**10.6**	**31.3**
Chromium – Total	10	**118**	**612**	**63.4**	**135**	**77.4**	**21.**	**83.6**	**113**	**108**	**200**	**67.9**	**268**
Copper - Total	25	**340**	**1150**	**294**	**1320**	**1030**	**80**	**1720**	**458**	**771**	**859**	**511**	**1040**
Lead-Total	53	**535**	**1630**	**282**	**300**	**426**	**246**	**531**	**558**	**600**	**1270**	**1010**	**892**
Mercury-Total	0.1	**0.65**	**1.3**	**0.61**	**0.35**	**0.29**	**2.5**	**0.6**	**0.88**	**1.1**	**17.4**	**6**	**1.8**
Zinc - Total	20	**1040**	**4540**	**426**	**427**	**430**	**198**	**1600**	**927**	**770**	**1530**	**1150**	**4050**

**Bold and highlighted values exceed NYSDEC TAGM criteria. All values are in ug/l (ppb).

3.0 WATER QUALITY

The Eighteenmile Creek Area of Concern is classified as a class C stream from the Burt Dam to just upstream of the Route 18 Bridge in the Village of Olcott. This indicates that the highest intended use of this reach is fish propagation. From just upstream of the Route 18 Bridge to the harbor outlet to Lake Ontario, the creek is classified as a class B stream which indicates the highest use is primary contact recreation (swimming). Each classification carries with it a set of water quality standards which the stream must meet to be used as it is intended. The standards describe the chemical, physical, and biological characteristics necessary to achieve the designated uses.

There have been numerous water quality studies completed and initiatives pursued on Eighteenmile Creek in recent years. The following section documents those efforts from 2002 to 2006.

3.1 NYSDEC ROTATING INTENSIVE BASIN STUDY (RIBS)

NYSDEC Division of Water monitors the overall health of New York's waterways under the Rotating Intensive Basin Study (RIBS) program. Over a three year cycle, this program includes analyses of water and sediment samples for chemical contaminants as well as toxicity tests and macroinvertebrate sampling for both chemical contamination and species diversity. Eighteenmile Creek will be included as a RIBS site every five to six years. The creek was included in the 1988-1990 round of sampling as well as the 2000-2002 sampling cycle. In 2002, water quality was assessed as slightly impacted at the Jacques Road sampling station. Impact source determination indicated municipal/industrial inputs to be a probable cause of the impact. This represents an apparent improvement from 1990, when water quality was assessed as moderately impacted at this site. The appearance of the pollution-sensitive riffle beetle *Optioservus*, was an indicator of improved water quality. Future sampling is needed to verify trends at this site, therefore the creek will be included in the 2005-2007 sampling cycle. (NYSDEC, 2005)

3.2 INDUSTRIAL & MUNICIPAL WASTEWATER DISCHARGES

Direct discharge of wastewater to the creek from industrial facilities and municipal wastewater treatment plants is a potential source of contaminants to Eighteenmile Creek (RAP, 1997) NYSDEC regulates these discharges through the State Pollutant Discharge Elimination System (SPDES) program. SPDES permits specify the allowable volume, contaminant concentrations and physical characteristics (temperature and pH) of the discharge as well as reporting and monitoring requirements.

There are three industrial and two municipal facilities currently permitted to discharge to Eighteenmile Creek

The permitted discharges include: Delphi Harrison Thermal Systems; City of Lockport Wastewater Treatment Plant; Gasport Sewer District #1 Wastewater Treatment Plant; ISOCHEM, Inc.; and Redlands Quarries NY, Inc (Table3-1). These facilities contribute effluents to the creek system that could contain metals, organics, suspended solids, and coliform and could cause fluctuations of biochemical oxygen demand (BOD), temperature, and pH. However, this effluent is monitored per the requirements of current SPDES permits for these facilities, which list effluent limitations and monitoring requirements that must be adhered to avoid violation of water quality standards.

Other permitted industrial effluent that enters the Eighteenmile Creek drainage basin includes stormwater discharges from eleven facilities. Stormwater discharges only require a stormwater management plan and are not routinely monitored for physical and chemical parameters. Runoff from a storm event could affect water quality as there may be residual contaminants and other physical conditions such as increased BOD and high turbidity.

TABLE 3-1 FACILTIES PERMITED TO DISCHARGE TO EIGHTEENMILE CREEK

FACILITY	SPDES PERMIT #	ORIGINAL PERMIT ISSUED	PERMIT EXPIRATION
ISOCHEM, Inc.	NY0204323	5/4/1990	2/1/2010
Delphi Harrison Thermal Sys	NY0000558	3/4/1977	1/3/2009
Redland Quarries NY	NY0003077	7/1/1976	1/6/2007
City of Lockport WWTP	NY0027057	12/31/1974	10/31/2011
Gasport SD#1 WWTP	NY0029963	6/30/1975	7/1/2007

3.3 COMBINED SEWER OVERFLOWS

The City of Lockport combined sewer system periodically discharges untreated stormwater overflow into Eighteenmile Creek during periods of significant precipitation. Over the past 25 years, 19 of the City's original 32 combined sewer overflows have been separated by installing new sewer line for either the sanitary or storm flow system. Six of the remaining 13 combined sewer outfalls have the potential to discharge to Eighteenmile Creek. The remaining 7 outfalls have the potential to discharge into the Erie Barge Canal. (See Table 3.2) Since Eighteenmile Creek receives constant augmented flow from the Erie Barge Canal, all of the remaining 13 outfalls have the potential to negatively affect Eighteenmile Creek. The locations of these remaining outfalls are illustrated in Figure 3-1.

Since 2002, three projects within the City of Lockport sewer system were developed and funded by the New York State Clean Water/Clean Air Bond Act for the reduction of combined sewer overflows. The Ohio-Simonds Sewer Project constructed new storm sewers in the west central portion of the city resulting in separation of stormwater

from the combined sewer system. The Wastewater Treatment Plant Improvement Project constructed a new clarifier at the treatment plant to increase the capability to treat wet weather flows from the combined sewer system. The Exchange Street Overflow Elimination Project eliminated combined sewers from discharging into the Eighteenmile Creek culvert. A new drill hole was made into an existing interceptor sewer tunnel constructed at the intersection of Exchange and Market Streets. A total of about 425 feet of 15" and 24" sewer pipe was installed. This sewer pipe will convey sewer flows from an existing diversion chamber to the interceptor sewer tunnel.

To be in compliance with its SPDES permit, the City of Lockport has completed a draft Monitoring Plan for CSOs and CSO Impacts. Preliminary results of the CSO Monitoring Plan revealed 20 direct connections of raw sewage to Eighteenmile Creek. Construction activities to redirect the flow to the sewer system were immediately completed by the City. In addition, the City identified additional direct connections on Stevens Street. When the Ohio-Simonds project was completed, apparently the contractor inadvertently connected four house service laterals directly to the storm sewer which discharges directly to the Barge Canal. Once identified, the sewer laterals were correctly routed to the sanitary sewer. This work was completed in September 2006. (CHA, 2006)

In 2006 the City of Lockport began monitoring activities to show NYSDEC and EPA that the 13 remaining outfalls don't need to be separated. The City believes that the majority of the flow is conveyed to the Wastewater Treatment Plant and not into Eighteenmile Creek and the Erie Barge Canal. (Lockport Journal, 2006) In order to get a reprieve from the standing order to correct the system, monitors are being installed in the sewer system to show that at least 85% of the flow during a rain event is being conveyed to the treatment plant. The monitoring activities are expected to commence through early 2007.

TABLE 3-2 CITY OF LOCKPORT COMBINED SEWER OUTFALLS

OUTFALL #	OUTFALL LOCATION	LATITUDE	LONGITUDE	STREAM
002	East of Jackson St., North of William St.	43 10' 54" N	78 41' 27" W	Eighteenmile Creek
005	Pine St. Service Road	43 10' 15" N	78 41' 35" W	Erie Barge Canal
006	Between Niagara St. and Richmond St.	43 10' 12" N	78 41' 43" W	Erie Barge Canal
007	Between Cottage St. and Main St.	43 10' 11" N	78 41' 41" W	Erie Barge Canal
008	West Main St.	43 10' 08" N	78 41' 46" W	Erie Barge Canal
011	Prospect St.	43 09' 51" N	78 42' 07" W	Erie Barge Canal
014	State Rd.- 1150 Ft. South of Nichols St.	43 09' 30" N	78 42' 27" W	Erie Barge Canal
018	Market St/Between houses # 471 & 485	43 10' 50" N	78 40' 49" W	Erie Barge Canal
019	Garden St.	43 10' 32" N	78 41' 06" W	Eighteenmile Creek
020	Spring St./Union St.	43 10' 30" N	78 41' 01" W	Eighteenmile Creek
023	#208 East Ave.	43 10' 23" N	78 40' 53" W	Eighteenmile Creek
024	Carlton Pl.	43 10' 18" N	78 40' 50" W	Eighteenmile Creek
034	East Ave./Cave St.	43 10' 22" N	78 40' 55" W	Eighteenmile Creek

