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915152

NIAGARA MOHAWK

NIAGARA MOHAWK POWER CORPORATION/ 300 ERIE BOULEVARD WEST, SYRACUSE, NEW YORK 13202-4250 TELEPHONE (315) 474-1511

December 23, 1997

Martin L. Doster, P.E.
Regional Engineer - Hazardous Waste Remediation
New York State Department of
Environmental Conservation
270 Michigan Avenue
Buffalo, NY 14203-2999

RE: GM - Saginaw Site (# 915152)
City of Buffalo, Erie County

Dear Mr. Doster:

Enclosed herewith for your review is the evaluation report prepared by Geomatrix Consultants, Inc. ("Geomatrix"), on all the reports and data provided to Niagara Mohawk Power Corporation ("NMPC") by General Motors ("GM") relating to GM's investigation at the former GM-Saginaw Site ("Site"). As more fully set forth in the report, Geomatrix's evaluation identifies several data deficiencies, data gaps and misinterpretations which do not support GM's consultants ("EMCON") conclusion that PCB contamination in the southern portion of the GM facility migrated from a purported "secondary source" located east of the GM facility.

Further, there is no evidence that NMPC's substation is impacting the Site. An internal review of NMPC's operational records indicate that Kensington Terminal substation drainage is tied into the municipal storm sewer system. It should be noted that EMCON has inaccurately stated that NMPC's substation drained into the former Scajaquada Creek channel. The filling of the former Scajaquada Creek channel occurred in the 1920s or 1930s. This predates the construction of Kensington Terminal substation in the 1950s. Therefore, NMPC's substation did not contribute surface runoff or storm sewer discharges to Scajaquada Creek. Further, there are no recorded spills, releases or fires at this substation. There is no evidence of underground storage tanks or any petroleum bulk storage operations at this facility.

NIAGARA MOHAWK

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Based on the above, and Geomatrix's evaluation of the GM Site Investigation Report, this further confirms that the "secondary source" at the former GM Saginaw Site migrated from the known PCB source area located in the vicinity of the former GM wastewater treatment plant.

Once you have completed your review of this report, NMPC would like to set up a meeting with the Department to discuss the report and its conclusions in greater detail.

If you have any questions, or need further information, please feel free to contact me at (315) 428-6624 or James F. Morgan at (315) 428-3101.

Thank you in advance for your cooperation in this matter.

Very truly yours,

Michael W. Sherman
Manager, Site Investigation &
Remediation Program

RRC:cg
cc: Peter Beuchi
Jaspal Walia
James F. Morgan

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Evaluation of the Former GM – Saginaw Facility Investigations

Prepared for:

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Project B4295
December 22, 1997

Geomatrix Consultants

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EVALUATION OF THE FORMER GM-SAGINAW FACILITY INVESTIGATIONS

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EXECUTIVE SUMMARY

The purpose of this assessment of the Former GM-Saginaw Facility Investigations is to present Geomatrix's evaluation of the Site Investigation Report prepared by EMCON for General Motors dated October 1995, revised January 1997 (SI Report) and documents and data provided to Niagara Mohawk Power Corporation (NMPC) as the data relates to an alleged "secondary source" of PCB contamination at the GM Facility.

Based on the information presented in documents and data evaluated by Geomatrix, data do not exist to support the conclusions presented in the SI Report. Specifically, it can not be concluded that PCB contamination in the southern portion of the GM Facility migrated from a second PCB source area located east of the GM Facility. Rationale for this interpretation is summarized below:

- EMCON failed to fully assess the storm sewer system as a migration pathway to transport PCBs to the southern portion of the facility. PCBs were detected in storm sewer water and sediment samples in both the vicinity of the known source area and in the southern portion of the site. The storm sewer lateral located near the known PCB source area occurs in the vicinity of PCB-contaminated oily soils. Because the sewer laterals and storm sewer pipes are surrounded by permeable backfill material, the storm sewer system can act as a preferential pathway for contaminant migration in the direction of storm water drainage (to the south). A detailed investigation that included the inspection and analysis of sewer backfill materials, catch basin sediments, and storm sewer lateral backfill material should have been performed to characterize this potential contaminant migration pathway. The limited sampling of two manholes along the storm sewer system (that did identify the presence of PCBs) was not adequate to fully investigate the sewer system as a potential primary PCB migration pathway at the GM Facility. Since the original clay tile pipe (the source area of PCB contamination) was accidentally discovered, a survey to locate other subsurface drainage systems should be performed.

