

**MILL CREEK GEOGRAPHIC INITIATIVE
PHASE II**

MILL CREEK WATERSHED
LOGAN, UNION, DELAWARE COUNTIES
and
MARYSVILLE, OHIO AREA

US EPA ID: OHGI000000003

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MILL CREEK GEOGRAPHIC INITIATIVE PHASE II

SITE: Mill Creek

US EPA ID: OHGI000000003

Location: Northwest-Central Ohio (Marysville, OH)

Counties: Logan, Union, and Delaware

Dates of sampling/investigation: Phase II- June 10, 1998; Phase I- August 26-27, 1997

USGS Topographic Maps: Peoria, West Mansfield, East Liberty, Marysville, Magnetic Springs, Shawnee Hills, Ostrander

1.0 INTRODUCTION

This investigation was completed in conjunction with the first Mill Creek Geographic Initiative Report, completed September 1998. On June 10, 1998, the Ohio EPA, Division of Emergency and Remedial Response (DERR) collected additional samples in Marysville, Ohio to possibly identify additional source areas along Town Run and Mill Creek. All samples were collected in accordance with the Phase II Mill Creek Geographic Initiative Work Plan, approved by US EPA on June 4, 1998. This report summarizes the results of the Phase II investigation and provides discussions regarding potential source areas. For discussions of the physical geography and previous sampling results, the September 1998 Mill Creek Geographic Initiative (GI) report should be referenced (Ohio EPA, 1998). In summary, the September 1998 GI report concluded that primary contamination sources within the Mill Creek watershed include: the former Eljer Plumbingware facility, the Marysville wastewater treatment plant (WWTP), Ray Lewis and Sons, the Scotts Company, and various non-point urban and rural sources.

The Phase II investigation focused on Town Run and Mill Creek in Marysville. Elevated levels of various contaminants in Town Run prompted additional sampling of sediments to better define a profile of contamination throughout Town Run and to possibly determine point source inputs of contamination. In addition, soil sampling was conducted at a former lumber yard, near a bulk oil distribution center, and at a former seed facility. Two additional sediment samples were collected in Mill Creek and were located down gradient of Town Run to identify potential sources and determine the impacts of Town Run on Mill Creek.

2.0 PHASE II SAMPLE LOCATIONS

Phase II sampling locations are presented in Figure 1. Elevated levels of polynuclear aromatic hydrocarbons (PAHs) and frequent detections of various pesticide compounds prompted additional investigation along Town Run. Samples were collected to reconfirm past samples, to fill in data gaps through additional coverage of Town Run, and to directly sample near potential

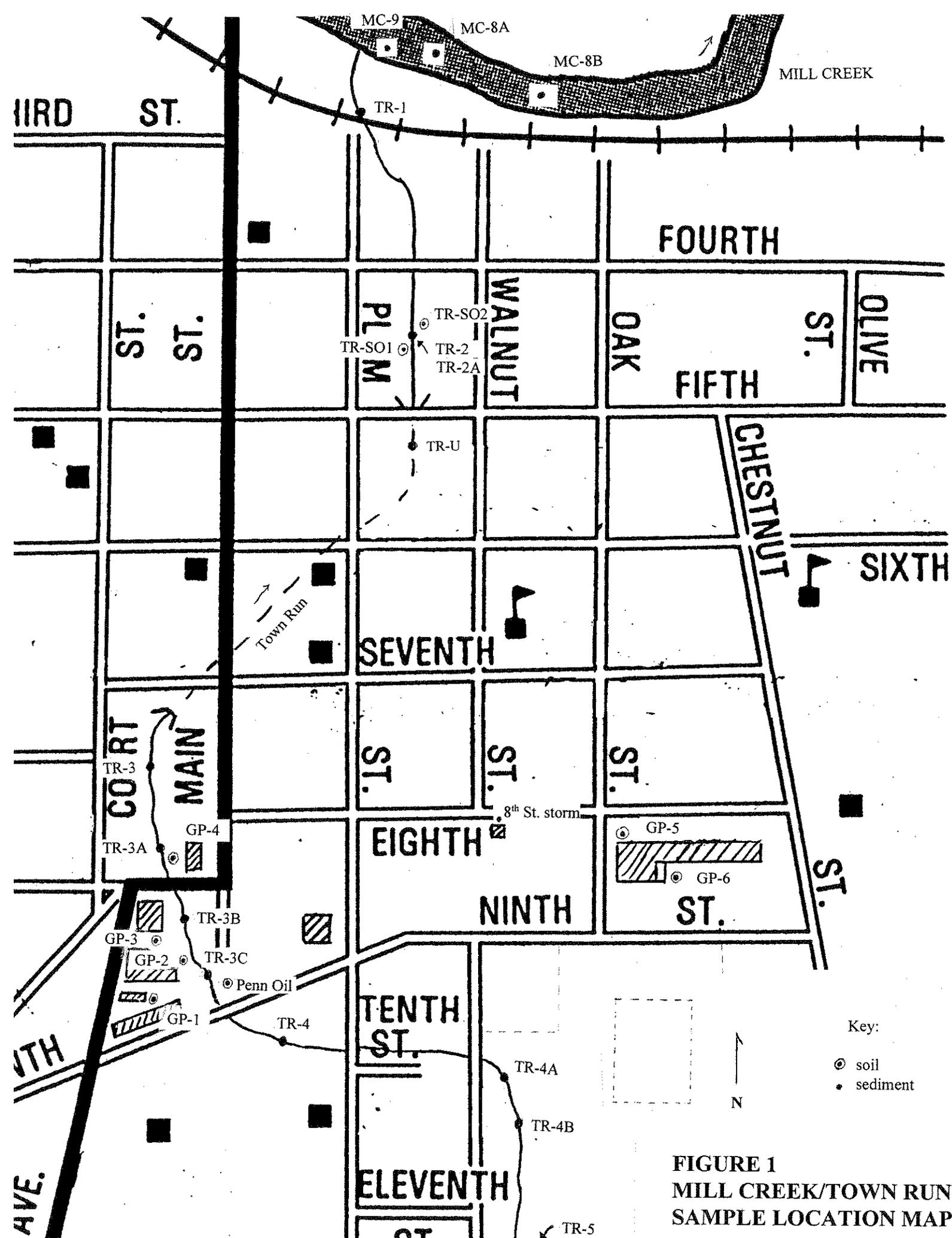


FIGURE 1
MILL CREEK/TOWN RUN
SAMPLE LOCATION MAP

sources. Two sample locations were also selected in Mill Creek, down gradient of Town Run, to provide a more representative sediment sample than MC-9 of the September 1998 GI report and to further define possible down stream migration of contaminants from Town Run to Mill Creek. Table 1 and 2 provide a summary of the sample locations for the Phase II investigation.

TABLE 1 PHASE II TOWN RUN SAMPLE LOCATIONS

Location	River Mile	Matrix	Analytes	Description
TR-2A	RM 0.1	sediment	metals, cyanide, SVOCs, pesticides/PCB	Sediment sample at previous TR-2 to verify elevated DDT concentration. Between Fourth and Fifth Streets, just north of culvert exit. CLP ID= EAJJ6/MEBJT6
TR-SO1	RM 0.1	soil 0-6"	metals, cyanide, pesticides/PCB, SVOC	Soil sample on west bank of Town Run near sediment sample TR-2A. CLP ID= ECGK7/MEBKA7 Duplicate sample: TR-SO20: ECGK8/MEBKA8
TR-SO2	RM 0.1	soil 0-6"	metals, cyanide, pesticides/PCB, SVOC	Soil sample on east bank Town Run near TR-2A. CLP ID= ECGK9/MEBKA9
TR-3A	RM 0.4+	sediment	metals, cyanide, pesticides/PCB, SVOC	Upstream sediment sample from previous TR-3. Located west of former lumber co. offices and possible exterminator. North of Eighth St., east of Main St. CLP ID= EAJK3/MEAGJ3
TR-3B	RM 0.5	sediment	metals, cyanide, pesticides/PCB, SVOC	Located east of former lumber yard and downstream of storm sewer outfalls. South of Eighth St., east of Main St. CLP ID= EAJK4/MEAGJ4
TR-3C	RM 0.5+	sediment	metals, cyanide, pesticides/PCB, SVOC	Located east of southern edge of former lumber yard. Also, oil distributor located 100+ yards to the east. North of Ninth St. CLP ID= EAJK5/MEAGJ5
GP-1	RM 0.5	soil direct push 4.5-6.0'	metals, cyanide, pesticides/PCB, SVOC	South side of former lumber company. Near wood storage area. CLP ID= ECGK/MEBKA0
GP-2A	RM 0.5	soil direct push 4.5-5.5'	metals, cyanide, pesticides/PCB, SVOC	East side of former lumber, along low drainage point of parking lot. CLP ID= ECGK1/MEBKA1
GP-2B	RM 0.5	soil direct push 8.0-9.0'	metals, cyanide, pesticides/PCB, SVOC	Same as GP-2A, deeper sample. CLP ID= ECGK2/MEBKA2

Location	River Mile	Matrix	Analytes	Description
GP-3	RM 0.5	soil direct push 5.0-6.0'	metals, cyanide, pesticides/PCB, SVOC	North end of former lumber company area. South of Eighth St. CLP ID= ECGK3/MEBKA3
GP-4	RM 0.4+	soil direct push 6.5-8.0'	metals, cyanide, pesticides/PCB, SVOC	On east bank of Town Run at location TR-3A. North of Eighth St. near former lumber company offices. CLP ID= ECGK4/MEBKA4
TR-4A	~RM 0.8	sediment	metals, cyanide, pesticides/PCB, SVOC	Adjacent to former Eljer Plumbingware, about 50' upstream of Walnut St. bridge over Town Run. Area of sediment removal. CLP ID= EAJK7/MEAGJ7
TR-4B	~RM 0.8	sediment	metals, cyanide, pesticide/PCB, SVOC	Adjacent to former Eljer Plumbingware, just upstream of new stormwater retention pond. On edge of sediment removal area. CLP ID= EAJK6/MEAGJ6
GP-5	former Scott seed plant	soil direct push 4.0-8.0'	metals, cyanide, pesticides/PCB, SVOC	NW corner of former seed plant. SE corner of Eighth St. and Oak St. Near former RR tracks. CLP ID= ECGK/MEBKA6
GP-6	former Scott seed plant	soil direct push 4.0-8.0'	metals, cyanide, pesticides/PCB, SVOC	S. side of former seed plant along former loading dock. CLP ID= ECBD/MEAKB7
8 th St. Storm		sediment/ sludge	pesticides/PCB, SVOC	Storm sewer west of former seed co. and east of Town Run. At intersection of Walnut St. and Eighth St. CLP ID= EAJJ5

TABLE 2 PHASE II MILL CREEK SAMPLE LOCATIONS

Location	River Mile	Matrix	Analytes	Description
MC-8B	RM 18.6	sediment	metals, cyanide, pesticides/PCB, SVOC	Mill Creek, downstream of Town Run to determine extent of Town Run impacts. CLP ID= EAJJ7/MEBJT7; duplicate: EAJJ8/MEBJT8
MC-8A	RM 18.7	sediment	metals, cyanide, pesticides/PCB, SVOC	Mill Creek, downstream of Town Run confluence. Evaluate better sediment matrix than previous MC-9 sample. CLP ID= EAJK8/MEAGJ8

3.0 SAMPLE ANALYSES

All soil and sediment samples were analyzed for target analyte list (TAL) metals, semivolatile organic compounds (SVOCs), and pesticides/PCBs. These parameter lists cover the major

contaminants of concern identified in previous investigations.

4.0 ANALYTICAL RESULTS - SEDIMENT

Metals in Town Run and Mill Creek Sediment

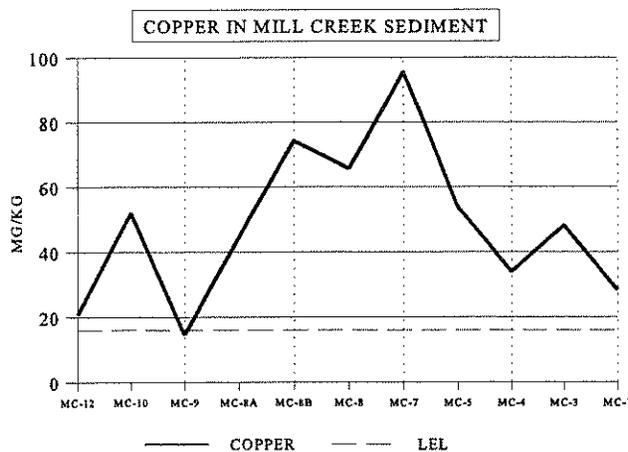
Tables 1 and 2 provide a complete summary of all sediment samples collected from Mill Creek and Town Run for both GI sampling events. The Phase II samples confirmed that the primary contaminants of concern in Mill Creek and Town Run are: copper, lead, and zinc. Elevated levels of these compounds may impact the integrity of biological communities in the Marysville portion of Mill Creek and Town Run. To determine potential impacts to the environment and ecological receptors, all metals concentrations were compared to the Lowest Effect Levels (LEL) and Severe Effect Levels (SEL) published by Ontario, Canada (Persuad et al. 1993). These sediment screening LELs and SELs were exceeded at various locations within Mill Creek and Town Run. As discussed in the September 1998 GI report, biological impacts have been documented during Ohio EPA, Division of Surface Water (DSW) sampling of Mill Creek in Marysville (Ohio EPA, 1997).