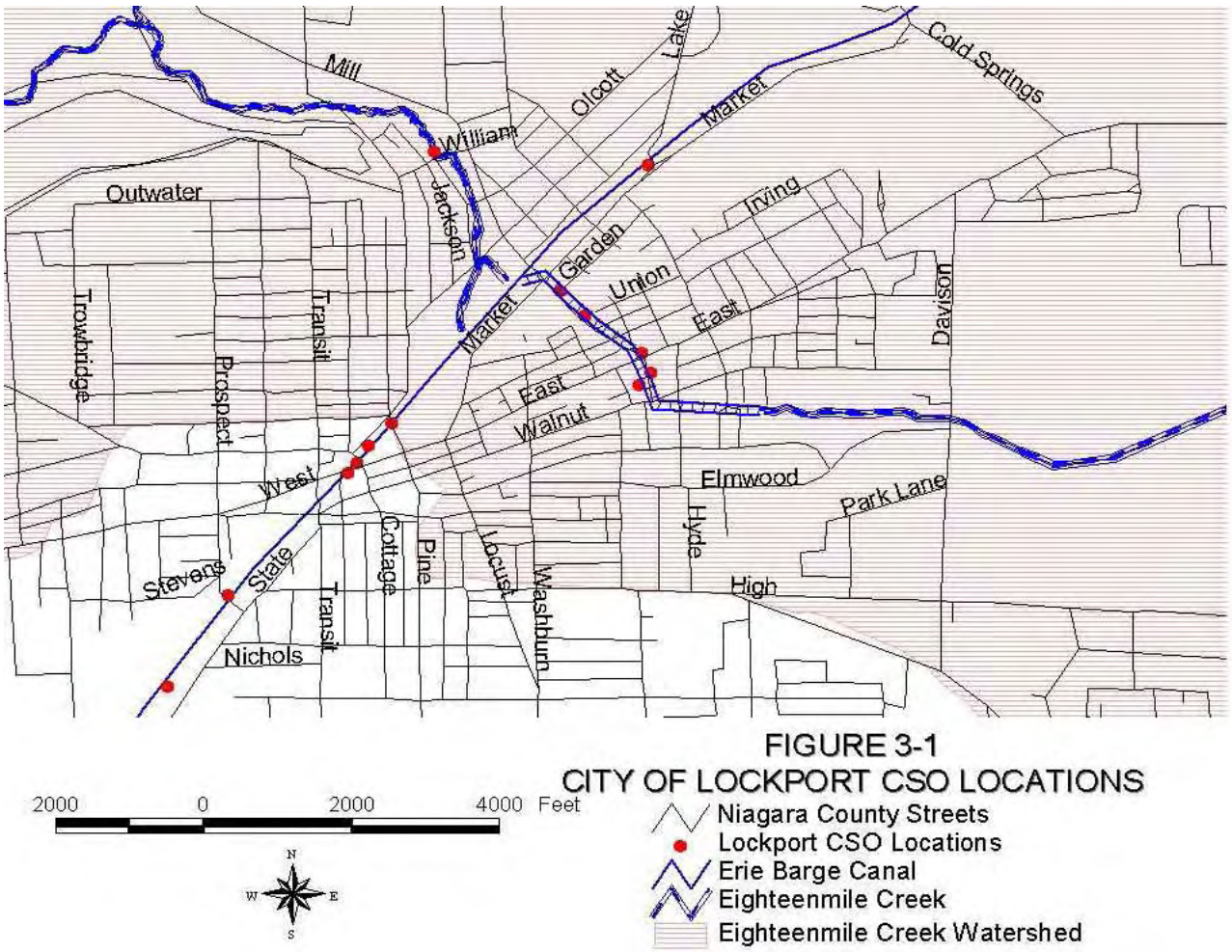


FIGURE 3-1
CITY OF LOCKPORT CSO LOCATIONS

3.4 LAKE ONTARIO TRIBUTARY INVESTIGATION

In 2002, Region 2 of the Environmental Protection Agency began a 3 year water quality investigation which included Eighteenmile Creek and four other major tributaries to Lake Ontario. The purpose of the investigation was to document loading rates of six critical pollutants identified within the Lake Ontario Lakewide Management Plan (LAMP). The LAMP identified the following critical pollutants because of their toxicity, persistence in the environment, ability to bioaccumulate, and their negative impacts to lakewide beneficial use impairments: PCBs, mercury, DDT, mirex, dieldrin, and dioxins. (Coleates, 2006) Table 3-3 documents the results for Eighteenmile Creek.

TABLE 3-3 EPA TRIBUTARY LOAD MONITORING RESULTS

EIGHTEEN MILE CREEK Latitude 43.333872 Longitude -78.716304 (NAD-83)									
DATE >>>			4/16/2002	9/17/2002	5/6/2003	7/9/2003	10/7/2003	5/11/2004	9/28/2004
Flow Estimated**	mgd		58	58	58	58	58	58	58
	cfs		90	90	90	90	90	90	90
pH	su		7.67	7.67	8.09	7.58	8.05	8.21	8.16
Temperature	°C		15	20.4	12.9	25.1	11.9	14.7	17.2
TSS	mg/L		9.0	1.1	6.7	2.0	1.3	6.0	Lab Error
	kg/day		1,978	242	1,473	440	286	1,319	
DDD (o,p' + p,p')	ng/L		U (5.5)	U (5.0)	U (5.5)	U (5.5)	U (5.3)	U (5.2)	U (5.3)
	g/day								
	kg/year								
DDE (o,p' + p,p')	ng/L		U (5.5)	U (5.0)	U (5.5)	U (5.5)	U (5.3)	U (5.2)	U (5.3)
	g/day								
	kg/year								
DDT (o,p' + p,p')	ng/L		U (5.5)	U (5.0)	U (5.5)	U (5.5)	U (5.5)	U (5.5)	U (5.3)
	g/day								
	kg/year								
Total DDT	ng/L		U	U	U	U	U	U	U
	g/day								
	kg/year								
Dieldrin	ng/L		U (5.5)	U (5.0)	U (5.5)	U (5.5)	U (5.3)	U (5.2)	U (5.3)
	g/day								
	kg/year								
Mirex	ng/L		U (2.7)	U (3.0)	U (2.7)	U (2.7)	U 2.6)	U (2.6)	U (2.6)
	g/day								
Total Mercury	ng/L		12.4	0.863	4.53	1.43	1.3	4.6	1.35
	g/day		2.73	0.19	1.00	0.31	0.29	1.01	0.30
	kg/year		0.99	0.07	0.36	0.11	0.10	0.37	0.11
Total PCBs	pg/L		35,704	32,480	29,612	38,652	21,531	51,325	39,525
	g/day		7.85	7.14	6.51	8.50	4.73	11.28	8.69
	kg/year		2.86	2.61	2.38	3.10	1.73	4.12	3.17
Dioxins TEQ	pg/L		U	13.9	0.016	U	U	NA	NA
	g/day								
Mercury Field Blank	ng/L		0.259	0.225	0.304	0.266	0.359	0.543	0.275

	QUALIFIERS:	U - Analyte not detected. Reporting limit is given in parentheses.
		QB- Data should not be used because concentration is indistinguishable from field blank. (ie less than three times blank concentration)
		** - There is no permanent gaging station on Eighteen Mile Creek. An approximate base flow of 90 cfs is used to calculate approximate loadings. If better flow estimates become available, loadings should be recalculated.
		NA - Not analyzed for this parameter
		Total DDT - The sum of DDD + DDE + DDT.

3.5 EIGHTEENMILE CREEK WATERSHED NUTRIENT AND SOIL LOSS INVESTIGATION

In July 2003, the Niagara County Soil & Water Conservation District (NCSWCD), in conjunction with the Department of Environmental Science and Biology at SUNY Brockport, began a monitoring program for Eighteenmile Creek. Eighteenmile Creek was monitored for two annual cycles from August 1, 2003 through July 31, 2005. The NCSWCD began collecting data needed to accurately characterize the water quality in the creek and to quantify the concentration and loading of nutrients and suspended sediments transported from Eighteenmile Creek to Lake Ontario. Identifying the magnitude of soil and nutrient losses from this watershed will allow the determination of the health of the creek and its impact to Lake Ontario. Monitoring of water quality in the creek was performed via a fixed monitoring station and grab samples. Sampling parameters included total phosphorus, total suspended solids, sodium, nitrate, nitrite, and total kjeldahl nitrogen.

The results of this investigation show that Eighteenmile Creek is moderately to severely impacted with respect to phosphorus loss from its watershed when compared, on an areal basis, with other watersheds in western and central New York State. Within Niagara County, Eighteenmile Creek's areal phosphorus loss is nearly six times that of Twelvemile Creek West and over 12 times that of Twelvemile Creek East. The non-event total phosphorus concentration was also very high when compared to other watersheds that have a very heavy agricultural presence or receive discharge from a sewage treatment plant.

The City of Lockport's sewage treatment plant is having an impact on the water quality of Eighteenmile Creek. The treatment plant is contributing a large amount of phosphorus to the creek and creating a biochemical oxygen demand that is lowering the pH and dissolved oxygen in that portion of the watershed. Non-event loadings of total phosphorus, nitrate, total Kjeldahl nitrogen, and sodium are nearly equal to or greater than event loadings, most likely due to the continuous input from the treatment plant.

The mean total suspended solids (TSS) event concentration (26.3 mg/L) was nearly double the mean TSS concentration during non-event conditions (15.0 mg/L) in Eighteenmile Creek. Total suspended solids or soil was lost from the Eighteenmile Creek watershed at a rate of 10,989 kg/day during the two year period encompassing August 1, 2003 to July 31, 2005. On an areal basis, TSS was lost at a rate of 369 g/ha/day during the period August 1, 2003 to July 31, 2004 and a rate of 567 from August 1, 2004 to July 31, 2005. Forty six percent of the TSS loss occurred during the winter seasons followed by spring (29%), summer (16%) and autumn (9%). Of all the parameters measured in Eighteenmile Creek, the loss of total suspended solids was the most affected by hydrometerological events. Seventy percent of total suspended solids loss occurred when Eighteenmile Creek was in event conditions. This is not surprising as the increased water flowing over land in the watershed erodes soil and picks up solids and carries them to the creek.

As expected the dam at Burt, NY is slowing down the Creek's flow allowing solids to settle out resulting in a significant decrease in total suspended solids concentrations below the dam versus the sampling sites above the dam. (Makarewicz, et al. 2006)

3.6 EIGHTEENMILE CREEK SOIL WATER ASSESSMENT TOOL (SWAT)

In 2005, Buffalo State College in conjunction with U.S. Army Corps of Engineers, Buffalo District, implemented the Soil Water Assessment Tool (SWAT) for the Eighteenmile Creek watershed. Under Section 516(e), Water Resources Development Act of 1996, as amended, the corps is directed to apply sediment transport models to tributaries of the Great Lakes that discharge to Federal navigation channels or Areas of Concern (AOCs). These models are being developed to assist state and local resource agencies evaluate alternatives for soil conservation and non-point source pollution prevention in the tributary watersheds. The ultimate goal is to support state and local measures that will reduce the loading of sediments and pollutants to navigation channels and AOCs, and thereby reduce the costs for navigation maintenance and sediment remediation.