- The report erroneously describes the direction of groundwater flow in the former Scajaquada Creek channel from the east to the west. EMCON's data show that a hydraulic gradient exists from the west (from the GM Facility) to the east, toward the NMPC property. Surface water flow in the former channel historically flowed from the east to the west. However, during the late 1920's and early 1930's, the creek was re-routed and the channel was filled. Since the Kensington Terminal was constructed during the 1950's, the NMPC property did not contribute runoff to the Scajaquada Creek channel.

- PCB isomer identification is problematic. The SI Report utilizes the identification of specific aroclor isomers (Aroclors 1248 and 1260) in groundwater analyzed from the source area (in the vicinity of the WWTP) to differentiate PCBs detected in the southern portion of the GM Facility (Aroclor 1242). However, the presence of other organic contamination in the soils and groundwater caused matrix interferences during laboratory analysis of the samples, thereby making it difficult for a laboratory to differentiate between the isomers

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detected at the facility. This was documented in EMCON's data validation report but was not considered in EMCON's evaluation of an alternate source area. Additionally, different laboratories utilized for analytical services tentatively identified both Aroclor 1242 and 1248 in the known source area and in the area in the vicinity of the former Scajaquada Creek channel. The use of a single laboratory for all laboratory analytical at the GM Facility would have maximized laboratory interpretation consistency for each investigation performed at the facility ensuring a higher degree of quality assurance/quality control (QA/QC).

- The use of congener analytical results are inconclusive. A positive identification of mixtures was often not made by the laboratory performing the congener analysis. The examination of the chromatograms indicated significant interference at key peak positions necessary to establish mixture identifications. As a result, congener identification is not conclusive for samples collected at the GM Facility during the site investigation.

As a result of the data deficiencies identified during this evaluation, the identification of a second source of PCBs at the GM Facility is not supported by the data provided to NMPC. It is also determined that a detailed investigation of the storm sewer system (i.e., the main storm sewer, sewer laterals, bedding materials, and catch basins) and other subsurface conduits was not performed. The storm sewer system represents a potential primary transport mechanism for the migration of PCBs to the southern portion of the GM Facility.

1.0 INTRODUCTION

The New York State Department of Environmental Conservation (NYSDEC) submitted a letter dated May 14, 1997 to the Niagara Mohawk Power Corporation (NMPC) (see Attachment A) suggesting that the NMPC-owned property located adjacent to the Former GM Saginaw Facility (herein referred to as the 'Facility') may be a source of PCB contamination identified near the eastern fence line of the Former GM property at Parking Lot #4. Identification of PCBs in this portion of the former GM facility occurred during additional site investigations of the GM facility related to an investigation of a spill(s) of reclaimed industrial oil containing high concentrations of PCBs at the Facility's wastewater treatment plant (WWTP). GM executed a Consent Order with the NYSDEC on January12, 1995 to:

- implement Interim Remedial Measures (IRM) to remove a clay tile sewer pipe which was the suspected source of PCB contamination;
- determine the extent of PCB and lead contamination in the area of Parking Lot #4;
- identify remedial alternatives for each Operable Unit (OU-1 – PCB Contamination; and OU-2 – Lead Contamination); and
- implement a remedial alternative for OU-1 selected by the NYSDEC.

Previous investigations at the facility conducted by EMCON for General Motors (GM) detected PCBs in free-phase oil, soil and groundwater in the vicinity of the WWTP and elevated levels of lead in on-site granular ash-like fill.