Arsenic and nickel were also elevated in both Town Run and Mill Creek sediments, but their presence in background samples and persistence suggests that they may be naturally occurring.

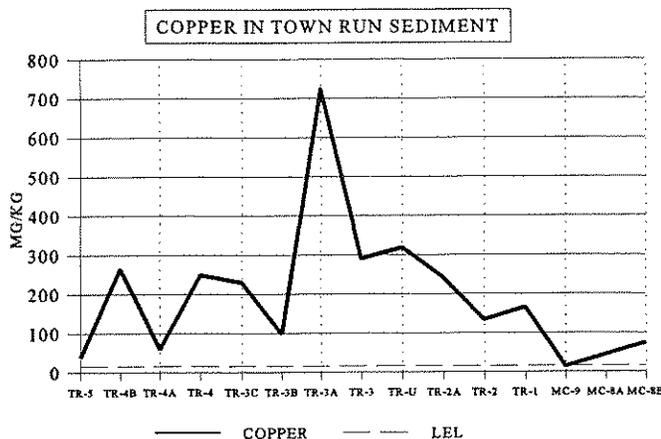
Discussion

The concentrations of copper, lead, and zinc were graphed in an upstream to downstream profile to portray the concentration trends of these contaminants in both Mill Creek and Town Run. For reference, MC-12 was located at River Mile (RM) 36; MC-10 to MC-5 were collected in the Marysville area, MC-9, MC-8A, and MC-8B were located downstream of Town Run; MC-4 and MC-3 were up and downstream of Crosses Run, respectively; and MC-1 was located at RM 1.6. Town Run sample locations are presented on Figure 1. Urban sources and non-point sources appear to have a major impact on increased metals concentrations in sediment of the Mill Creek watershed.

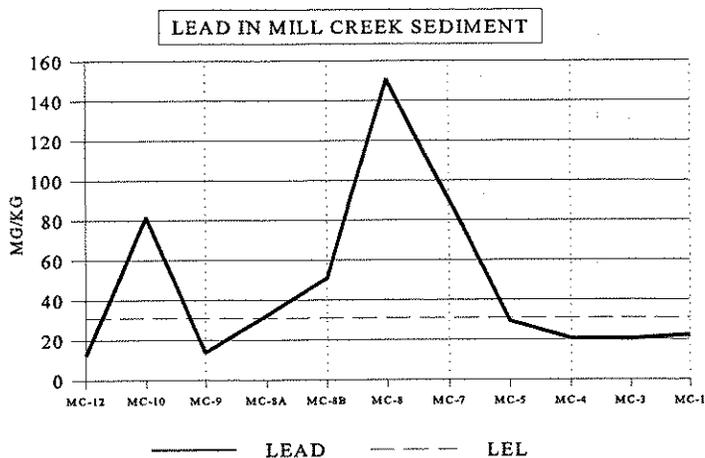
In Mill Creek sediment, copper ranged from 14.6 to 95.6 mg/kg. The LEL was exceeded in all but one sample. Due to its persistence, copper may be naturally elevated. Although concentrations of 2-3 times background (20.8 mg/kg) in the Marysville portion of Mill Creek (TR-10 to TR-7) are likely due to urban impacts. Town Run appears to contribute additional copper contamination as seen by the elevated levels at TR-8B, TR-8A, and TR-8.



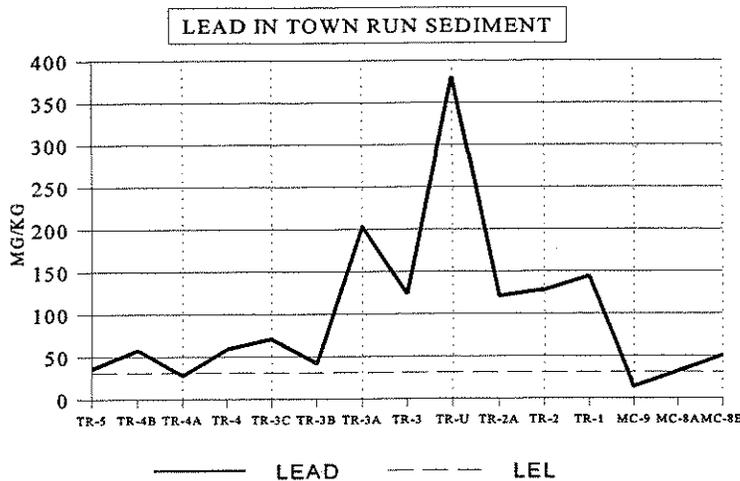
Town Run sediments showed significantly higher concentrations of copper than Mill Creek sediments. Copper concentrations in sediment ranged from 38.4 mg/kg to 720 mg/kg. Every sample location exceeded the LEL for copper. Concentrations were typically 4-6 times higher than in Mill Creek. Elevated copper levels are first observed between TR-4B to TR-4, which is adjacent and downstream from the former Eljer Plumbingware facility. The lower concentration at TR-4A is a result of sediment removal completed as part of remediation activities occurring at the former Eljer Plumbingware facility. The highest copper concentration at TR-3A is downstream from Eljer Plumbingware and a former lumber yard. A decreasing concentration trend is apparent in downstream locations to Mill Creek. The coarse nature of the sediment at MC-9 may not allow for an adequate concentration representation of the Town Run impacts to Mill Creek.



Lead was persistent in Mill Creek sediments and ranged from 12.4 to 151 mg/kg. The lead concentration profile for Mill Creek sediment also indicates urban impacts within Marysville. The increasing concentrations downstream of Town Run (MC-8B and MC-8A) suggest some impacts from Town Run, but other possible non-point source stormwater runoff and Ray Lewis & Sons discharge water may account for the higher concentrations at MC-8 and MC-7, respectively.

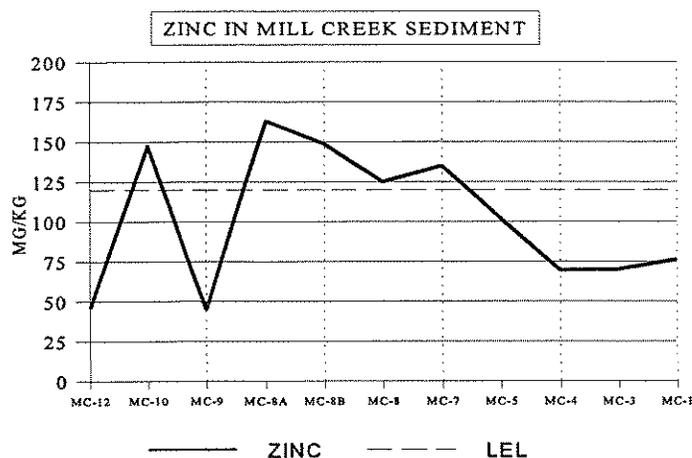


Lead ranged in concentration from 27.9 to 381 mg/kg in Town Run sediment. The LEL was exceeded in all but one sample. In addition, one sample (TR-U) in the culverted portion of the stream exceeded the SEL. In Town Run, the concentration profile shows the highest concentrations are located

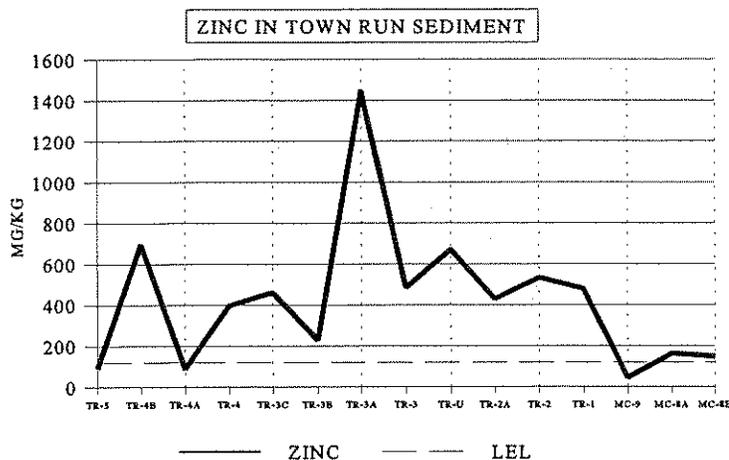


in downstream portions of Town Run in the most urbanized areas. Downstream migration from known lead contamination at the former Eljer Plumbingware facility may be the source of this contaminant. In addition, urban non-point sources may also contribute to these concentration levels.

Zinc ranged from 44.8 to 163 mg/kg in Mill Creek sediment. The concentration profile for zinc in Mill Creek sediment, once again shows elevated concentrations due to urban impacts in Marysville. Unknown urban impacts are present at MC-10. Impacts from Town Run are apparent in downstream samples MC-8B and MC-8A.

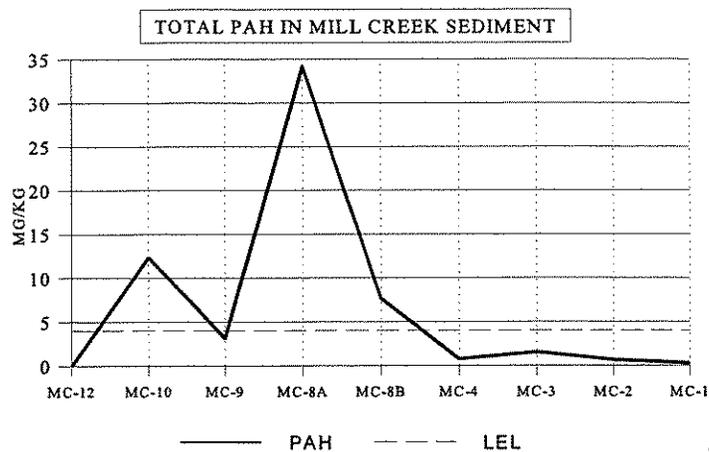


Zinc concentrations ranged from 88.8 to 1450 mg/kg in Town Run sediment. The lowest concentrations were found in the background (upstream) sample and at TR-4A where sediment removal activities were conducted. The LEL screening value was exceeded in 10 of 12 samples. One sample (TR-3A) exceeded the SEL. The former Eljer Plumbingware facility is the major source of zinc to Town Run. Additional urban sources or differential sediment migration may account for the highest concentration at TR-3A.



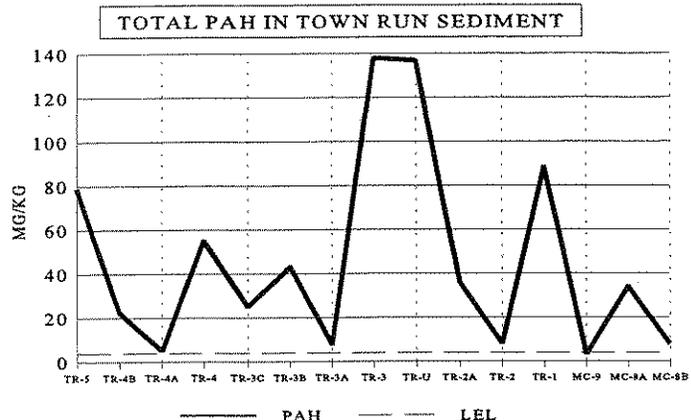
Semivolatiles in Town Run Sediment

Table 3 and 4 provide a summary of semivolatile compounds in Mill Creek and Town Run. Elevated levels of total polynuclear aromatic hydrocarbons (PAHs) were found within sediment samples where Mill Creek flows through Marysville. Total PAH concentrations ranged from below detection limits to 34.29 mg/kg.