The SWAT model was implemented for the Eighteenmile Creek watershed to determine annual sediment yields and critical source areas of erosion in the watershed. A stochastic approach was used to calibrate the hydrologic component of the model since the watershed did not have any real time U.S. Geological Survey gage stations. Model simulated monthly runoff ratios for Eighteenmile were compared against measured runoff ratios for two adjacent watersheds – the Tonawanda and Cayuga Creek watersheds. Sediment calibrations were performed by comparing model simulated daily sediment concentrations against measured suspended sediment concentrations for two sites in the watershed. Sediment monitoring was performed by continuously-recording YSI sondes and grab sampling for suspended sediment. Sediment data was collected for the period August 2004 – November 2005.

There was considerable spatial variation in sediment generation within the Eighteenmile Creek watershed with a range of 0.22-5.52 tons ha-1yr-1. A group of agricultural sub-basins on the southwestern end of the watershed generated the highest sediment yields and should be targeted for implementation of best management practices. (Inamdar, 2005)

3.7 EIGHTEENMILE CREEK AGRICULTURAL ENVIRONMENTAL MANAGEMENT

In 2005, NCSWCD began implementing the Agricultural Environmental Program (AEM) in the Eighteenmile Creek watershed. AEM is a voluntary, incentive-based program that helps farm operators make common-sense, cost-effective and science-based decisions that help meet business objectives while protecting and conserving the State's natural resources. (NYS Ag & Markets, 2006)

In response to various environmental concerns statewide, the AEM Program has been developed by farmers, every level of government, and farm conservation professionals. It uses existing environmental planning processes and tested approaches to solve and prevent numerous environmental problems. In short, AEM establishes a coordinated framework for protecting and improving the environment off and on the farm, while maintaining the viability of farming as a commercial enterprise.

NCSWCD has been conducting farm assessments and evaluating water quality concerns throughout the watershed since 2005. Since then, various resource concerns have been identified and ranked for the watershed. (Table 3-4) To address these resource concerns NCSWCD has applied for and received funds from New York States Agricultural & Non-Point Source Abatement Program to implement Best Management Practices (BMPs) on high priority farms. In 2007, the following projects are scheduled for completion on 3 farms with water quality concerns: silage leachate control system; barnyard runoff system; and a milk center waste system.

TABLE 3-4 EIGHTEENMILE CREEK AEM RESOURCE CONCERNS

RANK	CONCERN	REFERENCE SOURCE
1	Water Quality	Priority Waterbodies List (PWL), Water Quality Strategy
2	Contaminated Sediment	PWL
3	Urban Runoff	PWL, SUNY Brockport
4	Agricultural Runoff	Water Quality Strategy
5	Combined Sewer Overflows	PWL
6	Land disposal	PWL
7	Impaired fish consumption and fishing	PWL

3.8 WATER QUALITY MONITORING PROJECT

In 2006, NCSWCD began monitoring major creeks within the county, including Eighteenmile Creek for baseline and storm event sediment and nutrient load as well as BOD and temperature. Baseline monitoring was completed on a monthly basis in addition to sampling of four storm events. The results will be used to identify those creeks in need of further study, to provide scientific data to update the Priority Waterbodies List and to identify problems and prioritize local projects. The monitoring of water quality in the creek was performed via grab samples. Sampling parameters included total phosphorus, total suspended solids, sodium, nitrate, nitrite, and total kjeldahl nitrogen. The project is expected to be conducted over two calendar years.

4.0 FISH & WILDLIFE

Eighteenmile Creek is one of about ten major tributaries in the Great Lakes Plain ecological region. The extensive beds of emergent and submergent aquatic vegetation in this area account for an estimated 65 acres, comprising one of the largest coastal wetlands in the western portion of Lake Ontario. Eighteenmile Creek is particularly significant because large concentrations of Coho and Chinook salmon and brown trout migrate from Lake Ontario into the creek each fall, from late August through December. In addition, steelheads migrate into Eighteen Mile Creek during the fall and between late February and April.

Eighteen Mile Creek also contains a diverse warm-water fishery. The area supports substantial natural reproduction by smallmouth bass, northern pike, rock bass, black crappie, brown bullhead, and largemouth bass. The wetlands and undisturbed woodlands bordering Eighteenmile Creek provide valuable habitats for wildlife that are uncommon in Niagara County's coastal area. A variety of bird species inhabit the area, including great blue heron, green-backed heron, mallard, wood duck, belted kingfisher, marsh wren, common yellowthroat, red-winged blackbird, and swamp sparrow. Other wildlife species occurring along the creek include resident furbearers, such as muskrat, mink, and raccoon.

The fish and wildlife resources associated with Eighteenmile Creek attract a significant amount of recreational use, although access to the area is limited by the steep banks and private land ownership. This is one of the most popular recreational fishing streams on western Lake Ontario, due primarily to the large salmonid runs in the area. Fishing pressure is concentrated in the upper 0.25 mile area between Fisherman's Park access sites and Burt Dam and in the vicinity of Olcott Harbor. The intervening segment of the creek is often fished by small boat or canoe, especially for the abundant warm-water species in the area. (NYSDEC, 1984)

4.1 EIGHTEENMILE CREEK AOC PLANKTONIC COMMUNITY STUDY

In 2002, SUNY College at Brockport began a study that would characterize the health of the planktonic community in the Eighteenmile Creek AOC. To assess the status of a potential impairment, characteristics describing the plankton community structure, such as abundance, species composition, species richness and dominance were collected. Such measures of the plankton community at Eighteenmile Creek were compared to results of previously studied community structure data from several reference sites: minimally polluted creeks on the south shore of Lake Ontario (Yanty, Salmon, Buttonwood), a historically eutrophic impacted river system (Oswego River AOC), the near shore and offshore waters of Lake Ontario, and from several habitats (submergent, pond) located in Braddock Bay and Yanty Creek Marsh on Lake Ontario.

The evidence suggests that the plankton community of Eighteenmile Creek is not impacted by contaminants. The summer zooplankton community of Eighteenmile Creek had similar or higher species richness, a remarkably similar measure of dominance (i.e., evenness) and in July, comparable abundance to the relatively pollution-free reference sites at Yanty, Buttonwood, and Salmon Creeks. Similarly in June, zooplankton abundance, species richness, and evenness for Eighteenmile Creek were between the values for the reference sites at Yanty Creek and Buttonwood and Salmon Creeks. Species richness, evenness, abundance, and species composition of phytoplankton are similar for Eighteenmile Creek, the unpolluted reference site at Yanty Creek, and for the AOC at the Oswego River and Harbor for the months of June and August. Seasonal changes, sample timing, and local sampling site characteristics and location can be challenging to data assessment and reference site comparison; however, substantially similar and healthy communities indicate no overall degradation or impairment in the planktonic populations in the Eighteenmile Creek AOC. (SUNY Brockport, 2002)

4.2 EIGHTEENMILE CREEK AOC BASELINE HABITAT CHARACTERIZATION AND THREATENED AND ENDANGERED SPECIES INVESTIGATION

In 2002, Niagara County and Ecology and Environment, Inc. began to characterize the baseline conditions of the reverie ecosystem and existence of threatened and endangered species within the AOC. One New York State threatened species was observed, the Blanding's Turtle. Various other wildlife and plant species were also observed. Wildlife species observed included: mallards, wood duck, belted kingfisher, pileated woodpecker, American crow, great blue heron, green heron, turkey vulture, Coopers hawk, red-winged black bird, mourning dove, and the eastern grey squirrel. Multiple fish and invertebrate species were observed including: Chinook salmon, largemouth bass, smallmouth bass, pumpkinseed, yellow perch, carp, fathead minnow, crayfish, and zebra mussels. Other species observed included the eastern painted turtle, green frog, bull frog, and the northern leopard frog. Some invasive plants were found to occur within the AOC as well. They included: mugwort, garlic mustard, giant hogweed, purple loosestrife, common reed, glossy buckthorn, and common buckthorn. All of these species are non-native to the region and can be ecologically damaging to native plant communities. (2003, E&E Inc.)

Habitat characterizations were separated into two sections of the AOC, based upon creek channel characteristics. Below Burt Dam, there is a relatively short section of creek with flowing water. The remainder of the AOC to its confluence with Lake Ontario non-flowing to slightly flowing water, depending upon Lake levels, as well as upstream discharge. Available cover for fish includes: deep water, boulders, aquatic vegetation, large woody debris, and flowing water.

Riparian and wetland habitats were also characterized. They include: severely eroded sloping trails, bottomland forest, depressional wetland, meandering streambanks, numerous island features, a series of emergent marshes with

backwater slough areas and exposed, partially vegetated slopes at water's edge adjacent to some of the marsh features.

4.3 EIGHTEENMILE CREEK STREAMBANK STABILIZATION AND HABITAT RESTORATION PROJECT – PHASE I

This 2003 project was designed to be the first critical step in creating sustainable fisheries in, and improving access to, Eighteenmile Creek. The goal of the project was to: improve the habitat for coldwater fish species immediately below the Burt Dam; to improve bank stability and provide for non-point source pollution and sedimentation control through the application of innovative stabilization and bioengineering techniques; to improve public access and safety by widening the eroding trail and stream bank; and to improve adjacent riparian and aquatic habitat by establishing bank side vegetation, a canopy of native tree species, and various aquatic habitat features. Goal and function-based design techniques utilized for this restoration project include: buried keys; patio stones for fishermen's access; a hand-placed stone ledge; a stone-step staircase; a stepped-stone wall with a pinned base level for bank protection; an uneven bank-line; exclusionary vegetation; protection of natural "leaner" trees; bent willow pole method; soil-choked rip-rap; locked limbs; locked logs; dense root mass replication; traditional wooden and cantilverted stone lunkers; tree stump habitat; hydraulic cover stones; bed diversity stones; duck resting rocks; locked branches; free branches; and an erosion control seeding. The project also included the invention of the "pushed" tree technique and spurred the inception of the term "extreme instant shade."

To guide the planting restoration efforts, a detailed planting plan was developed that divided the work into two phases: post-construction planting in the fall of 2003 and final planting in the spring of 2004. The focus of the planting plan was to select species with superior erosion control and habitat enhancement properties, and to help steer angler access to designated portions of the streambank. A variety of native species were used including streamco willow, silky willow, silky dogwood, red-osier dogwood and buttonbush. In the spring of 2004, landscape efforts were completed by enhancing the trail with wildflowers and soil stabilizing shrubs, and by reseeding all exposed surfaces.