The Site Investigation Report prepared by EMCON for General Motors dated October 1995 and revised January 1997 (herein referred to as the SI Report) implies that PCBs detected in soil and water samples collected from borings/wells installed in the southern portion of the former GM Facility (adjacent to the NMPC property) is from a second source of PCB contamination. The SI Report states on Page 4-4 that, "Based on the current and historic results, it appears that two source areas exist. PCB contamination in the groundwater attributable to the original clay tile pipe and IRM excavation (the confirmed Facility source area) ... The second source area is believed to be located off-site, to the east of the GM property."

2.0 PURPOSE

Subsequent to receiving the NYSDEC letter dated May 14, 1997, a meeting scheduled for early August 1997 was re-scheduled to September 10, 1997 at which NMPC, NMPC legal representation and Geomatrix Consultants, Inc. (Geomatrix) identified data gaps and presented alternative data interpretations to the information presented in the Site Investigation Report to Jaspal Walia of the NYSDEC, Mark Napolitan of GM, and ECMON (Wehran) - consultants for GM. At the meeting, Geomatrix reported that:

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- Errors existed in the SI Report regarding the interpretation of site characterization data (i.e., direction of groundwater flow in the vicinity of the former Scajaquada Creek channel, the identification of specific aroclor isomers in the source area and the area in the vicinity of the former Scajaquada Creek channel); and

- The storm sewer system had not been properly investigated as a potential preferential pathway for PCB migration.

At the conclusion of the meeting, EMCON and GM stated that NMPC/Geomatrix had not reviewed all data necessary to substantiate EMCON's data interpretations and that these data would be provided to NMPC for review.

It was agreed at the meeting that the additional data were to be provided to Geomatrix by EMCON within five days of the September meeting. EMCON provided the supplemental data reports to the NYSDEC during the week of October 6, 1997. Geomatrix reviewed these data and have prepared this evaluation of the investigations conducted at the GM Facility.

Documents Reviewed

In addition to Volumes I and II of the Site Investigation Report for the Former GM – Saginaw Buffalo Facility NYSDEC Site No. 915152 dated October, 1995 (revised January 1997), Geomatrix reviewed the documents EMCON provided to the NYSDEC in October 1997. The complete list of documents is provided in Attachment 2. It should be noted that all of the documents provided to the NYSDEC and reviewed by Geomatrix are dated 1990 and later, even though the reports indicate that some investigations in the source area were completed in the late 1980s.

3.0 DATA DEFICIENCIES

Summarized below are data gaps identified in the investigations of the GM Facility. Presumptions used by EMCON to conclude a secondary PCB source are also presented. These data gaps and presumptions are referred to as data deficiencies in this assessment of investigation data reported for the GM Facility. The data deficiencies are discussed since they contradict or show lack of evidence to support EMCON's interpretations of site investigation data.

DATA DEFICIENCY #1

Detailed investigation of the storm sewer system (i.e., storm sewer pipes, bedding materials surrounding the pipes, laterals, and catch basins) was not conducted at the GM Facility. Additionally, the search for other buried conduits, such as the original clay tile pipe (accidentally discovered in the source area), was not documented in the reports. As a result, potential primary pathways for the migration of PCBs were not fully assessed.

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DATA DEFICIENCY #2
PCB concentrations at MW-206 are greater than concentrations at MW-203, and that groundwater flow through the former Scajaquada channel is from the east to the west (from MW-206 toward MW-203). EMCON infers that PCBs migrate from the east to the west.

DATA DEFICIENCY #3
PCB Aroclors 1248 and 1260 were detected in the source area in the vicinity of the clay tile pipe and Aroclor 1242 was detected in wells MW-203 and MW-206 located south and southeast of the source area. EMCON attempts to use individual aroclor isomers to identify discrete sources of PCB contamination.

DATA DEFICIENCY #4
PCB congener analysis of water in wells MW-203 and MW-206 identified the same chromatographic profile as was evidenced in the soil sample from MW-206, but not in sample BL-96-8 collected from the source area. EMCON uses congener information to differentiate PCB mixtures in one sample collected from the known source area and two samples collected from the southern portion of the GM Facility to support their interpretation.