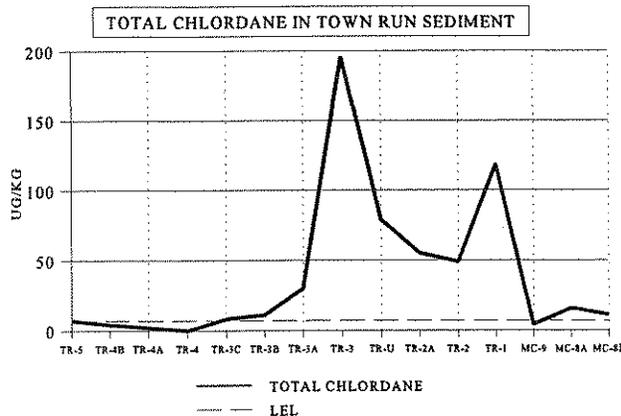
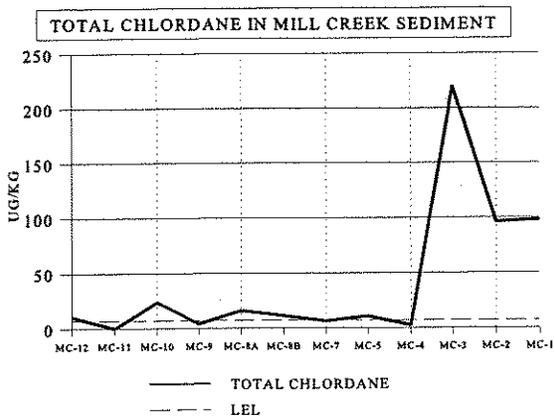
Impacts from PAH migration from Town Run are apparent in the PAH profile for Mill Creek.

As determined in the September 1998 GI Report, elevated levels of PAHs are persistent in Town Run. Total PAH concentrations ranged from 5.15 to 136.89 mg/kg. Levels fluctuated downstream suggesting various inputs from storm sewers and non-point sources. All exceed the LEL screening levels suggesting likely biological community impairment. PAH compounds may also be indicators of non-point source urban contamination since PAHs are commonly found in oil and their persistence and elevated levels may represent street runoff.



Pesticides/PCBs in Town Run Sediment

Tables 5 and 6 provide a summary of pesticides and PCBs identified in Mill Creek and Town Run. Low levels of pesticides were detected in all Mill Creek and Town Run sediments. Direct correlation to a point source is not evident and concentrations are likely a result of their prevalent use historically for both agricultural and urban pest control purposes. Concentration profiles for chlordane in both Mill Creek (BDL to 220 ug/kg) and Town Run (BDL to 196 ug/kg) show areas of elevated concentrations and significant LEL screening level exceedances.



Elevated levels of chlordane in downstream samples of Mill Creek have been attributed to the Scotts Company (Ohio EPA, 1998). Contaminant impacts to biological communities in Crosses Run are significant with less prevalent impacts in Mill Creek as determined by biocriteria studies by DSW (Ohio EPA, 1997). Chlordane in fish tissue has been documented from species

collected from Mill Creek (Ohio EPA, 1997). Chlordane in Town Run is likely related to its use as a pesticide around homes and buildings and, therefore, the increase in concentration is noted in the most urbanized area of Town Run. Identification of specific sources for pesticides is unlikely due to the persistence of these compounds and relatively low concentrations.

5.0 ANALYTICAL RESULTS - SOIL

Potential Source Area Soil Sampling

The September 1998 GI identified several potential sources along Town Run that warranted further evaluation. Since a high concentration of DDT at TR-2 (between Fourth and Fifth Streets and north of the culvert exit) was observed, confirmation sediment and soil samples on the stream banks were collected to determine the nature and extent of contamination.

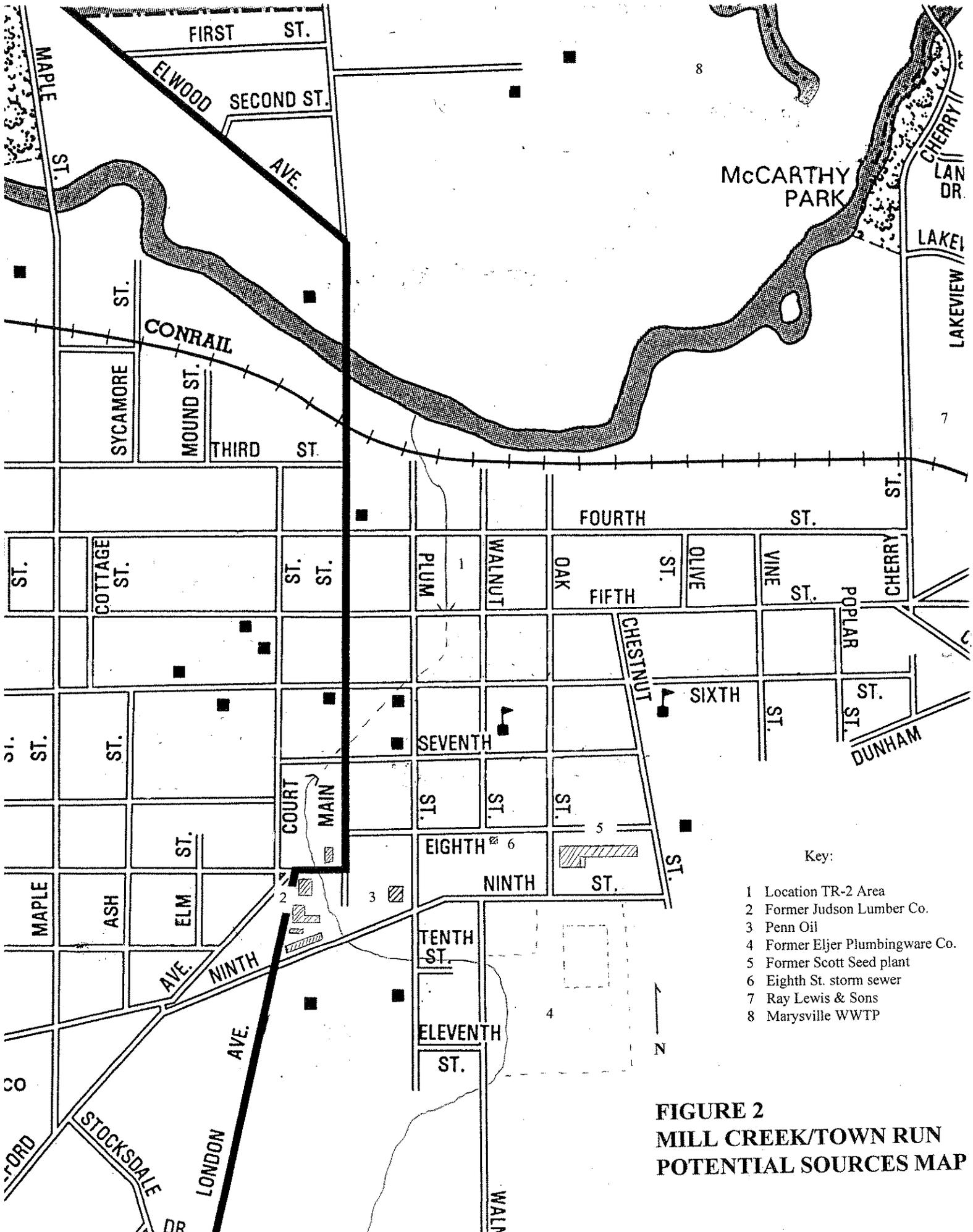
Based on historical information and existing businesses, the following potential source areas were also evaluated along Town Run: 1) the former Judson Lumber Yard, 2) adjacent to Penn Oil, 3) the former Eljer Plumbingware facility, 4) a former Scotts Company seed facility and 5) an Eighth Street storm sewer catch basin.

Table 7 provides a summary of soil samples collected at the various sites along Town Run. Figures 1 and 2 show a map of all sampling locations and potential sources evaluated.

Town Run Sample TR-2 Area

Sediment sample TR-2A failed to confirm the elevated DDT concentration. TR-2A had 5.1 ug/kg DDT compared to 6000 ug/kg for TR-2 (Ohio EPA, 1998). Two shallow (0-6 inches) soil samples, TR-SO1 and TR-SO2, were collected on the stream banks within the area of TR-2. Compared to a background soil sample the following metals were elevated in the two soil samples (see Table 7): cadmium, copper, lead, mercury, zinc, and cyanide. Lead exceeded the commonly used US EPA residential cleanup goal of 400 mg/kg. Low concentrations of pesticides (less than 78 ppb) were found in the soils of this area. DDT was detected in one sample at 9.8 ppb. The pesticide levels are consistent with concentrations found in Town Run sediments and likely represent non-point source urban uses. Therefore, a source area of pesticide contamination is not present in this area. TR-SO1 and its duplicate indicated the presence of PCBs of at least 1.5 mg/kg. Elevated levels of PAH compounds were identified in both samples. Total PAHs were 98.71 and 752.52 mg/kg.

US EPA, Region IX Preliminary Remediation Goals (PRGs) were utilized as a comparison to generic risk-based screening numbers to determine if contaminant concentrations are a concern (see Table 7). Several PRGs were exceeded for individual PAH compounds. Depending on actual exposure pathways and frequency of exposure, the soils along Town Run could pose a threat to human health. No apparent source for these compounds is readily visible. A gas station to the south could contribute contamination, but historical releases to Town Run, illegal dumping



McCarthy Park

Key:

- 1 Location TR-2 Area
- 2 Former Judson Lumber Co.
- 3 Penn Oil
- 4 Former Eljer Plumbingware Co.
- 5 Former Scott Seed plant
- 6 Eighth St. storm sewer
- 7 Ray Lewis & Sons
- 8 Marysville WWTP

FIGURE 2
MILL CREEK/TOWN RUN
POTENTIAL SOURCES MAP

on the stream banks, and street runoff are likely sources of the contamination. Historical information, maps, and aerial photos failed to show any significant point sources at this location.

Former Judson Lumber Yard

Historical information presented and discussed in the September 1998 GI Report indicate the operation of a lumber yard between Eighth and Ninth Streets on the west bank of Town Run. Additional buildings, which were also part of the facility, are located north of Eighth Street and on the east bank of Town Run (see Figure 2). Lumber operations have been conducted at the site since the 1890s, and most recently as the Judson Lumber Company. The Ohio Department of Transportation currently owns the property and is planning to utilize the area to relocate and improve Main Street. Most of the open areas of the site are covered with asphalt, although historically many activities may have been conducted over bare ground.

Table 7 shows the analytical results of the soil sampling. Three direct push borings and four samples (GP-1 to GP-3) were collected. Three samples were taken between the depths of 4 to 6 feet. One deep sample was taken at 8 to 9 feet. An additional boring (GP-4) was installed at the northern portion of the facility across Eighth Street. A single soil sample was collected from a depth of 6.5 to 8 feet. Analytical results from all five samples indicated no elevated concentrations of metals above background. Pesticides and PCBs were all below detection limits. Minor concentrations of PAH compounds were detected. Based on these results, it appears the former lumber yard may not be a source of contamination to Town Run. Products and chemicals used at the facility are unknown and direct releases to Town Run are unknown. The soil samples suggest no major releases of products or chemicals into site soils.

Adjacent to Penn Oil

One shallow soil sample (identified as Penn Oil, Table 7) was collected on the east bank of Town Run at a depth of 1.5 to 2.5 feet. This sample was collected to determine if there are any contaminants present in surface soils between the Penn Oil site and Town Run. The Penn Oil site is at least 100 yards east of Town Run, and was destroyed by fire in 1997. The soil sample did not indicate any metals above background concentrations. One detection of endosulfan II (1.7 ug/kg) and one detection of PCB (13 ug/kg) were observed. No PAHs were detected. It is unlikely that the Penn Oil site has contributed to Town Run contamination. Also of note, a railroad track was formerly located parallel and just north of Ninth Street in the area of the former Judson Lumber yard and Penn Oil site. This railroad could have been a possible source of contaminants.

Former Eljer Plumbingware Facility

Two sediment samples (TR-4B and TR-4A, see Table 7) were collected in Town Run adjacent to the former Eljer Plumbingware facility. Based on historical sampling from both Town Run and the facility, the former Eljer Plumbingware facility has contributed contaminants to Town Run.

Recent remedial activities involving waste removal and capping combined with newly installed surface runoff controls at the site should prevent future releases of contamination to Town Run. Sediment and surface water quality should improve in Mill Run as sediment redistribution and new deposition will reduce levels in the stream. Sediment removal activities immediately adjacent to the facility appear to have reduced metals contamination in Town Run adjacent to the former facility, as noted in the lower concentration levels observed at TR-4A.