A public outreach component of the project included: creating an educational brochure, development of a project fact sheet, holding a groundbreaking ceremony (September 2003), creating a project videotape, and hosting a 2-day educational workshop on watershed restoration (May 2004). The wide diversity of the project's partnership and overall accomplishments made it possible for the project to be awarded a New York State Governor's Waterfront Re-Discovery Award and the 2004 U.S. Department of Agriculture Team Excellence Award.

FIGURE 4-1 FISHERMEN'S PARK @ EIGHTEENMILE CREEK BEFORE PHASE I PROJECT

FIGURE 4-2 FISHERMEN'S PARK @ EIGHTEENMILE CREEK AFTER PHASE I PROJECT

4.4 EIGHTEENMILE CREEK STREAMBANK STABILIZATION AND HABITAT RESTORATION PROJECT – PHASE II

NCSWCD has secured funds to initiate Phase II of the restoration of Eighteenmile Creek below Burt Dam. The project consists of the placement of large rip rap stones along the east and west banks to re-define and narrow the channel to its former configuration, and to create a wetland area along the east shoreline. The project also plans to place additional hydraulic cover stones in the creek as well as restore wetland vegetation.

Approximately 560 lineal feet of large rip-rap stone will be placed along the east bank of Eighteenmile Creek to narrow the channel to its former configuration and to create a low flow deflector/fishing access wall. Three hundred and forty (340) lineal feet of hydraulic cover stones will be placed along the west bank of Eighteenmile Creek to better define the channel's shape and protect the wetland marsh present along said bank. Fifty (50) hydraulic cover stones will also be placed in Eighteenmile Creek north and south of an abandoned railroad trestle that intersects the creek.

The stabilization of the creek banks is necessary to prevent future bank erosion, emergent wetland degradation and to maintain safe access to the creek for fishing below Burt Dam. The re-creation of the emergent wetland area will re-establish the viable marsh habitat that once existed in this location. The overall project will involve using both "hard" (i.e., rock rip-rap wall) and "soft" (i.e., vegetative plantings) methods. Due to the extensive use of the area by anglers and water level fluctuations, bioengineering alone will not provide a sound long-term solution to prevent future bank erosion and wetland degradation. Construction of Phase II began in October 2006 and is expected to be completed by July 2007.

4.5 EIGHTEENMILE CREEK FISH STOCKING PROGRAM

The NYSDEC in conjunction with Niagara County Federation of Conservation Clubs conducts an annual fish stocking program for various bodies of water throughout Niagara County. Each year NYSDEC releases over one million pounds of fish into more than 1,200 public streams, rivers, lakes and ponds across the state. These fish are stocked for two main purposes-- to enhance recreational fishing and to restore native species to waters they formerly occupied. Table 4.1 reflects the fish stocked in Eighteenmile Creek for January 1 – December 31, 2003. (NYSDEC, 2003) Table 4.2 reflects the fish stocked in Eighteenmile Creek for January 1 – December 31, 2004. (NYSDEC, 2004) Table 4.3 reflects the fish stocked in Eighteenmile Creek for January 1 – December 31, 2005. (NYSDEC, 2005)

TABLE 4.1 – 2003 EIGHTEENMILE CREEK FISH STOCKING

SPECIES	QUANTITY	SIZE IN INCHES
CHINOOK SALMON	122,000	3.0
COHO SALMON	30,000	5.0

TABLE 4.2 – 2004 EIGHTEENMILE CREEK FISH STOCKING

SPECIES	QUANTITY	SIZE IN INCHES
CHINOOK SALMON	134,000	3.0
COHO SALMON	30,000	5.0
RAINBOW TROUT	7,000	5.0

TABLE 4.3 – 2005 EIGHTEENMILE CREEK FISH STOCKING

SPECIES	QUANTITY	SIZE IN INCHES
CHINOOK SALMON	67,100	3.0
COHO SALMON	30,000	5.0
STEELHEAD	7,000	5.0

TABLE 4.4 – 2006 EIGHTEENMILE CREEK FISH STOCKING

SPECIES	QUANTITY	SIZE IN INCHES
CHINOOK SALMON	134,200	3.0
COHO SALMON	30,000	5.0
STEELHEAD	7,000	5.0
BROWN TROUT	25,000	3.0
RAINBOW TROUT	12,500	3.0

4.6 EIGHTEENMILE CREEK PEN REARING PROJECT

In 2005, a salmon pen rearing project was initiated in Eighteenmile Creek due to concerns of post-stocking survival and imprinting of Chinook salmon and steelhead to the stocking stream. The project was sponsored by Lake Ontario Trout and Salmon Association (LOTSA), Town of Newfane, Niagara County Legislature, Niagara County Sportfishing Development Board and Slippery Sinker Bait and Tackle Shop. Two pens were used to rear Chinook salmon. The pens were located in Olcott Harbor at the Town of Newfane Marina, approximately 1/4 mile from the lake. Fifty thousand (50,000) NYSDEC raised Chinook salmon were placed into two pens in April 2005. Fish were

piped directly from the hatchery truck to the pens. Fish were fed five times each day. Water temperature was continuously monitored with a digital thermometer and temperature was recorded at feeding times. Pens were brushed every three days. Fish were monitored for growth once, approximately two weeks after stocking into pens, and a second time on the release date. On May 16th, 20 days after placing Chinook in the pens, the fish were released at the pen site. Initial weight of Chinook when placed into pens was 190 fish per lb. Chinook grew very rapidly, increasing their weight almost 2.7 times during the 20 day period. Mean weight of Chinook taken from one pen was 68.7 fish per lb and was 72.8 fish per lb from the second. (NYSDEC, 2005) Fifty thousand (50,000) Chinook salmon were also raised in the pens during the 2006 growing season. Results of the 2006 pen rearing project are anticipated in March 2007.

4.7 FALL 2005 LAKE ONTARIO TRIBUTARY CREEL SURVEY

An angler survey of all the major tributaries to Lake Ontario in New York was initiated in 2005 by the NYSDEC. Five NYSDEC technicians surveyed 28 Lake Ontario tributaries, including Eighteenmile Creek. NYSDEC estimated effort (numbers of angler hours and angler trips), catch and harvest (total numbers), and catch and harvest rates (fish per angler hour) for each species in each tributary. For angler interviews, NYSDEC recorded site, date, interview time, residency, angler party size, start time, time taken for breaks, trip status (complete versus incomplete), fishing method, species targeted, satisfaction with Lake Ontario tributary fishing regulations (very satisfied, somewhat satisfied or not satisfied), fish kept and released, weather effects, and any relevant comments made by the angler or interviewing technician. The proportion of non- NYS resident participation in the tributary fisheries was calculated individually for "high use" tributaries and collectively for groups of tributaries assigned to "medium use" and "low use" categories based on levels of estimated effort.

The total estimated effort for all 28 tributaries was 805,419 angler hours. Eighteenmile Creek accounted for 8.5% (69,111 hours) of the total angler hours calculated, ranked second behind the Salmon River which accounted for 60% of calculated angler hours. The total estimated angler trips from all 28 tributaries were 256,907. Eighteenmile Creek accounted for 12.5% (32,295 trips) of the total angler trips calculated, ranked third behind the Salmon River and Oak Orchard Creek.

A second year of the Creel Survey was initiated in September 2006 and will continue through April 2007.

4.8 EIGHTEENMILE CREEK AOC MARSH MONITORING PROGRAM

In 2006, the Environmental Protection Agency – Great Lakes National Program Office provided funding to increase wetland survey coverage in the Eighteenmile Creek AOC. To accomplish this, Bird Studies Canada (BSC) partnered with the Great Lakes Commission (GLC), NCSWCD, and the Eighteenmile Creek Remedial Advisory Committee to offer a Marsh Monitoring Program introduction and training session to 45 volunteer citizen scientists.

MMP volunteers monitor marshes and the birds and amphibians they are home to. The primary goals of this project are to develop an improved means for monitoring and reporting on the status of up to five wetland-related BUIs in AOC, and to improve long-term bi-national AOC and basin-wide volunteer monitoring of wetland habitats for the MMP. Observations of Eighteenmile Creek marshes began in March of 2006 and are expected to yield valuable results within an upcoming BSC publication.

5.0 INACTIVE HAZARDOUS WASTE SITES

During its original development, the Eighteenmile Creek RAP identified 15 inactive hazardous waste sites in the watershed. Three additional sites were identified subsequent to the completion of the RAP which included Delphi Harrison/ TCE Site, Guterl Steel/ Plant Site, and Flintkote Property (William Street Island). Currently, the NYSDEC Division of Environmental Remediation has designated the following 13 sites as 'Remediation Complete or Not Required':

1. Lockport City Landfill
   → *Remedial construction complete; Long term operation & maintenance underway.*
2. Diversified Manufacturing
   → *Delisted. No significant contamination found at the site.*
3. Dussalt Foundry
   → *Delisted. DEC sampling found no hazardous waste at this site.*
4. Harrison Radiator/Landfill
   → *Delisted. Remedial action complete; no waste remains at site.*
5. Niagara County Refuse Disposal District
   → *Long term operation & maintenance underway.*
6. Norton Labs
   → *Delisted. No significant amount of hazardous waste found at site.*
7. Van De Mark
   → *Landfill closed & groundwater monitoring ongoing.*
8. Wilson-Cambria Landfill
   → *Closure completed. Groundwater monitoring underway.*
9. Diamond Shamrock
   → *Delisted. Clay barrier installed to bedrock to prevent groundwater migration.*
10. Flintkote/Plant Site
    → *Delisted. No evidence of release to environment. 7 drums of PCB oil removed.*
11. Niagara Materials
    → *Delisted. No significant contamination of soil or groundwater revealed.*
12. Town of Lockport Landfill
    → *Delisted. No hazardous waste found at site.*
13. NYSEG Substation
    → *Delisted. Materials on site do not meet hazardous waste criteria. Containment is ongoing.*

5.1 AKZO CHEMICAL PLANT SITE

The 350 acre AKZO plant site is located in a rural, agricultural setting outside the Hamlet of Burt, Niagara County, New York. Numerous orchards, as well as small residential sections, surround and abut the facility property. To the west of the Facility is Eighteenmile Creek that flows to Lake Ontario located about 2 miles to the north. Located immediately to the north is the small Hamlet of Burt. The nearest residential homes are approximately 1500-2000 feet from the production area of the Facility. To the south and east the lands are agricultural.