A site map is presented as Figure 1 for reference purposes.

4.0 PHYSICAL SETTING

Prior to addressing each of the data deficiencies presented above, a description of the physical site features and geologic and hydrogeologic conditions are presented below. Information used to describe the physical setting was provided by data presented in the site investigation reports prepared by EMCON.

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4.1 Site Geology

The general stratigraphy of the Facility is characterized below in descending order:

Avg. Depth and Range (ft)	Description	Permeability (cm/sec)
1 (0 - 1)	Asphalt	N/A
5 (2 - 10)	Fill (coal, slag, ash, etc.); the water table occurs in fill	2.3×10^{-3}
1 (1 -2)	Topsoil (former surface soil horizon)	N/A
5 (5 - 8)	Former Scajaquada Creek Channel	1.9×10^{-2}
8* (4 - 11*)	Silty Clay	No Data, 1×10^{-7}*
To Depth	Limestone	2×10^{-2}

* = estimated value due to lack of data

These stratigraphic units are presented in cross-section using the same section lines drawn by EMCON (Drawings 4 and 5 of the Site Investigation Report) on Figures 2 and 3. However, several corrections to the EMCON-prepared cross-sections were necessary to match monitoring well construction diagrams (i.e. well screen positions) and location of geologic contacts to depths reported in the borehole logs. An additional cross-section was prepared using EMCON data along section line C-C', oriented with the general direction of groundwater flow (see Figure 4). Since storm sewer depths are not presented in the EMCON report, sewers are not shown on the cross-sections. The cross-section in Figure 4 shows a clay confining unit sloping from the source area to the southeast toward the southwest corner of NMPC property.

4.2 Site Hydrogeology

Cross-sectional groundwater flow modeling is presented in Figure 5 along section line C-C' (from the source area to the southeast in the direction of NMPC property). The cross-sectional flow model presents groundwater flow directions and time of travel estimates in saturated soil and bedrock. As shown in Figure 5, groundwater flow velocities (approximately 50 to 60 ft/yr) are moderate through the fill in the direction of the Niagara Mohawk Property. Groundwater from the PCB source area could have reached the vicinity of the Niagara Mohawk property in less than 10 years. Spillage of PCBs occurred during the early 1970's (EMCON Site Investigation Report, 1997), more than 25 years ago.

Features that can affect the migration of PCB contamination from the known source area include: the former channel of Scajaquada Creek; the storm sewer system; and the groundwater collection trench located in the vicinity of PCB source area at the WWTP (see Figure 6). A map of the water table is shown on Figure 7 with the general direction of groundwater flow occurring to the south-southeast from the source area.

Because of the granular sediments/fill used to backfill the former Scajaquada Creek channel having a higher hydraulic conductivity than the surrounding soils, the former channel acts as a preferential pathway for groundwater flow. The storm sewer lines do not significantly affect year-round groundwater flow in the vicinity of source area (manhole MH-1) since dry weather sampling identified no flow in the sewer. However, due to a relatively shallow water table, during wet weather conditions, the water table likely rises to, or above, the invert elevation of the sewer. A small amount of flow was identified in MH-2 during the dry weather sampling event indicating minor groundwater discharge to the storm sewer in the southern portion of the Facility. No wet weather sampling was conducted or reported according to the documents provided. The groundwater collection trench does not significantly impact groundwater elevations in nearby wells (i.e., MW-200; MW-205), therefore its impact is likely minimal.

4.3 Distribution of Oil

The distribution of oil-stained soil samples collected from soil borings in the vicinity of the source area is shown in Figures 6 and 7. The extent of oil shown on the figures was established by Geomatrix from a review of borehole logs indicating the presence of oil-laden soil or sheens present in split spoon soil samples. Analytical test results of these oily soils indicate that PCBs are constituents present in the free-phase oil and can potentially migrate with the movement of oil and groundwater. Laboratory analysis identified Aroclor 1242, 1248, and 1260 in soil and groundwater samples collected from the source area. As shown in the figures, oily soils were not present in the vicinity of MH-1. This was confirmed by excavation and repair of a portion of the sewer lateral in 1995 which extended 5 to 10 feet to the east of MH-1. However, borings located east of MH-1 in the vicinity of the sewer lateral (i.e., BL-12) identified the presence of oily soils. Oily soils in this area indicate a strong potential for sewer bedding contamination east of MH-1; beyond the area of sewer lateral repair. Investigation of sewer bedding beyond the sewer lateral repair was not documented in the Site Investigation Report or reports provided to the NYSDEC for NMPC review. Sewer bedding materials often act as migratory pathways for contamination from source areas.