Former Scotts Company Seed Plant

The Scott Company once operated a seed facility at Eighth and Oak Streets. The current owner indicated that the plant only processed seeds. Fertilizers were warehoused in a building across the street and to the west. The former seed warehouse is now being remodeled into a restaurant and microbrewery. To determine if this site is a possible source, two direct push borings were installed at this former facility. Two soil samples (GP-5 and GP-6, see Table 7) were collected from depths of 4-8 feet. Metals did not exceed background levels and pesticides/PCBs and SVOCs were all below detection limits.

Eighth Street Storm Sewer

A storm sewer catch basin was sampled on Eighth Street, west of the former seed plant. Due to a limited volume of sediment in the catch basin, only pesticides/PCBs and SVOCs were evaluated (8th Street, see Table 7). Small concentrations of pesticides were found, all below 7 ug/kg. No PCBs were detected. Total PAHs were 25.7 mg/kg. Compounds detected and their concentrations are similar to those found throughout the Town Run sampling area and reflect non-point source urban impacts.

6.0 CONCLUSIONS

Mill Creek primarily flows in a rural setting in central Ohio where primarily agricultural activities are conducted. The only urban influences to Mill Creek occur when it flows through Marysville. Well developed areas of vegetation along the stream banks, or riparian zones, are crucial to reduce impacts of surface runoff and help encourage a higher quality stream system. The width of the riparian zone along Mill Creek varies throughout the watershed, but typically is well developed, with wide zones occurring in the rural settings. Urbanization has reduced the riparian zone and various channelization activities have altered the streambed in and around Marysville. No significant riparian zones were observed along Town Run, which may directly reduce the biological community potential. Furthermore, Town Run has been further degraded by contamination and urban runoff.

Ohio EPA, DSW biocriteria sampling and monitoring has shown that large portions of Mill Creek meet the warm-water habitat use designation (Ohio EPA, 1997). Areas of impairment where use designations have not been met are documented by DSW and have been further

investigated in this geographic initiative (GI). Water quality impacts and sediment contamination generally increase in the urban setting of Marysville and downstream of Crosses Run. Significant degradation and biological impairments have been observed in Town Run and Crosses Run. Metals and PAH contaminants and physical impairments (i.e. channelization, debris, etc.) to the stream bed have hindered the water quality and biological communities of the Town Run tributary. Water quality impacts from nutrients and sediment contamination by pesticides have impacted Crosses Run. Less severe contamination has been observed in Mill Creek although discharges from the WWTP have impacted a portion of Mill Creek downstream of Marysville. Ray Lewis and Sons has impacted Mill Creek water quality with metals and cyanide contamination from their facility.

This GI investigation has confirmed contamination and summarized significant quantities of environmental data from numerous sampling events in the watershed. Major point sources were confirmed and are currently being addressed by Ohio EPA or the potentially responsible parties. The former Eljer Plumbingware is currently undergoing remediation and capping for redevelopment as a local park facility. Historical releases from this facility have been a source of metals contamination to Town Run, although this site may no longer be a source of metals contamination to Town Run. The Marysville WWTP has completed significant improvements to its treatment processes since the 1995 DSW investigation. Water quality improvements are expected and will be evaluated again during the next DSW study. DSW is working with Ray Lewis and Sons to identify the source of metals and cyanide contamination from their non-contact cooling discharge water. The Scotts Company is currently negotiating with the Ohio EPA and Ohio Attorney General to investigate and remediate, as necessary, various source areas at the facility. If each of these entities are able to reduce and eliminate contaminant releases from their facilities, then environmental improvements in Mill Creek can be expected.

The sampling for this Phase II investigation did not identify or confirm additional sources of contamination. The investigation provided better definition of the nature and extent of sediment contamination within Marysville. Significant PAH contamination in soils on the banks of Town Run between Fourth and Fifth Streets was identified although no source for this contamination was found. Viable potentially responsible parties are not likely to be found in the Town Run area. Businesses are small, locally owned with limited capacity to fund the costs of remedial activities. Furthermore, due to the urban setting and numerous non-point sources of contamination from surface runoff, linking contamination to point sources may be extremely difficult. Public awareness, education, and local stream beautification projects may be a better tool to improve the conditions of Town Run.

Potential Source Summary:

POTENTIAL SOURCE	IMPACTED STREAM	STATUS
Eljer Plumbingware	Town Run	Removal/capping ongoing by owner.
Former Lumber Co.	Town Run	Unlikely source based on sampling.
Penn Oil	Town Run	Unlikely source based on sampling.
Former Scott Seed facility	Town Run	Unlikely source based on sampling.
Ray Lewis & Sons Plating	Mill Creek	Ohio EPA, DSW and owner are investigating source.
Marysville WWTP	Mill Creek	Regulated by Ohio EPA/DSW. Various improvements completed since 1995.
The Scott Company	Mill Creek	Ohio EPA negotiations ongoing regarding various surface water discharges and former landfills.
Urban non-point sources	Town Run Mill Creek	Confirmed, due to persistence of PAH and pesticides in sediment. Sources not definable.

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TABLE 1 MILL CREEK GEOGRAPHIC INITIATIVE - PHASE II

MILL CREEK - METALS IN SEDIMENT - mg/kg

	MC-12	MC-10	MC-9	MC-8A	MC-8B	MC-8B	MC-8	MC-7	MC-5	MC-4	MC-3	MC-1
LEL SEL	8/97	8/97	8/97	06/10/98	06/10/98	06/10/98	8/97	8/97	8/97	8/97	8/97	8/97
aluminum	5690 J	7050 J	2880 J	5220	5750	4930	4060 J	5890 J	3760 J	6270 J	6300 J	11700 J
antimony	<1.8	<1.6	<1.2	<1	<1.2	<1.1	<1.6	<1.6	<1.9	<1.9	<1.5	<2
arsenic	6	3.8 J	7.4	9.3	7.4	6.6	4.4	8.9	7.7	6.1	6.8	8.8
barium	46.2	92.6	58.5	63.6	135	98.9	96.3	80.6	60.4	60.6	44.9	83.5
beryllium	0.4	0.5	0.2	0.4	0.4	0.4	0.3	0.4	0.2 J	0.4	0.4	0.6
cadmium	0.6	0.4	0.2 J	<0.9	0.6	0.6	0.9	0.4	0.3	0.4	0.5	0.3 J
calcium	33400	61800	139000	65900 J	115000 J	85300 J	69100	59800	104000	24800	26200	12400
chromium	26	110	8.5	17.1	5.1	8.1	10.6	13.5	22.8	13	11.5	14.8
cobalt	8.2	9	4.6	6.5	5.9	4.9	6.2	7.8	6.3	8.1	8.3	9.6
copper	16	110	20.8 J	52.1 J	14.6 J	44.8	65.7 J	95.6 J	53.8 J	34 J	48.2 J	28.2 J
iron	20000	40000	14500	18200	9450	14200	12100	15800	13700	16200	17100	23000
lead	31	250	12.4 J	81.8 J	13.9 J	32.3	151 J	91 J	29.4 J	20.7 J	20.4 J	22.3 J
magnesium	12600	25100	66200	28700	33100	23300	26900 *	22300	51000	11000	11800	6350
manganese	460	1100	334 J	339 J	360 J	272 J	241 J	345 J	210 J	428 J	363 J	384 J
mercury	0.2	2	<0.09	<0.08	<0.06	<0.2	<0.08	<0.08	<0.1	<0.1	<0.08	<0.1
nickel	16	75	18	21.7	9.7	16	15.2	21.3	38.3	27.1	21.8	25.3
potassium	954	10600	703	1050 J	1160 J	781 J	698	963	718	962	949	1440
selenium	<0.9	<0.8	<0.6	<0.6	<0.8	<0.7	<0.8	<0.8	<1	<1	<0.8	<1
silver	0.4	0.6	<0.2	<0.2	0.4 J	0.5 J	0.3	0.4	1.4	0.6	0.6	0.7
sodium	239	344	324	262	382	336	290	316	593	404	359	335
thallium	<1.3	1.3 J	<0.8	<1.4	<1.8	<1.7	<1.1	<1.1	<1.4	<1.4	<1.1	1.5 J
vanadium	13.7	17.3	8.7	12.6	18.3	14.4	11.1	14	9.4	14	14	21.7
zinc	120	820	45.8	148	44.8	163	125	135	102	69.5	70	76.2
cyanide	n/a	<0.2	0.4 J	0.1 J	<0.1	0.4 J	<0.2	<0.2	<0.2	n/a	n/a	n/a

n/a - not analyzed

LEL - Lowest Effect Level in sediment, Ontario

SEL - Severe Effect Level in sediment, Ontario

bold - exceeds LEL

MILL CREEK GEOGRAPHIC INITIATIVE - PHASE II

TABLE 2

TOWN RUN - METALS IN SEDIMENT - mg/kg

	TR-5	TR-4B	TR-4A	TR-4	TR-3C	TR-3B	TR-3A	TR-3	TR-3 (dup)	TR-U	TR-2A	TR-2	TR-1
LEL	SEL												
aluminum		8270 J	7910	8320 J	8360	6760	7190	5310 J	5690 J	5220 J	4910	2680 J	4270 J
antimony		<1.6	<1.1	<1.9	<1.1	<1.0	<0.9	<1.6	<1.5	3.7 J	<1.2	<1.2	<1.3
arsenic	6	15.1	10.5	9.4	14.5	8.4	8.6	8.4	8.3	10.6	8.2	6.1	10.5
barium		72.4	68.2	71	71.9	72.2	68.2	57	61.1	78.7	79.6	55	113
beryllium		0.7	0.5	0.5	0.6	0.5	0.5	0.4	0.5	0.4	0.4	0.3	0.4
cadmium	0.6	10	0.2	0.7	0.2	0.2	0.7	0.7	1.8	2.3	0.9	0.6	0.7
calcium		38600	13100 J	17100 J	35800 J	30000 J	26500 J	48700	44800	64000	43300 J	96300	71600
chromium	26	110	11.1	18.3	15.9	12.4	21.8	16.9	18.3	66.8	17.6	12.2	16.8
cobalt		15.6	7.5	11.2	11.7	9.6	7	8.8	9.5	9	6.9	6.3	7.5
copper	16	110	59.2	259 J	230	98	727	290 J	332 J	319 J	241	134 J	166 J
iron	20000	40000	13100	22400	21800	18600	14100	16200	18700	20300	11300	16900	19200
lead	31	250	57.9	58.8 J	70.9	42	204	124 J	144 J	387 J	121	128 J	145 J
magnesium		11500	4430	15200	13300	10400	10600	15900	15000	21600	15000	25900	23600
manganese	460	1100	389 J	502 J	634 J	372 J	294 J	309 J	310 J	289 J	182 J	368 J	336 J
mercury	0.2	2	<0.2	<0.1	<0.2	0.3	<0.1	<0.08	0.1 J	<0.1	<0.2	<0.06	<0.06
nickel	16	75	29.7	34.1	30.3	25.6	35.9	26.6	30.7	30.3	27.1	20.7	22.6
potassium		1190	1170 J	1240	1670 J	1310 J	1440 J	923	980	982	1470 J	458	839
selenium		<0.8	<0.6	<1	<0.7	<0.6	<0.6	<0.8	<0.8	<1.2	<0.8	<0.6	<0.6
silver		0.7	0.5 J	0.8	0.4 J	0.3 J	6.4 J	0.5	0.5	0.9	1 J	0.3	0.6
sodium		334	262	367	325	236 J	304	325	285	434	360	241	340
thallium		1.2 J	<1.5	<1.4	<1.6	<1.5	<1.4	<1.1	<1.1	<1.7	<1.8	1.2 J	<0.9
vanadium		24.4	15.3	18	21.9	15.7	16.1	14.1	16.9	15.9	14.2	9.4	13.3
zinc	120	820	697	394	461	229	1450	486	626	673	430	533	478
cyanide		<0.2	0.2 J	<0.2	0.2 J	0.2 J	0.3 J	<0.2	<0.2	<0.3	0.2 J	<0.1	<0.2