AKZO produced organic peroxides including benzoyl peroxide, methyl ethyl ketone peroxide, actyl acetone peroxide, 2,4-dichlorobenzoyl peroxide, and parachlorobenzoyl peroxide at the production facility that represents approximately 30 of the 350 acre size of the ANC site. In April 2003, all chemical production ceased. Since that time, most of the buildings on-site have been razed. The AKZO site now serves as a warehouse and distribution center for their products.

AKZO has a 6NYCRR 373 Permit which requires proper closure of the hazardous waste units subject to the Permit. The permit also required that AKZO perform a RCRA Facility Assessment (RFA) and RCRA Facility Investigation (RFI) to determine the nature and extent of contamination associated with the Facility. The RFA began in 1994 and identified 37 solid waste management units (SWMUs) and 5 Areas of Concerns (AOCs). The RFI began in 1995 and was completed in 2002. The RFI determined that 31 SWMUs and the 5 AOCs required no further action. The remaining 10 SWMUs were subject to a Corrective Measures Study (CMS) or required sampling at closure.

The CMS report was submitted in May 2003 and approved in March 2004. NYSDEC has determined that the presence of contaminants in the groundwater represents a potential threat to human health and the environment. Corrective measures are required to mitigate that threat. The remedy includes: Institutional controls consisting of deed restrictions or covenants to restrict activities on the site; Monitored natural attenuation which includes a comprehensive groundwater monitoring program that will determine the long term effectiveness of natural attenuation. Evaluation of the performance objectives or achievement of groundwater standards will be performed on an annual basis to determine the effectiveness of the proposed remedy. The remedy was completed in late 2005. Long term operation and maintenance activities are currently being performed.

5.2 GUTERL STEEL LANDFILL SITE

This site consists of an 8.6 acre landfill located in the northwest corner of the Guterl Steel Mill. From 1962 to 1980, the company disposed of wastes such as slag, baghouse flue dust, foundry sand, waste oils, greases, and other plant rubbish in the landfill. In August 1980, the NYSDEC required Guterl to stop disposing baghouse dust containing chromium in the landfill, as it had become a RCRA listed hazardous waste. In 1982, Guterl salvaged 2 million pounds of metal slag from the landfill for recycling. The landfill has not been used since. A Phase I Investigation was completed in 1988, and a Preliminary Site Assessment (PSA) was completed in 1993. Groundwater samples exceeded Class "GA" standards for chromium, iron, magnesium, sodium and thallium. Soil samples showed elevated levels of chromium (3,150 ppm) and other metals. However, none of these samples failed EP Toxicity Testing. Alpha radioactivity and pH also exceeded the Class "GA" groundwater standards. Phenol and iron exceeded the Class "D" surface water standard. The groundwater flows toward the nearby Frontier Stone Company quarry. The quarry is discharging the water into the Erie Canal, immediately upstream of the intake for City of Lockport's emergency water supply. A Remedial Investigation / Feasibility Study utilizing the State Superfund Program has been initiated and NYSDEC staff are working on a RI/FS work plan. USACE is also expected to complete a radiation component to the RI/FS sometime in 2007.

5.3 GUTERL STEEL PLANT SITE

As of May 24, 2005, The Guterl Steel Plant Site (a.k.a. Simonds Saw), is now included in the Formerly Utilized Sites Remedial Action Program (FUSRAP). FUSRAP is a federal program designed to cleanup sites that became contaminated with low levels of residual radioactivity during the nation's early atomic energy program over 50 years ago.

The former Guterl Specialty Steel Corporation performed rolling mill operation on uranium and thorium metals during the period from 1948 to 1956 under contracts with the Atomic Energy Commission (AEC). In total, between 25 and 35 million pounds of uranium and approximately 30 to 40 thousand pounds of thorium were rolled from 1948 until operations were discontinued in 1956, at which time the site was decontaminated to the standards in place at that time.

In 1999, the U.S. Army Corps of Engineers completed a Preliminary Assessment (PA) of the site, which included a review of radiological data that was part of a survey prepared for the United States. Though the Corps has determined that there is no immediate health risk posed by AEC or Manhattan Engineer District (MED)- related contaminants at the site, the agency has determined that radiological contamination in excess of current federal and

state standards exist at the site. This means that there is a high probability that remedial action would be needed before any future development of the property.

Since there is the potential for contaminants to pose future problems, the Corps is working to design a sampling and analysis plan that will help them obtain additional data to determine how to minimize and control any future risks. By conducting a Remedial Investigation, the corps will better define the nature, quantity, and extent of contamination related to AEC/MED activities and to further evaluate the potential risks to human health and the environment.

The Corps will follow the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) process for site investigation, and if necessary, site remediation. This process outlines the steps that must be taken to reach a final decision for each site and requires open involvement between the Corps, regulators, stakeholders and the community. Under CERCLA, a Remedial Investigation follows a Preliminary Assessment.

The Corps' Preliminary Assessment of the Guterl Site also indicated that there may be significant quantities of other contaminants unrelated to past federal government MED & AEC) activities at the site. Under FUSRAP, the Corps only has authority to clean up contamination related to past MED & AEC activities. Other contaminants that may exist/remain at the site after the FUSRAP clean up would be the responsibility of other state or federal environmental programs that exist for that purpose, such as Superfund.

5.4 DELPHI HARRISON TCE SITE

Delphi Harrison Thermal Systems owns and operates an automotive component manufacturing complex in Lockport, NY. The site is located at Building #8 in the north-central portion of the complex. This building formerly housed degreasing operations that utilized trichloroethylene (TCE). An above ground TCE storage tank was located at the southeast corner of this building from the early 1970's until May 1994, when it was decommissioned.

Prior to the installation of this "new" tank, an "old" tank was located 40 feet to the south. Four fire protection lines exist beneath the former "new" TCE storage tank, one of which ruptured in October 1994. During excavation to repair the rupture, site workers noted a solvent odor. As a result, soils from an approximate area of 27' by 22' were excavated to a depth of approx. 7.5' and disposed of as hazardous waste. The ROD also included a requirement for Delphi to conduct an evaluation as to whether potential indoor air impacts in Building 6, located adjacent to the groundwater plume, must be considered in the SMP. Delphi completed a vapor intrusion investigation in 2006. The results showed that vapor intrusion was not a concern and in August 2006 DEC issued a letter stating that no

further work regarding vapor intrusion within Building 6 is required. Delphi submitted draft versions of a Soils Management Plan and Operation and Maintenance Plan including long term groundwater monitoring to DEC for their review and comment in December 2006. (Knapp 2006)

To further evaluate the extent of TCE contamination, Delphi Thermal completed a soil gas survey, a utility bedding investigation, and installed twelve upper bedrock monitoring wells. These investigations indicate that site soils are not extensively contaminated, and that TCE migration along utility bedding is limited. Groundwater, however, is extensively contaminated with TCE and its breakdown products, with concentrations of TCE ranging up to 1000 ppm in the "new' tank area. A groundwater plume approximately 400 feet wide extends for at least 1300 feet from the former tank area. Site investigations conducted to date, however, do not suggest that contamination is migrating off site.

During 2001 the PRP installed additional monitoring wells to further define the nature and extent of the groundwater contamination plume. The Remedial Investigation and focused Feasibility Study Reports have since been completed by Delphi and reviewed by the DEC. The DEC issued a Record of Decision (ROD) for the site in March 2005 which called for a remedy consisting of Monitored Natural Attenuation (MNA) for groundwater contamination. The ROD includes a Site Management Plan (SMP) to protect current and future site users. Delphi is presently conducting an evaluation as to whether potential indoor air impacts must be considered in the SMP. An intensive groundwater monitoring program will be developed for the site as well.

5.5 FLINTKOTE PROPERTY (WILLIAM STREET ISLAND SITE)

A 6-acre site consisting of two properties: 198 Mill Street (the south portion) and 300 Mill Street (the north portion) formerly operated as a felt and composite laminate plant, which is now vacant and in disrepair. The site is bordered by Eighteenmile Creek and bisected by William Street, which is used by children attending a nearby elementary school. The machine shop portion of the plant was once a Class 3 site on the Registry of Inactive Hazardous Waste Disposal Sites (Site 932072), but a Phase I investigation determined drums of PCB-containing waste were stored properly and recommended no further action; the machine shop was delisted as Class D1. Drums were removed in 1984 and 1990. Investigation of the waste disposal area from 1996 to 1999 revealed extensive areas of ash fill on the plant property and along the creek banks. Sampling data shows characteristic hazardous waste due to TCLP failure for lead. (TCLP is Toxicity Characteristic Leaching Procedure - a leaching test used to identify hazardous waste).

Niagara County took title to the property in 1999 via tax foreclosure. During 2003 the county conducted a Site Investigation under the Department's Environmental Restoration Program. The SI report was submitted to the DEC in 2004. A draft Remedial Alternatives Report (RAR) was submitted to NYSDEC in May 2005. NYSDEC

decided to continue collecting additional creek sampling data as needed for the site in 2005 and 2006. The DEC anticipates that the site may be split into 2 operable units- the plant, and the creek. The County will likely not opt to continue past the SI/RAR phase, and the site may need a referral to the State Superfund in order to complete a Remedial Design and implement a remedy. A Supplemental RI/FS is scheduled to commence for the site in 2007.