n/a - not analyzed

LEL - Lowest Effect Level in sediment, Ontario

SEL - Severe Effect Level in sediment, Ontario

bold - exceeds LEL

italics bold - exceeds SEL

TABLE 3 MILL CREEK GEOGRAPHIC INITIATIVE - PHASE II

MILL CREEK - SEMIVOLATILES IN SEDIMENT - mg/kg

	MC-12	MC-10	MC-09	MC-8A	MC-8B	MC-8B	MC-8B	MC-04	MC-03	MC-02	MC-01
LEL SEL	8/97	8/97	8/97	06/10/98	06/10/98	06/10/98	duplicate	8/97	8/97	8/97	8/97
methylphenol,4	BD	0.08 J	BD	BD	BD	BD	BD	BD	BD	BD	BD
naphthalene	BD	0.042 J	BD	BD	0.038 J	0.057 J	0.057 J	BD	BD	BD	BD
methylnaphthalene-2	BD	0.064 J	BD	0.066 J	0.027 J	0.041 J	0.041 J	BD	BD	BD	BD
acenaphthylene*	BD	0.087 J	0.045 J	BD	BD	BD	BD	BD	BD	BD	BD
acenaphthene*	BD	0.05 J	0.024 J	0.35 J	0.058 J	0.099 J	0.099 J	BD	BD	BD	BD
dibenzofuran	BD	0.053 J	0.027 J	0.25 J	0.045 J	0.067 J	0.067 J	BD	BD	BD	BD
fluorene*	0.19	4.8	0.074 J	0.54 J	0.086 J	0.13 J	0.13 J	BD	BD	BD	BD
phenanthrene*	0.2	28.5	0.96	5.2	0.81	1.3	1.3	0.058 J	0.12 J	0.04 J	0.047 J
anthracene*	0.22	11.5	0.22 J	1.1 J	0.16 J	0.25 J	0.25 J	BD	0.031 J	BD	BD
carbazole	BD	0.17 J	0.042 J	0.68 J	0.091 J	0.15 J	0.15 J	BD	BD	BD	BD
fluoranthene*	0.75	30.6	2.3	6.3	1.3	2.1	2.1	0.17 J	0.31 J	0.13 J	0.072 J
pyrene*	0.49	25.5	1.6	6.1	1.5	2.2	2.2	0.14 J	0.26 J	0.15 J	0.057 J
butylbenzylphthalate	BD	0.034 J	BD	BD	BD	BD	BD	BD	BD	BD	BD
benzo(a)anthracene*	0.32	44.4	0.89	3	0.66	0.9 J	0.9 J	0.061 J	0.13 J	0.056 J	0.037 J
chrysene*	0.34	13.8	1.3	2.8	0.8	1.1	1.1	0.079 J	0.15 J	0.062 J	0.039 J
bis(2-ethylhexyl)phthalate	BD	0.63	BD	BD	BD	BD	BD	BD	BD	BD	BD
di-n-octylphthalate	BD	0.068 J	BD	BD	BD	BD	BD	BD	BD	BD	BD
benzo(b)fluoranthene*	BD	1.5	0.32 J	3.9	0.95	1.2	1.2	0.085 J	0.17 J	0.09 J	0.054 J
benzo(k)fluoranthene*	0.24	40.2	0.37 J	1 J	0.33 J	0.51 J	0.51 J	0.027 J	0.075 J	BD	BD
benzo(a)pyrene*	0.37	43.2	0.97	2.5	0.6	0.85 J	0.85 J	0.057 J	0.13 J	0.05 J	BD
indeno(1,2,3cd)pyrene*	0.2	9.6	0.94	1.8 J	0.48 J	0.68 J	0.68 J	0.041 J	0.1 J	0.036 J	BD
dibenz(a,h)anthracene*	0.06	3.9	BD	0.43 J	0.11 J	0.14 J	0.14 J	BD	BD	BD	BD
benzo(g,h,i)perylene*	0.17	9.6	1.1	1.5 J	0.45 J	0.61 J	0.61 J	0.046 J	0.048 J	0.042 J	BD
Total PAH	4	300	0	34.29	7.7	12.07	12.07	0.764	1.542	0.656	0.306

*PAH compound

LEL- Lowest Effect Level in sediment , Ontario

SEL- Severe Effect Level in sediment, Ontario; based on 3% TOC

BD= Below Detection limits which ranged from 0.460 to 1.6 mg/kg

BD - exceeds LEL

TABLE 4 MILL CREEK GEOGRAPHIC INITIATIVE - PHASE II

TOWN RUN - SEMIVOLATILES IN SEDIMENT - mg/kg

	TR-5	TR-4B	TR-4A	TR-4	TR-3C	TR-3B	TR-3A	TR-3	TR-U	TR-2A	TR-2	TR-1
LEL SEL	8/97	06/10/98	06/10/98	8/97	06/10/98	06/10/98	06/10/98	8/97	8/97	06/10/98	8/97	8/97
methylphenol,4	BD	BD	BD	0.042 J	BD	BD	BD	BD	BD	BD	0.024 J	0.041 J
naphthalene	0.17 J	0.069 J	0.019 J	0.1 J	0.073 J	0.28 J	BD	0.38 J	0.91 J	0.071 J	BD	0.34 J
methylnaphthalene-2	0.18 J	0.054 J	0.098 J	0.067 J	0.049 J	0.12 J	BD	0.32 J	0.58 J	0.055 J	0.021 J	0.29 J
acenaphthylene*	0.13 J	BD	BD	0.09 J	BD	BD	0.049 J	BD	0.59 J	BD	0.11 J	0.41 J
acenaphthene*	1.1	0.33 J	0.051 J	0.66	0.22 J	0.97 J	0.1 J	3.4 J	1.8 J	0.18 J	0.056 J	1.2
dibenzofuran	0.76	0.24 J	0.038 J	0.36 J	0.19 J	0.67 J	0.065 J	1.9 J	1.2 J	0.24 J	0.052 J	0.95
fluorene*	0.19	4.8	0.34 J	0.053 J	0.25 J	1	0.1 J	3.4 J	1.8 J	0.32 J	0.093 J	1.6
phenanthrene*	0.2	28.5	3.5	0.58 J	3.9	8.3	0.89 J	25	18	4	0.88	13
anthracene*	0.22	11.1	0.67	0.069 J	0.5 J	1.7	0.17 J	7.4	2.5 J	0.64 J	0.23 J	3.2
carbazole	2	0.49 J	0.092 J	1.2	0.54 J	1.2	0.1 J	3.9 J	2.2 J	0.48 J	0.081 J	2.3
di-n-butylphthalate	BD	BD	BD	0.033 J	BD	BD	BD	BD	BD	BD	0.024 J	0.091 J
fluoranthene*	0.75	30.6	4.1	1	4.7	7.6	1.7	26	26	6.4	1.7	14
pyrene*	0.49	25.5	4	0.88	4.8	8	1.1 J	22	25	6.9	1.2	15
butylbenzylphthalate	0.035 J	BD	BD	BD	BD	BD	BD	BD	BD	0.5 J	BD	0.44 J
benzo(a)anthracene*	0.32	44.4	1.9	0.36 J	1.8	3.2	0.71 J	12	11	3	0.66	8.8
chrysene*	0.34	13.8	1.9	0.55	2.3	3.5	0.66 J	9.8	11	3.3	0.72	9.5
bis(2-ethylhexyl)phthalate	BD	BD	BD	0.5 J	BD	BD	BD	BD	BD	BD	BD	0.59
di-n-octylphthalate	0.034 J	BD	BD	0.1 J	BD	BD	BD	BD	BD	BD	BD	BD
benzo(b)fluoranthene*	8.3	2.4	0.66	6.1	2.7	3.7	0.94 J	13	14	4.8	0.99	7.9
benzo(k)fluoranthene*	0.24	40.2	0.97 J	0.22 J	1.1	1.4	0.27 J	3.3 J	4.5 J	1.6	0.24 J	2.6
benzo(a)pyrene*	0.37	43.2	1.6	0.39 J	1.8	2.6	0.61 J	9.7	10	2.9	0.66	6.4
indeno(1,2,3cd)pyrene	0.2	9.6	1.3	0.37 J	1.4	1.5	0.5 J	5	6.4	2.3	0.41	4.8
benzo(g,h,i)perylene*	0.17	9.6	1.1	0.34 J	1.1	1.3	0.46 J	5.3	6.8	2.2 J	0.47	5.1
Total PAH	4	300	22.48	5.15	25.17	43.27	7.66	137.9	136.89	36.24	8.189	88.71

*PAH compound

LEL- Lowest Effect Level in sediment , Ontario

SEL- Severe Effect Level in sediment, Ontario; based on 3% TOC

BD = Below Detection limit which ranged from 0.410 to 13 mg/kg

Bold - exceeds LEL

TABLE 5 MILL CREEK GEOGRAPHIC INITIATIVE - PHASE II

MILL CREEK- PEST/PCB IN SEDIMENT -ug/kg

	LEL	SEL	MC-12 8/97	MC-11 8/97	MC-10 8/97	MC-9 8/97	MC-8A 06/10/98	MC-8B 06/10/98	MC-8B duplicate	MC-7 8/97	MC-5 8/97	MC-4 8/97	MC-3 8/97	MC-2 8/97	MC-1 8/97
a-BHC	6	300	<2.8	<2.2	<13	<2	<4.9	<4.5	<2.8	<12	<2.6	<2.4	<15	<17	<3
b-BHC	5	630	<2.8	<2.2	<13	<2	<4.9	<4.5	<2.8	<12	<2.6	<2.4	<15	<17	<3
d-BHC	3	30	<2.8	<2.2	<13	<2	<4.9	4.8 J	0.92 J	1.2 J	<2.6	<2.4	<15	<17	<3
lindane	3	30	<2.8	1.9 J	<13	<2	<4.9	<4.5	<2.8	<12	2.2 J	1.3 J	<15	160 J	<3
heptachlor			2.2 J	<2.2	<13	<2	<4.9	4.5 J	<2.8	<12	0.83 J	<2.4	<15	5 J	9 J
aldrin	2	240	<2.8	<2.2	<13	<2	<4.9	<4.5	<2.8	2.8 J	<2.6	<2.4	<15	<17	<3
hept. epoxide	5	150	<2.8	<2.2	<13	<2	2.2 J	<4.5	<2.8	0.7 J	<2.6	<2.4	<15	<17	<3
endosulfan I			6.6 J	<2.2	15	2.8 J	<4.9	<4.5	<2.8	<12	<2.6	<2.4	120	41 J	60
dieldrin	2	2730	<5.4	<4.3	<26	<3.8	4.2 J	2.2 J	3.1 J	4.6 J	2.8 J	2.7 J	<29	<32	1.8 J
DDE- 4,4	5	570	<5.4	<4.3	3.2 J	<3.8	2.2 J	9.3	8.8 J	3.3 J	<5	<4.6	<29	<32	<5.9
endrin	3	3900	<5.4	<4.3	<26	<3.8	<9.4	<8.7	<5.5	<24	<5	<4.6	7.5 J	<32	2.1 J
endosulfan II			<5.4	<4.3	<26	<3.8	3.4 J	<8.7	<5.5	<24	<5	<4.6	<29	<32	<5.9
DDD-4,4	8	180	<5.4	<4.3	<26	<3.8	5 J	37	32	4.6 J	3 J	1.4 J	<29	<32	<5.9
endosulfan sulfate			<5.4	<4.3	<26	1.4 J	<9.4	<8.7	<5.5	1.9 J	<5	<4.6	<29	<32	6.4
DDT-4,4	7	360	1.8 J	<4.3	<26	2.7 J	2.4 J	<8.7	2 J	2.4 J	<5	2.2 J	21 J	<32	5.2 J
methoxychlor			<28	<22	<130	<20	<48	8.5 J	3.7 J	<120	<26	<24	<150	<170	<30
endrin ketone			<5.4	<4.3	<26	1.2 J	<9.4	<8.7	<5.5	1.8 J	<5	<4.6	<29	<32	<5.9
endrin aldehyde			<5.4	<4.3	<26	<3.8	<9.4	<8.7	<5.5	<24	<5	<4.6	<29	<32	<5.9
a-chlordane	7	180	5.9 J	<2.2	14	2.7 J	7.8 J	5.2 J	8.1 J	<12	5.7 J	1.4 J	120	36 J	54
g-chlordane	7	180	4.7 J	<2.2	9.5 J	1.5 J	7.9 J	5.8	6.1 J	6.3 J	4.9 J	0.92 J	100	30 J	44 J
toxophene			<280	<220	<1300	<200	<480	<450	<280	<1200	<260	<240	<1500	<1700	<300
PCBs			<54	<43	<260	<38	<94	<87	<55	<240	<50	<46	<290	<320	<59

LEL - Lowest Effect Level in sediment, Ontario
 SEL - Severe Effect Level in sediment, Ontario; based on 3% TOC
Bold - exceeds LEL
Bold italics - exceeds SEL