TABLE 5-1 INACTIVE HAZARDOUS WASTE SITE PROGRESS CHART

SITE NAME	PHASE I	PHASE II	RI/FS	REMEDIAL DESIGN	REMEDIAL COST	REMEDIATION COMPLETE OR NOT REQUIRED
Lockport City Landfill						
Diversified Manufacturing						
Dussalt Foundry						
Harrison Radiator/Landfill						
Niagara County Refuse Dist.						
Norton Labs						
AKZO Chemical, Inc.						
Guterl Steel/Landfill Site						
Guterl Steel/ Plant Site						
Van DeMark						
Wilson-Cambria Landfill						
Diamond Shamrock						
Flintkote/ Plant Building						
Niagara Materials						
Town of Lockport Landfill						
NYSEG Substation						
Delphi Harrison Systems						
Flintkote/William St. Island						

TABLE 5-2 CLASSIFICATIONS FOR HAZARDOUS WASTE SITES

Class 1 Site	Causing, or presenting an imminent danger of causing, irreversible or irreparable damage to the public health or the environment - immediate action is required.
Class 2 Site	Significant threat to the public health or environment - action required
Class 3 Site	Does not present a significant threat to the environment or public health - action may be deferred
Class 4 Site	Site properly closed - requires continued management
Class 5 Site	Site properly closed - does not require continued management
Class 2a Site	Temporary classification assigned to sites where there is confirmed disposal of hazardous waste but there is inadequate data on hazardous waste impact to the environment and human health to assign them to the five classifications specified by law

6.0 RAP PLANNING/ EDUCATION & OUTREACH

The following section summarizes past accomplishments related to general Remedial Action Plan planning, education and outreach and general AOC and watershed initiatives on a grandiose scale.

6.1 EIGHTEENMILE CREEK CWMP CONCEPT DOCUMENT

In 2004, a Comprehensive Watershed Management Plan Concept Document was published for the Eighteenmile Creek watershed. The purpose of this report is to provide a document specific to Eighteenmile Creek that will lay the foundation for initiating the watershed planning process, and will provide a framework for developing a CWMP for the Eighteenmile Creek Watershed. This Concept Document also presents: existing watershed information for Eighteenmile Creek, which will support the early stages of the planning process; guidelines, based upon literature sources, for the development of the other components of a CWMP, which will serve as a framework for a future Eighteenmile Creek CWMP. This document has been prepared to: Provide readily available information that specifically applies to the Eighteenmile Creek watershed; Provide an overall framework for a CWMP that can be followed once the planning process begins; and offer example text to demonstrate the content of specific sections of the Eighteenmile Creek CWMP, once a plan is developed (i.e., Watershed Management Actions).

6.2 STATE OF THE BASIN REPORT

A State of the Basin Report was published for the Eighteenmile Creek watershed. The State of the Basin Report provides a snapshot of the current condition of land and water resources in the Eighteenmile Creek basin and a look at the programs and initiatives pursued to preserve and restore those resources. It also provides a vehicle for establishing a consistent process of identifying resource needs, priorities, and potential work plans. The report is a catalyst for increased interagency cooperation and public involvement, through identification and prioritization of issues and objectives. The idea of creating a "basin wide" report stems from the decision to take an ecosystem based approach to address the AOC. This approach will hopefully enable increased coordination among programs and individuals.

6.3 AOC REPORT CARD

In 2005, the Eighteenmile Creek AOC Report Card was created by the Remedial Advisory Committee to give a brief overview of the health and current conditions of Eighteenmile Creek. The Report Card lists six indicators related to the creek: Water Quality; Contamination; Fish & Wildlife; Public Access and Recreation; Environmental Education

and Public Involvement and; Remedial Action Plan. Each indicator has been divided into several "sub-categories." Each sub-category has been assigned a letter grade based upon past successes, current health and conditions, and trends over the past 10 years. The Report Card also identifies action steps and immediate concerns to be addressed in order to meet restoration targets for the Area of Concern. The Report Card will be updated on an annual basis and is available for public viewing at www.eighteenmilerap.com

6.4 EIGHTEENMILE CREEK POLLUTANT GENERATOR DATABASE

In 2006 a historic/current pollutant generator/discharge database was developed for the Eighteenmile Creek watershed. The goal of the project was to create a single interactive database that acts as a source to review and analyze all pollutant generators/dischargers, and water quality and sediment sampling data that have been conducted within the Eighteenmile Creek watershed over the years. The database identifies current and past discharges, spills, or releases of hazardous materials as well as historic analytical results from samples collected within the Barge Canal and within the watershed by USACE Buffalo District, New York Department of Environmental Conservation, New York State Energy Research and Development Authority, and Ecology & Environment, Inc. (on behalf of NCSWCD for the Eighteenmile Creek RAP). The database also incorporated information from the NYSDEC for current permitted discharges. The database includes (but is not limited to):

- Identification of firms, individuals, or entities;
- Locations and dates of discharges/releases/spills;
- Identification of materials discharged, released or used on-site;
- Locations and dates of collected water and sediment samples;
- Sample collection methods;
- Sample results by depth (of sediment);
- Tax parcel and 2002 land use/land cover mapping;
- Brownfields;
- Wetlands and floodplains; and
- Complete aerial coverage.

The database was developed into an ARC IMS site that will be utilized by the Eighteenmile Creek RAP as an analytical tool and decision support model. Specifically the database can be used for: determining contaminant sources; analyzing contaminant source, sink, and transport dynamics; evaluating geo-spatial relationships; prioritizing future field investigations and remedial activities, and becoming a decision support model. The current/historic pollutant generator/discharge database will be a "living" database as new data will be incorporated into the system over time. This will prove to be an effective tool for identifying problem areas, prioritizing projects, and tracking

down contaminant sources. The greater goal is use the information to support the de-listing of Beneficial Use Impairments and ultimately the de-listing of Eighteenmile Creek as a Great Lakes Area of Concern. (E&E, 2006)

6.5 NEWFANE ENVIRONMENTAL FAIR

The Newfane Intermediate School and Town of Newfane hold their annual Environmental Fair at Fisherman's Park in Burt, New York. Since 2004, approximately 100 students, teachers and parents from the Newfane Intermediate School participate in this annual event. Students are broken down into small groups and rotated through a series of learning stations located around Fisherman's Park and along Eighteenmile Creek. Each learning station provides the students with information on such topics as conservation facts, wildlife rehabilitation, water quality protection, tree and shrub planting and restoration of Eighteenmile Creek. In 2006, a number of new learning stations were added to the event which included, AOC History, Aquatics, pole casting and archaeology of Niagara County.

FIGURE 6-1 ENVIRONMENTAL FAIR POLE CASTING DEMONSTRATION

FIGURE 6-2 ENVIRONMENTAL FAIR AQUATICS PRESENTATION

* Presentation courtesy of U.S. Fish and Wildlife Service, Amherst, NY Office

6.6 EIGHTEENMILE CREEK EDUCATION SERIES

In January 2005, fifty-five students from various Universities throughout Canada participated in a stream and habitat restoration class that visited Eighteenmile Creek's Area of Concern. The class was led by Dave Derrick of the U.S. Army Corps of Engineer's Research and Development Center (USACE ERDC) and Paul Fuhrman of Ecology and Environment (E&E).

While visiting the creek, the students were able to gain first hand knowledge of the activities that were completed under the Eighteenmile Creek Streambank Stabilization and Habitat Restoration Project. Dave Derrick informed the students that the project activities included removing debris from the area, improving the existing hiking trail, stabilizing eroded stream banks, improving habitat for fish, reducing pollution and planting vegetation in needed areas. Paul Fuhrman explained why adequate habitat is so important to fish species present in this portion of the creek. He also described how the project attempted to mimic existing habitat conditions already present in the project area. Both gentlemen also touched upon specific habitat restoration efforts that were completed as part of the project. Although not visible, fish lunkers were pointed out as an important aspect of the restoration process.

FIGURE 6-3 DAVE DERRICK (USACE ERDC) DISCUSSES HYDRAULIC COVERSTONES

FIGURE 6-4 PAUL FUHRMAN (E&E) EMPHASIZES IMPORTANCE OF HABITAT

In December 2005, the Area of Concern was the location of an outdoor classroom for a group of students from Buffalo State College (BSC). USACE staff, NYS DEC staff, BSC professors and the principal investigator were on hand, along with a group of 30 students enrolled in a watershed analysis class. A tour of the AOC and corresponding lectures by those present educated the group about the history of the Area of Concern and the accomplishments that have been achieved thus far, specifically the 2004 habitat restoration project.

In August 2006, the AOC was the location of an Army Corps of Engineers led a tour for individuals attending the 2005 Soil & Water Conference held in Rochester, NY. The tour educated the group of 20 about the history of the AOC and the accomplishments that have been achieved thus far, specifically the 2004 habitat restoration project and various contaminant track down projects underway throughout the watershed.

6.7 DELISTING CRITERIA/RESTORATION TARGETS

The Eighteenmile Creek RAC and NCSWCD have defined draft delisting criteria and restoration targets for the 3 confirmed Beneficial Use Impairments (BUIs). The criteria was developed utilizing all of the existing data that supports the current impairments, as well as more current environmental data relevant to Eighteenmile Creek (AOC sediment investigations). Table 6-1 summarizes the draft delisting criteria/restoration targets for the 3 confirmed BUIs.

TABLE 6-1 DRAFT DELISTING CRITERIA/RESTORATION TARGETS

RESTRICTIONS ON FISH & WILDLIFE CONSUMPTION

IJC Criteria: An impairment will be listed when contaminant levels in fish or wildlife populations exceed current standards, objectives or guidelines, or public health advisories are in effect for human consumption or fish or wildlife. Contaminant levels in fish and wildlife must be due to contaminant input from the watershed.

DELISTING GUIDELINE

When contaminant levels in AOC fish and wildlife populations do not exceed current standards, objectives or guidelines, and no public health advisories are in effect for human consumption of fish or wildlife. Contaminant levels in fish and wildlife must not be due to contaminant input from the watershed.

SITE SPECIFIC PROBLEM - Consumption advisory in AOC is that of Lake Ontario, not the upstream portion of the creek.

****Supplemental Guidelines**

There is no Area of Concern-specific fish and wildlife consumption advisories issued by New York State;
There is no significant contaminant input from the Eighteenmile Creek watershed contributing to contaminant levels in fish and wildlife tissue that require fish and wildlife consumption advisories, as indicated by the following:
Tissue concentrations of contaminants of concern in representative samples of resident fish and wildlife are lower than the guidelines requiring advisories.