TABLE 6 MILL CREEK GEOGRAPHIC INITIATIVE - PHASE II

TOWN RUN - PEST/PCB IN SEDIMENT - ug/kg

	LEL	SEL	TR-4B		TR-4A		TR-3C		TR-3B		TR-3A		TR-3		TR-2A	
			TR-5	06/10/98	06/10/98	TR-4	06/10/98	TR-3C	06/10/98	TR-3B	06/10/98	TR-3	dupl	TR-U	06/10/98	TR-2
a-BHC	6	300	<13	<2.9	<2.3	<14	<2.5	<2.7	<22	<12	<14	<14	<42	<14	<14	
b-BHC	5	630	<13	<2.9	<2.3	<14	<2.5	<2.7	<22	<12	<14	<14	<42	<14	<14	
d-BHC	3	30	<13	<2.9	<2.3	<14	<2.5	0.66 J	<22	<12	<14	<14	<42	<14	<14	
lindane	3	30	<13	<2.9	<2.3	<14	<2.5	<2.7	<22	<12	<14	<14	<42	<14	<14	
heptachlor	2	240	<13	0.9 J	<2.3	<14	0.62 J	<2.7	14 J	14 J	14 J	4.2 J	<42	<42	7.2 J	
aldrin	2	240	<13	<2.9	<2.3	<14	<2.5	<2.7	<22	<12	<14	8.2 J	<42	<42	5.6 J	
hept. epoxide	5	150	<13	0.79 J	<2.3	<14	<2.5	<2.7	8.4 J	9.3 J	9.3 J	5.3 J	<42	<42	7.8 J	
endosulfan I	5	150	<13	<2.9	<2.3	<14	<2.5	<2.7	110 J	130	49 J	49 J	33 J	33 J	64 J	
dieldrin	2	2730	<25	4.1 J	1 J	<27	1.8 J	2.4 J	3.5 J	6 J	6 J	<27	<81	<81	11 J	
DDE-4,4	5	570	<25	1.7 J	0.62 J	<27	2.2 J	<5.2	2.6 J	<24	<24	12 J	63 J	63 J	17 J	
endrin	3	3900	<25	<5.7	<4.4	8.6 J	<4.9	<5.2	27 J	7.2 J	7.2 J	<27	<81	<81	<28	
endosulfan II	5	570	<25	<5.7	<4.4	<27	<4.9	<5.2	<43	<24	<24	<27	<81	<81	5 J	
DDD-4,4	8	180	<25	4.4 J	0.62 J	<27	7.3 J	5 J	7.5 J	<24	<24	11 J	370 J	370 J	7.8 J	
endosulfan sulfate	5	570	<25	<5.7	<4.4	<27	<4.9	<5.2	<43	<24	<24	7.3 J	<81	<81	9.5 J	
DDT-4,4	7	360	<25	1.5 J	<4.4	<27	2.6 J	1.3 J	3.8 J	26 J	26 J	11 J	6000 J	6000 J	40	
methoxychlor	5	570	<130	3.1 J	1.9 J	<140	2.7 J	2.3 J	3.2 J	<120	<120	<140	<420	<420	<140	
endrin ketone	5	570	<25	<5.7	<4.4	<27	<4.9	<5.2	26 J	<24	<24	22 J	<81	<81	<28	
endrin aldehyde	5	570	<25	<5.7	<4.4	<27	<4.9	<5.2	<43	<24	<24	<27	<81	<81	16 J	
a-chlordane	7	180	7 J	2.2 J	1.1 J	<14	5.1 J	6.2 J	18 J	120	120	46 J	30 J	30 J	60 J	
g-chlordane	7	180	<13	1.8 J	0.9 J	<14	3 J	4.6 J	12 J	120	120	33 J	19 J	19 J	59 J	
toxophene	5	570	<1300	<290	<230	<1400	<250	<270	<2200	<1200	<1200	<1400	<4200	<4200	<1400	
PCBs	5	570	<250	<57	<44	<270	<49	<52	230 J	<240	<240	<270	<810	<810	<280	

LEL - Lowest Effect Level, Ontario
 SEL - Severe Effect Level in sediment, Ontario; based on 3% TOC
Bold - exceeds LEL
Bold italics - exceeds SEL

TABLE 7

MILL CREEK GEOGRAPHIC INITIATIVE - PHASE II

TOWN RUN POTENTIAL SOURCE EVALUATION

6/10/98 SOIL SAMPLES - mg/kg

PRG mg/kg	storm 8th St.	Town Run		Former Lumber Yard						Former Scott Co.		
		Penn Oil	TR-SO1 duplicate	TR-SO2	GP-1	GP-2A	GP-2B	GP-3	GP-4	GP-5	GP-6	BKG
75000	17800	7490	6780	8270	22400	22500	11800	31200	19100	13200	11500	34800
30	<0.7	2.3 J	2.1 J	1.7 J	1 J	1 J	<0.7	1.4 J	0.08 J	<0.7	0.9 J	<0.8
0.38	24.2 J	12.6 J	13 J	11.5 J	18.4 J	12.6 J	16.4 J	17.4 J	9.5 J	15.8 J	20 J	12.9 J
5200	191	215	210	82.3	118	238	67.4	201	124	85.5	86.8	205
150	1	0.5	0.5	0.5	1	1.2	0.6	1.4	1	0.7	0.6	1.6
37	<0.2	3.9	3.6	0.7	<0.2	0.5	<0.2	<0.2	<0.2	<0.2	<0.2	0.5
calcium	57500	134000	134000	100000	5860	4320	73300	4790	6920	111000	88400	6220
chromium	210	22.5 J	22.3 J	21.3 J	27 J	30 J	16 J	37.5 J	22.7 J	17.2 J	15.9 J	38.7 J
cobalt	3300	14.3	5.7	6	16.2	28	14.5	13.4	14.9	9.6	11.5	13.3
copper	2800	41	551	326	29.6	26.5	26.2	28.3	24	28.2	27.9	49.1
iron	31400	17100	20600	16600	33100	32300	23400	38900	32000	26200	28600	32700
lead	400	30.6 J	671 J	236 J	16.3 J	15.1 J	12.1 J	17 J	19.9 J	12.4 J	13.7 J	19.5 J
magnesium	11400	36800	34500	31900	5190	5170	22400	6720	4000	28600	26700	6540
manganese	639	400	388	371	512	1180	355	565	1390	484	374	609
mercury	22	0.1 J	10.9	12.1	0.5	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06
nickel	1500	41.1	29	51.4	46.2	48.6	33.9	48.3	35.6	32.8	33.1	62
potassium	3790	1710	1480	1970	4160	4390	3570	5700	3440	3790	3220	5150
selenium	370	<0.7	1.2 J	<0.7	1 J	1.5 J	<0.7	1.8 J	<0.7	<0.7	<0.7	1.3 J
silver	370	<0.2	1 J	<0.8	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.3
sodium	249	244	244	261	215	376	297	275	268	295	269	289
thallium	1.9	0.9	<0.9	<0.9	3	2.2	2.6	2.9	1.3	1.9	2.1	2.6
vanadium	520	44.8	20.4	18	23	54.9	27.9	67	45.6	29.8	30.5	64.7
zinc	22000	111	564	521	475	97.1	64.4	130	92.6	90.6	84.2	145
cyanide	1100	1.2 J	3.6 J	3.4 J	<0.06	0.1 J	0.07 J	0.07 J	<0.06	0.2 J	4 J	0.1 J

TABLE 7 - continued
TOWN RUN POTENTIAL SOURCE AREA EVALUATION
6/10/98 SOIL SAMPLES - mg/kg

PRG	storm	Town Run		Former Lumber Yard				Former Scott Co.							
		8th St.	Penn Oil	TR-SOI	duplicate	TR-S02	GP-1	GP-2A	GP-2B	GP-3	GP-4	GP-5	GP-6	BKG	
Pesticides/PCBs															
endosulfan II	0.0029J	0.0017 J													
PCBs	0.2	BDL	0.013 J	1.5 J	2.1 J										
dieldrin	0.028	0.0026J													
4,4-DDE	1.7	0.0067J		0.0014 J	0.0016 J										
4,4-DDD	2.4	0.0045J		0.0057 J	0.0067 J										
4,4-DDT	1.7					0.0098 J									
a-chlordane	1.6	0.0050J		0.0054 J	0.0071 J	0.0038 J									
b-chlordane	1.6	0.0035J		0.012 J	0.015 J	0.0087 J									
endrin	16			0.078 J	0.100 J										
endrin ketone					0.045 J										
SVOC															
PRG	8th St.	Penn Oil	TR-SOI	duplicate	TR-S02	GP-1	GP-2A	GP-2B	GP-3	GP-4	GP-5	GP-6	BKG		
						BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL		
methylphenol,4	270	9.1 J	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL		
naphthalene	55	BDL	0.220 J	BDL	1.4 J										
methylnaphthalene-2		BDL	0.110 J	BDL	0.650 J										
acenaphthylene*		BDL	0.260 J	BDL	0.820 J										
acenaphthene*	2600	BDL	0.53	BDL	6.1 J										
dibenzofuran	210	BDL	0.38	BDL	4.7 J										
fluorene*	1800	BDL	0.62	BDL	8.6 J										
phenanthrene*		3.0 J	17	4.9 J	120										
anthracene*	14000	BDL	1.4	0.73 J	12										
carbazole	22	0.610 J	1.2	0.55 J	14										
fluoranthene*	2000	4.2 J	24	9.9	180										
pyrene*	1500	3.7 J	13	6.9 J	96 J										
benzo(a)anthracene*	0.56	1.9 J	5.9	3.3 J	48										
chrysene*	56	2.5 J	8.1	5.0 J	60			0.021 J							
benzo(b)fluoranthene*	0.56	3.1 J	8.7	3.6 J	46										
benzo(k)fluoranthene*	5.6	1.0 J	5.4	4.3 J	48										
benzo(a)pyrene*	0.056	1.9 J	7	4.4 J	50										
indeno(1,2,3cd)pyrene*	0.56	2.3 J	3.5	3.6 J	37										
benzo(g,h,i)perylene*		2.1 J	3.3	4.8 J	40										
Total PAH		25.7	98.71	51.43	752.52										

*PAH compound
 PRG = Region IX Preliminary Remediation Goal, residential (expires 5/1/99)

APPENDIX A

Due to its size, the CLP Data Package was not included in the scanned image of this report. If interested in the CLP Data Package, please contact the Division of Emergency and Remedial Response, Central District Office.

APPENDIX B

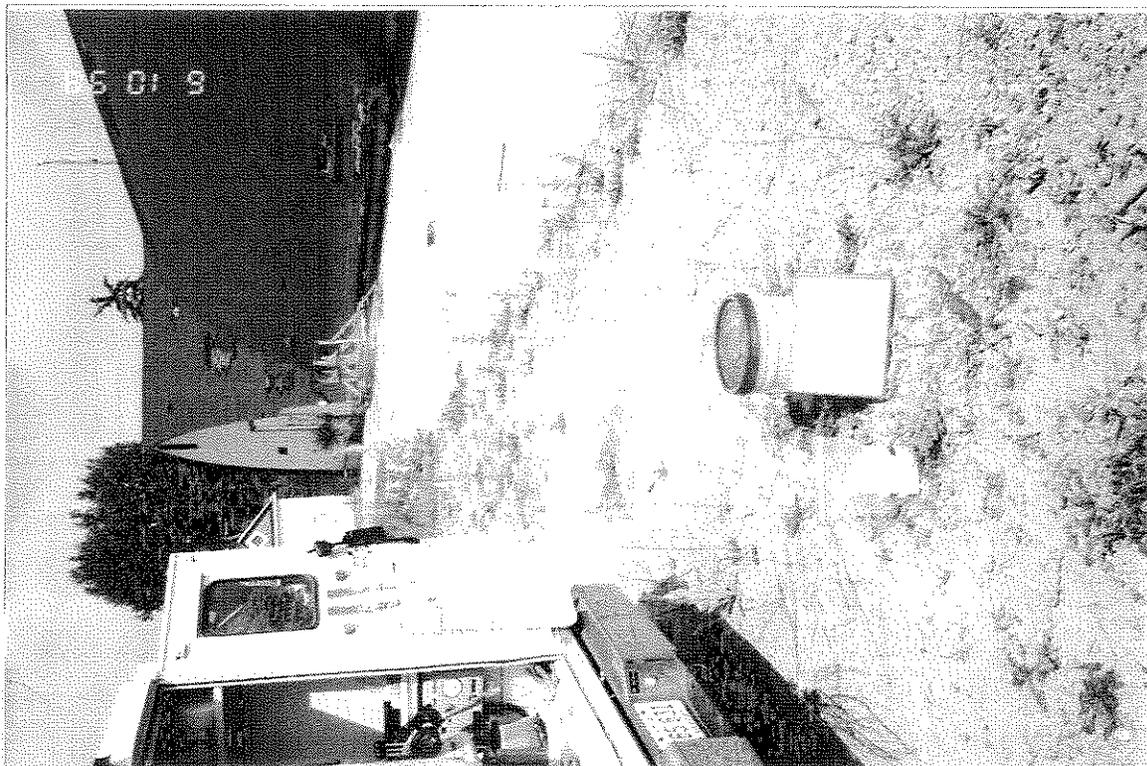


Photo No: 1 Sample No: ECGK/MEBKAO Date: June 10, 1998
Orientation: Northwest
Description: Geoprobe soil sample collected from former Judson Lumber Company (GP1).

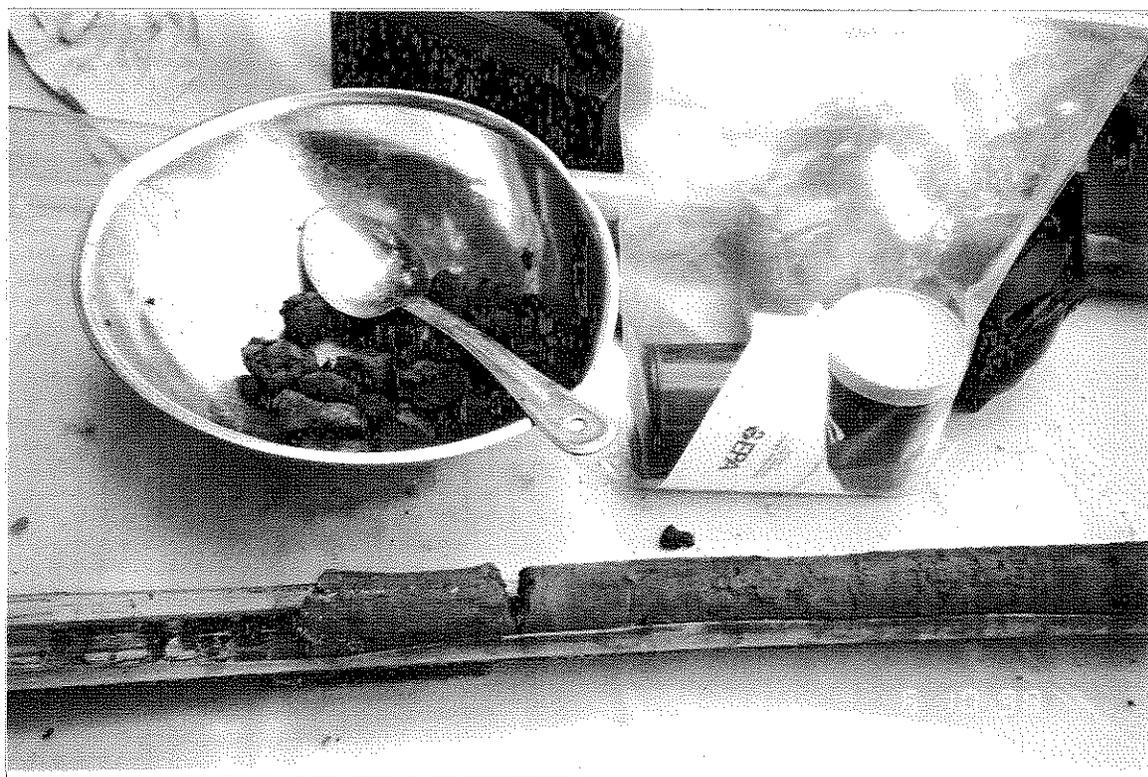
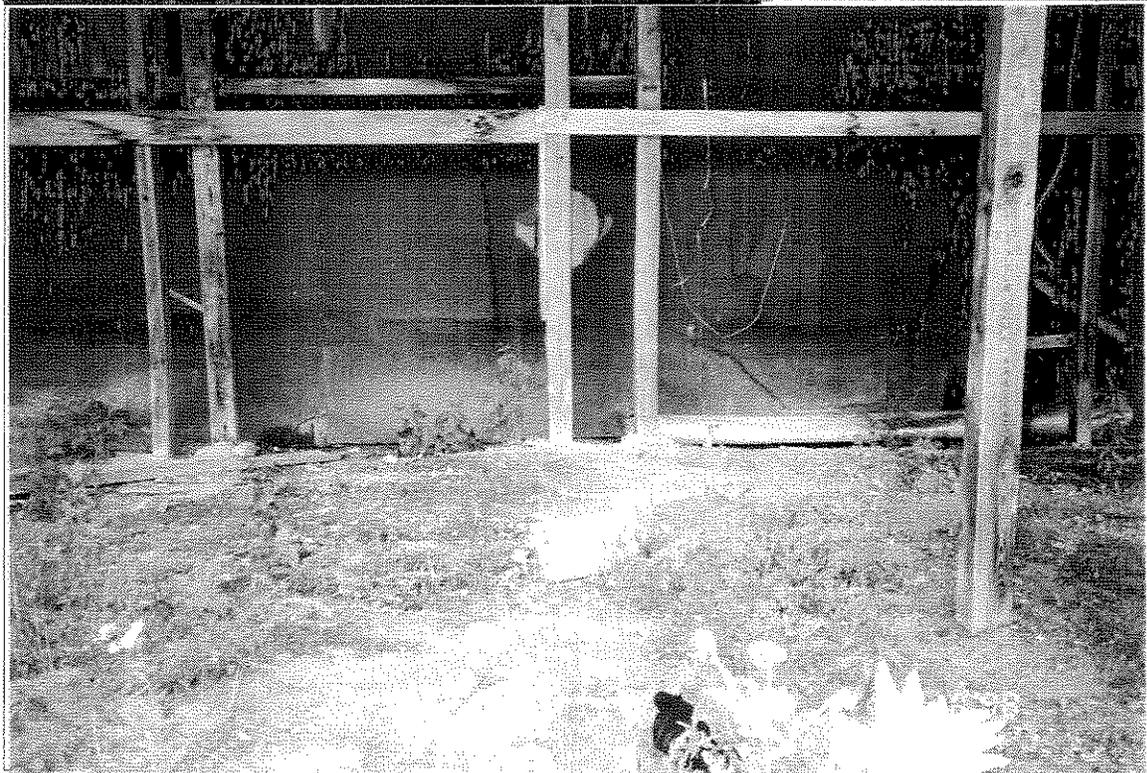


Photo No: 2 Sample No: ECGK/MEBKAO Date: June 10, 1998
Orientation:
Description: Close up view of core and sample (GP1).



Photo No: 3
Sample No. ECGK/MEBKA1
and 2
Date: June 10, 1998
Orientation: Northwest
Description: Geoprobe soil
samples collected from former
Judson Lumber Company
(GP2A and GP2B).

Photo No: 4
Sample No: ECGK/MEBKA3
Date: June 10, 1998
Orientation:
Description: Geoprobe soil
sample collected from former
Judson Lumber Co. (GP3).



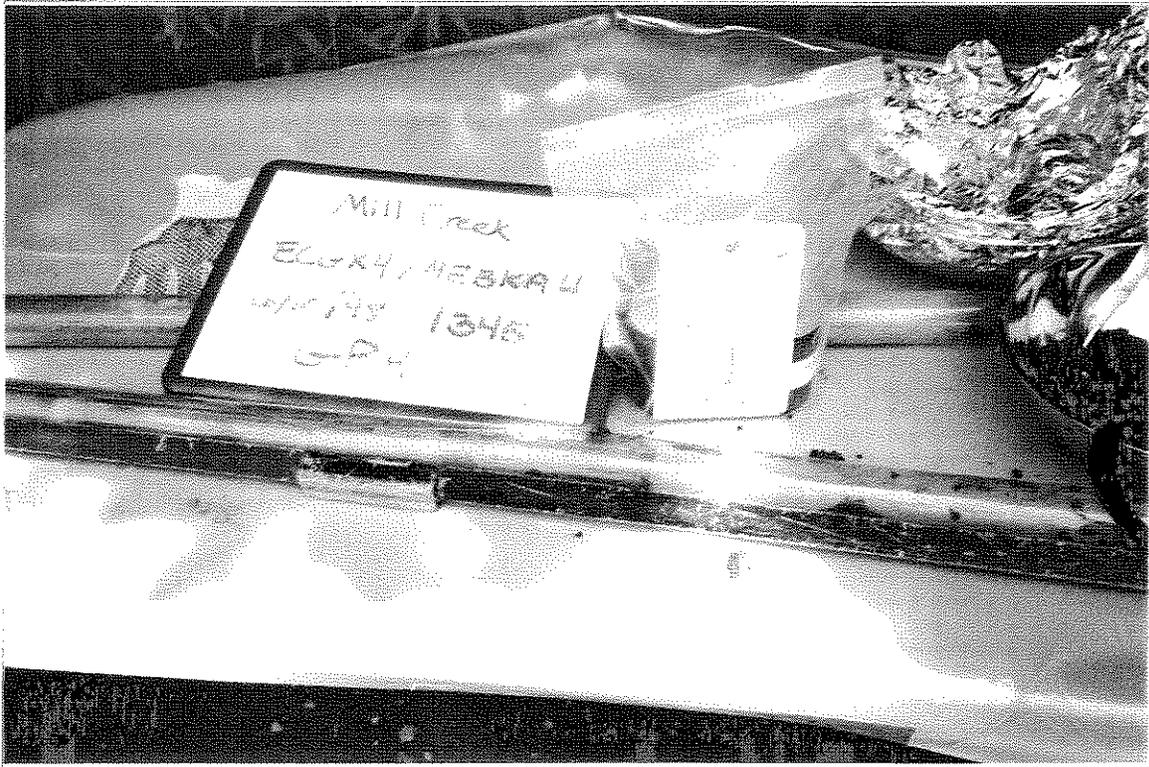


Photo No: 5

Sample No: ECGK/MEBKA4

Date: June 10, 1998

Orientation:

Description: Geoprobe soil sample collected from former Judson Lumber Company (GP4).

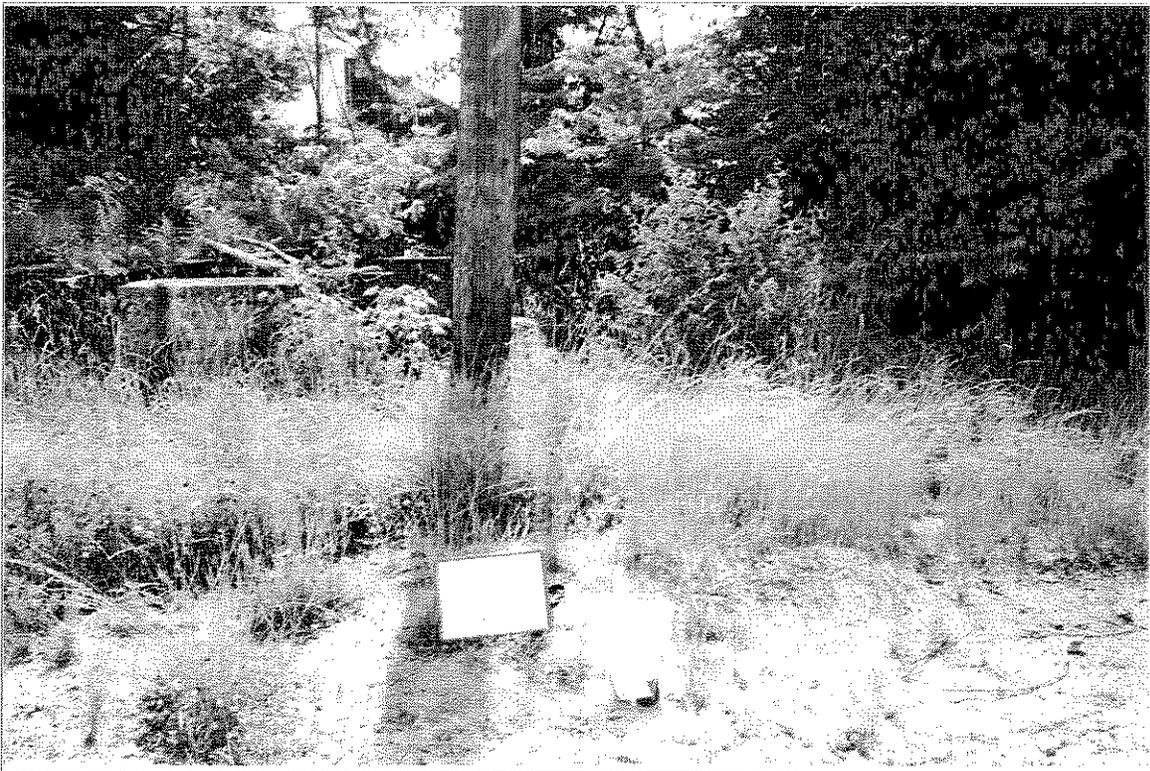


Photo No: 6

Sample No: ECBD/MEAKB8

Date: June 10, 1998

Orientation: West

Description: Soil sample collected from Penn Oil area across Town Run (East side) from Judson Lumber Co.