DEGREDATION OF BENTHOS

IJC Criteria: An impairment will be listed when benthic macroinvertebrate community structure significantly diverges from unimpacted control sites of comparable physical and chemical characteristics. In addition, this use will be considered impaired when toxicity (as defined by relevant, field-validated, bioassays with appropriate quality assurance/quality controls) of sediment-associated contaminants at a site is significantly higher than controls.

DELISTING GUIDELINE

When the benthic macroinvertebrate community structure does not significantly deviate from unimpacted control sites of comparable physical and chemical characteristics. Also, in the absence of benthic community data, this use will be considered restored when the level of toxic contaminants in sediments is not significantly higher than controls.

RESTRICTIONS ON DREDGING

IJC Criteria: An impairment will be listed when contaminants in sediments exceed standards, criteria, or guidelines such that there are restrictions on dredging or disposal activities.

DELISTING GUIDELINE

When contaminants in AOC sediments do not exceed standards, criteria, or guidelines such that there are restrictions on dredging or disposal activities.

7.0 NEXT STEPS

The following section summarizes the next steps and future commitments to the Eighteenmile Creek AOC Remedial Action Plan.

RE-EVALUATE THE STATUS OF BUI # 1 (FISH & WILDLIFE CONSUMPTION)

In an effort to re-evaluate BUI #1, an investigation that will definitively assess the impairment status of fish and wildlife consumption in the AOC will be completed. At a minimum the project will require the assessment of PCB and Dioxins/Furan levels in fish flesh. A fish consumption advisory was issued for Eighteenmile Creek and its AOC in 1994, in response to elevated PCB levels found during a 1992 fish collection. No data regarding the levels of contaminants in Eighteenmile Creek fish populations exists beyond this 14 year old study. Prior to sampling, a sampling plan will be completed. The New York State Department of Health (NYSDOH) and NYSDEC will both be consulted during this process to assure that the data collected will be usable by both parties during the re-evaluation of existing fish and wildlife consumption advisories. Funding for this initiative is anticipated under the 2007-2011 RAP Coordination grant awarded by USEPA. NCSWCD will be responsible for the overall completion of the project which is scheduled to commence in 2007.

EVALUATE THE STATUS OF BUI # 3 (DEGRADATION OF FISH & WILDLIFE POPULATIONS) AND BUI # 5 (BIRD/ANIMAL DEFORMITIES OR REPRODUCTIVE PROBLEMS)

To address BUI #3 and to an extent BUI #5, an investigation that will definitively assess the impairment status of fish and wildlife populations and bird/animal deformities or reproductive problems within the AOC will be completed. At a minimum the project will require a comparison of conditions from a control site. At the suggestion of NYSDEC, Division of Fish Wildlife and Marine Resources, Oak Orchard Creek should be used as a control site because it has many similar characteristics to that of Eighteenmile Creek. For instance, both receive a discharge from the NY Barge Canal, both have a dam, both creeks have a similar estuary area at the mouth and drainage basins are also similar in size. Funding for this initiative is anticipated under the 2007-2011 RAP Coordination grant awarded by USEPA. NCSWCD will be responsible for the overall completion of the project which is scheduled to commence in 2007.

EVALUATE THE STATUS OF BUI # 4 (PREVALANCE OF FISH TUMORS)

To address BUI #4, an investigation that will definitively assess the impairment status of fish tumors in AOC fish populations will be completed. At a minimum the project will require a comparison of conditions from a control site (Oak Orchard Creek) and analysis by a qualified fish pathologist. Funding for this initiative is anticipated under the 2007-2011 RAP Coordination grant awarded by USEPA. NCSWCD will be responsible for the overall completion of the project which is scheduled to commence in 2007.

ESTABLSH DELISTING CRITERIA AND RESTORATION TARGETS

With assistance from the USEPA contractor, existing draft delisting criteria should be finalized by the RAC. Also, upon completion of the various BUI assessments scheduled for 2007-2008, delisting criteria and restoration targets should be developed by the RAC for the following, if an impairment does exist:

- #3 Degradation of fish and wildlife populations
- #4 Prevalence of tumors in AOC fish populations
- #5 Bird/Animal deformities or reproductive problems

CONTAMINANT LOAD MONITORING PROJECT

The USEPA has funded NYSDEC to conduct various sampling and analytical events in Eighteenmile Creek for the purpose of estimating loads of PCBs, dioxins, pesticides, and mercury to Lake Ontario. To increase the chances of sampling events, the project will be conducted over two calendar years beginning in the fall of 2006. Sampling will be performed using a Trace Organics Platform Sampler (TOPS).

WATER QUALITY MONITORING PROJECT

NCSWCD will continue a second year of monitoring the major creeks within the county, including Eighteenmile Creek, for baseline and storm event sediment and nutrient loads as well as BOD and temperature. Baseline monitoring will be completed on a monthly basis in addition to sampling of four storm events. The results will be used to identify those creeks in need of further study, to provide scientific data to update the Priority Waterbodies List and to identify problems and prioritize local projects. The monitoring of water quality in the creek will be performed via grab samples. Sampling parameters will include total phosphorus, total suspended solids, sodium, nitrate, nitrite, and total kjeldahl nitrogen. The sampling and analysis will be aimed at collecting baseline data related to nutrient loading of the various creeks.

CITY OF LOCKPORT CSO INVESTIGATION

The City of Lockport is gearing up to investigate their 12 remaining Combined Sewer Overflow's (CSOs) that discharge to the New York State Barge Canal and Eighteenmile Creek. The City of Lockport believes that most flow is going to the waste water treatment plant, and not into the canal or the creek. New York State Department of Environmental Conservation (NYSDEC) has issued a standing order to correct all CSO systems that negatively affect a waterbody. Monitors will be installed in the system and if it can be shown that 85% of the flow during a rain event reaches the treatment plant, NYSDEC will grant an exemption to the standing order.

SUPPLEMENTAL RI/FS - EIGHTEENMILE CREEK CORRIDOR SITE

NYSDEC will be conducting a Supplemental Remedial Investigation/Feasibility Study (RI/FS) that will further define the nature and extent of sediment contamination in Eighteenmile Creek and evaluate, to the extent possible, the source areas adjacent to the creek (White Transportation Property, the former United Paperboard Company property, and Upson Park). As part of the Supplemental RI/FS, Phase I Environmental Site Assessments will be completed at the adjacent source areas to help locate potential sampling locations and possibly identify the source(s) of the fill materials found there. Field investigations will then be completed at these properties to further characterize the nature and extent of contamination found on them during the Eighteenmile Creek Corridor Site RI. In addition, transects perpendicular to the creek will be probed to determine sediment thickness. Sediment samples will also be collected during this study from areas not previously sampled (center of the creek). Also, a FS will be completed that evaluates remedial alternatives for the Eighteenmile Creek Corridor Site. (2006, NYSDEC; DER)

WATERSHED SCALE SEDIMENT INVESTIGATION

Existing data on Eighteenmile Creek sediments indicate that most of the sources of contamination are located upstream of the AOC boundary, between Burt Dam and the New York Barge Canal. Sediment quality data on this reach of the creek is very limited. The major sources of sediment contamination are believed to be the New York Barge Canal, Flintkote Plant Site and City of Lockport Sewage Collection System. (USEPA, 2002) The Burt and Newfane Dams serve to accumulate contaminated sediments in the creek. Since NYSDEC and NYSDOH are actively investigating the segment of creek near the Flintkote Plant Site (Eighteenmile Creek Corridor Site), a scope of work has been completed which outlines a preliminary plan and cost estimate to sample and analyze sediments relative to all other suspected sources in the upstream reach. (USACE. 2006) NCSWCD, with assistance from various stakeholders, will attempt to secure funding to complete this investigation.

COMPREHENSIVE WATERSHED MANAGEMENT PLAN

The Eighteenmile Creek Concept Document was developed under the budget available for the Eighteenmile Creek Restoration Project, on behalf of the Niagara County Department of Economic Development. The document was prepared to initiate the process of creating a Comprehensive Watershed Management Plan (CWMP) specific to the Eighteenmile Creek Watershed. The effort of initiating the planning process is also being supported by the U.S. Army Corp of Engineers - Buffalo District (USACE) and the Niagara County Soil & Water Conservation District (NCSWCD.)

NYSDEC ROTATING INTENSIVE BASIN STUDY (RIBS)

NYSDEC Division of Water monitors the overall health of New York's waterways under the Rotating Intensive Basin Study (RIBS) program. Over a three year cycle, this program includes analyses of water and sediment samples for chemical contaminants as well as toxicity tests and macroinvertebrate sampling for both chemical contamination and species diversity. Eighteenmile Creek will be included as a RIBS site every five to six years and is currently being investigated in the 2005-2007 cycle.

MUNICIPAL AND INDUSTRIAL WASTEWATER DISCHARGE PERMITTING

NYSDEC is responsible for reviewing self monitoring reports from dischargers, inspects operating facilities and independently samples effluent to check on the validity of self monitoring data. NYSDEC shall continue discharge permit monitoring and renewal activities to achieve compliance with secondary treatment for municipal discharges and best available technology and best management practices for industrial discharges. Significant violations of permit conditions trigger compliance or enforcement measures. As new standards or technologies are developed, each permit will be reassessed to assure that updated water quality standards and technology requirements are applied.

APPENDIX A
STATUS OF BENEFICIAL USE IMPAIRMENTS

USE IMPAIRMENT	STATUS	CAUSES	NEXT STEP
1. Restriction on fish and wildlife consumption	**Impaired**	**PCB's and Dioxins in sediment and fish flesh**	**Remediate all sources and sinks of contaminants throughout watershed**
2. Tainting of fish and wildlife flavor	Not Impaired	Non Applicable	Non Applicable
3. Degradation of fish and wildlife populations	**Unknown**	**Unknown**	**Fish and wildlife population assessment scheduled for 2007**
4. Fish tumors and other deformities	**Unknown**	**Unknown**	**Fish pathology assessment scheduled for 2007**
5. Bird or animal deformities/reproductive problems	**Likely**	**PCB's, DDT and metabolites, Dioxins and Dieldrin**	**Ascertain status during 2007 population assessment**
6. Degradation of benthos	**Impaired**	**PCB's and various metals in sediment**	**Remediate all sources and sinks of contaminants throughout watershed**
7. Restrictions on dredging	**Impaired**	**PCB's, Chromium, Copper, Cyanides, Lead, Manganese, Mercury, Nickel, Zinc, and Dioxins in sediment**	**Remediate all sources and sinks of contaminants throughout watershed**
8. Eutrophication or undesirable algae	Not Impaired	Non Applicable	Non Applicable
9. Restriction on drinking water consumption or taste and odor problems	Not Impaired	Non Applicable	Non Applicable
10. Beach closings	Not Impaired	Non Applicable	Non Applicable
11. Degradation of aesthetics	Not Impaired	Non Applicable	Non Applicable
12. Added cost to agriculture and industry	Not Impaired	Non Applicable	Non Applicable
13. Degradation of phytoplankton and zooplankton populations	Not Impaired	Non Applicable	Non Applicable
14. Loss of fish and wildlife habitat	Not Impaired	Non Applicable	Non Applicable

APPENDIX B

STATUS OF INACTIVE HAZARDOUS WASTE SITES

Site #	Site Name	Site Code	Time in Service	Site Size	Status	Site Contents	Contaminant Migration Potential
932010	Lockport City Landfill	4	1950-1976	30 Acres	Remedial Construction complete. Long term operation and maintenance underway.	Metal sludge, industrial waste, and PCB's	Adjacent to Gulf Creek. Contaminants found in ground water and creek sediments.
932011	Diversified Manufacturing	D	Unknown	Not Known	DELISTED. No significant contamination found on site.	Waste oil and solvents	1.5 miles from Eighteenmile Creek. No hazardous waste found on site.
932012	Dussalt Foundry	D	Pre-1987	5+ Acres	DELISTED. No hazardous waste found on site.	Foundry sand, drums of unknown materials.	1.5 miles from Eighteenmile Creek. No hazardous waste found on site.
932017	Harrison Radiator/ Landfill	D	1978-1985	10+ Acres	DELISTED. Remedial action complete; no hazardous waste remains on site.	Metal hydroxides, calcium fluoride	Adjacent to The Gulf.
932024	Niagara County Refuse Disposal District	4	Unknown	35+ Acres	Landfill closed in 1994. Long term operation , maintenance and monitoring underway.	Heavy metal sludge, WWTP sludge	500 feet to the Gulf Creek.
932029	Norton Labs	D	Prior to 1976	Not Known	DELISTED. No consequential amounts of hazardous waste found on site.	Waste lubricating oil, polyester based plastics	1 mile from Eighteenmile Creek.
932030B	AKZO Chemical	3	Prior to 1978	1 Acre	Remedial investigation completed. CMS completed, long term operation and maintenance underway.	Benzoyl peroxide sludge and other organic residues	1500 feet from Eighteenmile Creek .

Site #	Site Name	Site Code	Time in Service	Site Size	Status	Site Contents	Contaminant Migration Potential
932032	Guterl Steel Landfill	2	Unknown	8.6 Acres	Phase II site assessment complete. RI/FS has commenced	Slag, bag house dust, foundry sand, waste oil and grease	1.5 miles from creek. Heavy metal contamination found in landfill groundwater
N/A	Guterl Steel Plant Site	N/A	Unknown	70 Acres	Sampling investigation conducted by NYSDEC. Site referred to USACE under FUSRAP Program	Heavy metals, radioactivity and PCBs in soil.	Site adjacent to NY Barge Canal.
932039	Van De Mark	4	1968-1982	5+ Acres	Landfill closed and groundwater monitoring underway.	Silicon tetrachloride, Chlorosisiloxane	Adjacent to Eighteenmile Creek
932069	Wilson-Cambria-Newfane Sanitary Landfill	4	1960-1984	50 Acres	Closure completed and groundwater monitoring is ongoing.	Peroxides, keetox, and Oxylite	4 Miles from Eighteenmile Creek
932071	Diamond Shamrock	D	1923-present	5 Acres	DELISTED. No consequential amounts of hazardous waste were found on site.	Bottom sludge from sodium silicate tanks.	Boiler ciders and fly ash, 1.5 miles from Eighteenmile Creek
932072	Flintkote/Plant Building Site	D	Unknown	1 Acre	DELISTED. No evidence of release to the environment found	7 drums of waste transformer oil with PCBs	Adjacent to Eighteenmile Creek
932073	Niagara Materials	D	2 years during 1950s	1 Acre	DELISTED. A Phase 2 investigation did not reveal significant contamination of soil, surface or ground water.	Hexachloro-di-siloxane PAHs, phenolics, halogenated organics, etc.	2000 feet from Gulf Creek , a tributary to Eighteenmile Creek

Site #	Site Name	Site Code	Time in Service	Site Size	Status	Site Contents	Contaminant Migration Potential
932077	Town of Lockport Landfill	D	1948-1961	18.5 Acres	DELISTED. No hazardous waste found on site.	N/A	3.6 miles from Eighteenmile Creek
932089	NYSEG Substation	D	Unknown	< 1 Acre	DELISTED. The materials disposed of do not meet the criteria for hazardous waste.	Manufactured gas processing waste, PAHs and cyanides	3000 feet from Eighteenmile Creek, adjacent to Barge Canal
932113	Delphi Harrison/ TCE Site	3	1970-1980s	2 Acres	Record of Decision issued by NYSDEC. Monitored Natural Attenuation of groundwater planned to be ongoing.	TCS from leaking tank. Ground water plume remains on site	300 feet from plume to Gulf Creek. Groundwater migration to The Gulf.
Pending	Flintkote Property (William Street Island Site)	Pending	Unknown	6 Acres	Site Sampling investigations conducted by NYSDEC in 1n 1996, 1999, 2004, and 2006. A supplemental RI/FS will commence in 2007.	Ash fill, PAHs. PCBs, and various metals.	Groundwater leachate from ash fill discharges to Eighteenmile Creek.

REFERENCES

Coleates, Richard. 2006. *Field Data Report; Lake Ontario Tributaries; 2002-2004*. New York: U.S. Environmental Protection Agency, Region 2, Monitoring Operations Section

Clough Harbour & Associates LLP. 2006. *CSO Characterization and Monitoring Report, Lockport, NY*. Prepared for the City of Lockport by Clough Harbor & Associates LLP. Buffalo, NY.

Ecology and Environment, Inc. 2003. *Eighteenmile Creek Restoration Project: Baseline Habitat Characterization And Threatened And Endangered Species Coordination*. Lancaster: Ecology and Environment, Inc.

Ecology & Environment, Inc. 2006. Description of Pollutant Generator Database furnished by Kris Ericson of Ecology & Environment, Inc., Lancaster, N.Y.

Inamdar, S. 2005. *Sediment Modeling For The Eighteenmile Creek Watershed, Niagara County*. Prepared for USACE, Buffalo District, NY. Buffalo: Great Lakes Center and Department of Geography, SUNY Buffalo State College.

Knapp, Roy. 2006. Personal communication on 2/23/2007 with Roy Knapp, Facilities and Environmental Manager for Delphi Corporation.

Makarewicz, J.C., Lewis, T.W., Seider, M.J., White, D., DiGiacomo, V.F.JR.. 2006. *Nutrient and Soil Loss From The Eighteenmile Creek Watershed*. Brockport: The Department of Environmental Science and Biology; State University of New York at Brockport

Makarewicz, J.C., Lewis, T.W. 2002. *Eighteenmile Creek Remedial Action Plan Area Of Concern Planktonic Community Study*. Brockport: The Department of Environmental Science and Biology; State University of New York at Brockport

May, Glenn. 2003. *Sampling Report: Water Street Properties, City of Lockport, Niagara County, New York*. Buffalo: NYSDEC, Region 9, Division of Environmental Remediation

May, Glenn. 2006. *Remedial Investigation Report, Eighteenmile Creek Corridor, Lockport, Niagara County, New York*. Buffalo: NYSDEC, Region 9, Division of Environmental Remediation

New York State Department of Agriculture and Markets. 2006. website link; http://www.agmkt.state.ny.us/SoilWater/aem/index.html

NYSDEC. 2003. *2003 Annual Report: Bureau of Fisheries Lake Ontario Unit & St. Lawrence River Unit to the Great Lakes Fishery Commission's Lake Ontario Committee.* Albany: NYSDEC

NYSDEC. 2004. *2003 Annual Report: Bureau of Fisheries Lake Ontario Unit & St. Lawrence River Unit to the Great Lakes Fishery Commission's Lake Ontario Committee.* Albany: NYSDEC

NYSDEC. 2005. *2003 Annual Report: Bureau of Fisheries Lake Ontario Unit & St. Lawrence River Unit to the Great Lakes Fishery Commission's Lake Ontario Committee.* Albany: NYSDEC

NYSDEC. 2005. *The Lake Ontario Drainage Basin; Sampling Years 1999-2003; Rotating Integrated Basin Studies Data Report.* Albany: NYSDEC, Division of Water

NYSDEC. 2006. *Memorandum, Conceptual Approval Memo of Proposed Engineering Standby Contract Work Assignment.* Buffalo: NYSDEC, Division of Environmental Remediation

Pickard, S.W. 2006. *Eighteenmile Creek Great Lakes Area of Concern (AOC) Niagara County, New York; Concentrations, Bioaccumulation and Bioavailability of Contaminants in Surface Sediments.* Buffalo: USACE, Buffalo District

Prindle, S.E., Bishop, D.L., Penney, M.E.. 2005. *Fall 2005 Lake Ontario Tributary Angler Survey.* Cortland: NYSDEC

URS Corporation. 2006. *Summary Report For PCB's Detected In New York State Barge Canal Sediments During Investigation Of NYSEG's Transit Street and State Road Former MGP Sites; Sites # 9-32-098 and # 9-32-109.* Buffalo: URS Corporation

USACE. 2006. *Scope of Work, Eighteenmile Creek Sediment Investigation, Upstream of Area of Concern (AOC).* Buffalo: USACE, Buffalo District

USEPA. 2002. *Lake Ontario Lakewide Management Plan. Biennial Report.*

Wilkinson, M.A., Sanderson, M.J., Bishop, D.L. 2005. 2005 *New York Cooperative Trout and Salmon Pen-Rearing Projects.* Buffalo: NYSDEC, Region 9, Division of Fish Wildlife and Marine Resources