Photo No: 7
Sample No. ECGK/MEBKA5
Date: June 10, 1998
Orientation: Southwest
Description: Background soil sample collected in vacant, park-like area southeast of site on East side of Town Run.



Photo No: 8
Sample No: ECGK/MEBKA6
Date: June 10, 1998
Orientation: Southeast
Description: Geoprobe soil sample collected from northwest corner of former Scotts Seed Elevator (GP5).



Photo No: 9 Sample No: ECBD/MEAKB7 Date: June 10, 1998
Orientation: North
Description: Geoprobe soil sample collected from loading dock area of former Scotts Seed Elevator building (GP6).



Photo No: 10 Sample No: EAJK/MEAGJ8 Date: June 10, 1998
Orientation:
Description: Sediment sample collected from Mill Creek downstream of Town Run.

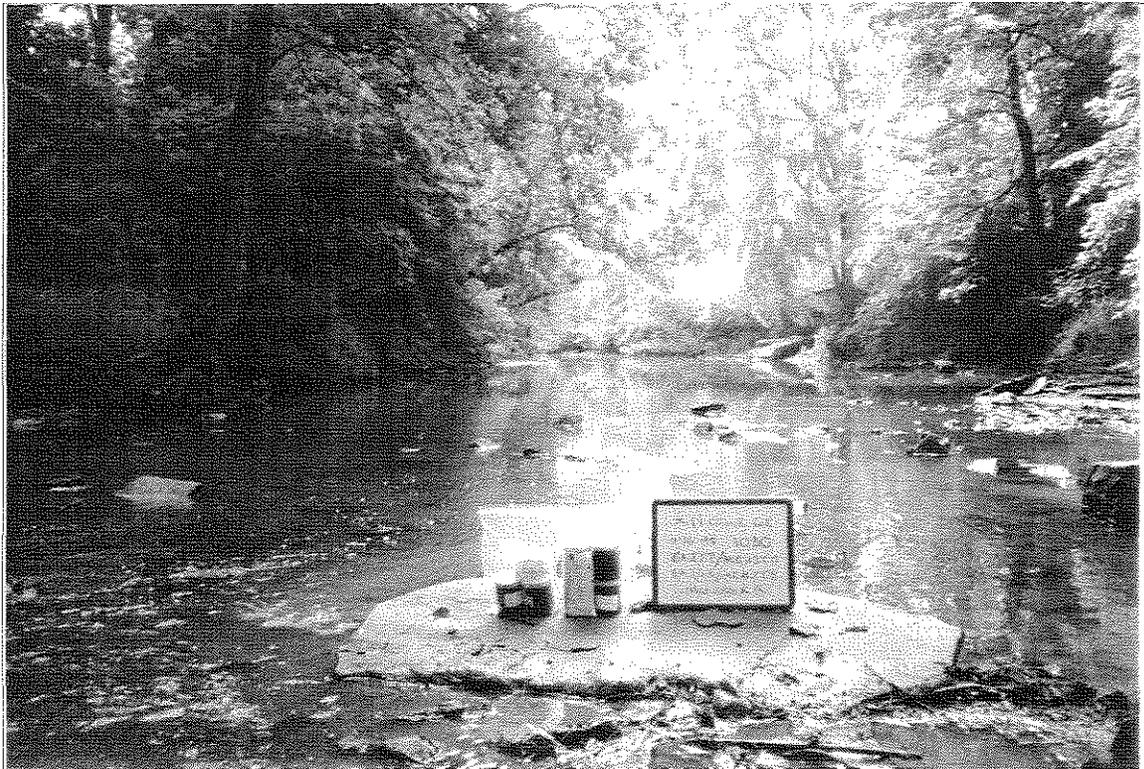


Photo No: 11 Sample No: EAJJ/MEBJT7 and 8 (Dup) Date: June 10, 1998
Orientation:
Description: Sediment sample collected from Mill Creek approx. 200 feet downstream of
EAJK/MEAGJ8.



Photo No: 12 Sample No: EAJJ/MEBJT6 Date: June 10, 1998
Orientation:
Description: Sediment sample collected from Town Run between National City Bank & BP.



Photo No: 13 Sample No: ECGK/MEBKA7 & 8 (Dup) Date: June 10, 1998
Orientation:
Description: Soil sample collected from west bank of Town Run adjacent to sediment sample location for EAJJ/MEBJT6.

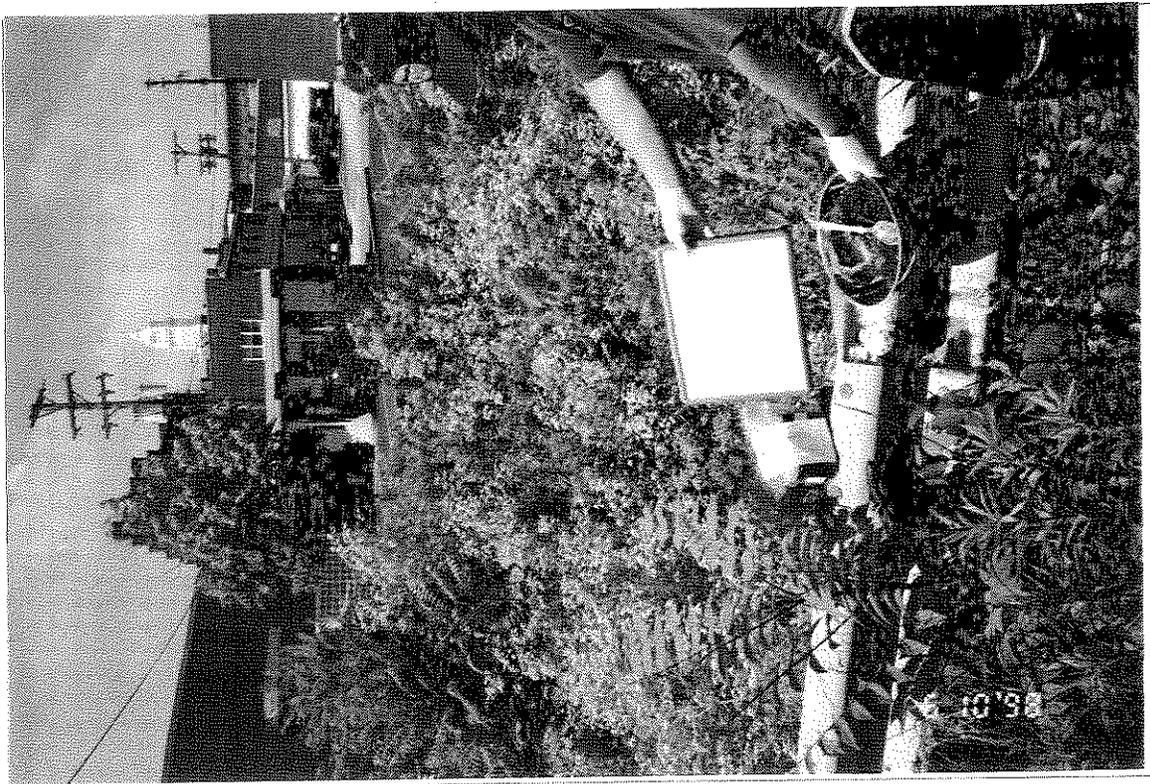
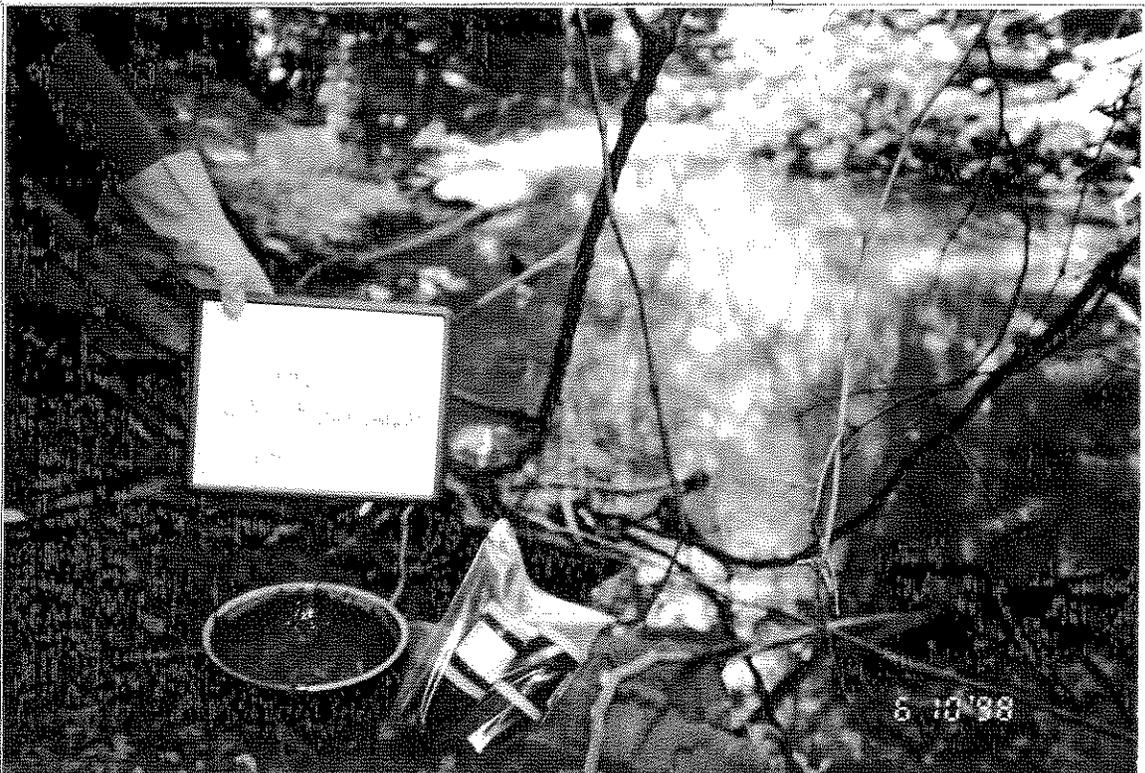


Photo No: 14 Sample No: Date: June 10, 1998
Orientation:
Description: Soil sample collected from east bank of Town Run north of sample location EAJJ/MEBJT6 (angle of photo is incorrect, but location is accurate).



Photo No: 15
Sample No. EAJK/MEAGJ3
Date: June 10, 1998
Orientation:
Description: Sediment sample collected from Town Run near the intersection of Main Street and Eighth Street.

Photo No: 16
Sample No: EAJK/MEAGJ4
Date: June 10, 1998
Orientation:
Description: Sediment sample collected from Town Run near Judson Lumber culvert.



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Photo No: 17 **Sample No:** EAJK/MEAGJ4 **Date:** June 10, 1998
Orientation:
Description: Culvert near sample location appeared to be draining sanitary sewage.



Photo No: 18 **Sample No:** EAJK/MEAGJ5 **Date:** June 10, 1998
Orientation:
Description: Sediment sample collected from Town Run adjacent to Judson Lumber, but upstream of EAJK/MEAGJ4 near Penn Oil.



Photo No: 19
Sample No. EAJK/MEAGJ6
Date: June 10, 1998
Orientation:
Description: Sediment sample collected from Town Run adjacent to former Eljer Plumbingware property, upstream of Eljer retention pond.

Photo No: 20
Sample No: EAJK/MEAGJ7
Date: June 10, 1998
Orientation:
Description: Sediment sample collected from Town Run adjacent to Eljer, downstream of retention pond.





Photo No: 21
Sample No. EAJJ5
Date: June 10, 1998
Orientation:
Description: Sediment sample collected from storm sewer locate on 8th Street near Walnut Street intersection, downstream of former Scotts Company seed & fertilizer warehouses.

Photo No: 22
Sample No: EAJJ5
Date: June 10, 1998
Orientation:
Description: Close up view of storm sewer.