5.0 DISCUSSION OF DATA DEFICIENCY #1

A detailed investigation of the storm sewer system was not reported at the GM Facility. Only limited sampling of water and sediment in two manholes and limited excavation and inspection of soil and backfill materials in the immediate vicinity of manhole MH-1 was performed.

Data Deficiency #1 Discussion

Subsurface utilities are often a preferential pathway for contaminant migration due to the presence of granular backfill materials that surround the buried conduit. Because of their ability to transport contamination great distances from a source area, detailed underground utility investigations are routinely performed where contaminant migration in or around buried utilities is possible. Smoke testing or dye testing is often performed to locate and map the

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distribution of a sewer pipe system. Testpit excavation is typically conducted at several locations along the underground utility to inspect and sample bedding materials as pathways for contaminant migration. Sampling of water in storm sewers is usually performed during dry and wet weather events at various times during the year to establish whether seasonal groundwater fluctuations affect contaminant transport in the vicinity of the sewer system. Often piezometers are installed in bedding materials adjacent to utilities and water level data collected and compared to water levels in wells installed in the shallow water-bearing zone to establish the influence the underground utility has on groundwater flow.

With the exception of excavation and repair of a portion of the storm sewer lateral that extended 5 to 10 feet to the east of MH-1 and limited sediment and water sampling at manholes MH-1 and MH-2, detailed investigations were not performed at the GM Facility. Additionally, the clay tile pipe that was removed during the IRM excavation, a known source of PCB-contaminated oils, was accidentally discovered during on-site investigations. It is not known if other clay pipes exist below the ground surface and act as migration pathways for contamination. An investigation for other buried conduits was not reported for the GM Facility.

Since backfill material occurs adjacent to the sewer pipe and PCB-contaminated oils were identified in the vicinity of the pipe during the 1993 boring program, PCB transport to the south via this preferential pathway should be investigated.

6.0 DISCUSSION OF DATA DEFICIENCY #2

The EMCON Site Investigation Report states on Page 4-4 that,

> "The second source area is believed to be located off-site, to the east of the GM property. This is supported by the fact that PCB concentrations at MW-206 are on the order of 10 times greater than concentrations at MW-203, and that groundwater flow through the former channel (Scajaquada Creek) is from the east to the west (from MW-206 toward MW-203) as supported by the hydrogeologic data".

Data Deficiency #2 Evaluation

Historic flow of surface water through the former Scajaquada Creek channel was from the east to the west. As described in the facility history in Appendix A of the SI Report, the Scajaquada Creek was in-filled during the late 1920s and early 1930s. Since the Kensington Terminal was not constructed until the 1950s (NMPC files, documents, and drawings), the NMPC substation property did not contribute to surface water runoff to the Scajaquada Creek channel.

According to groundwater elevations measured in wells installed in the former channel (MW-203, MW-206, and MW-207), groundwater elevations are higher in the west and lower in the east (see Figure 7). As a result, a shallow hydraulic gradient exists in an easterly direction (from the west [upgradient direction] to the east [downgradient direction]). This gradient

allows groundwater and any associated contamination to migrate through the preferential pathway via the in-filled channel towards the NMPC property. This finding is contrary to the erroneous direction of flow stated in the SI Report. Since the permeable fill of the channel can act as a preferential pathway for the migration of contamination, contaminant transport along the sewer lateral bedding materials can occur which enhances migration of contamination to the east.

7.0 DISCUSSION OF DATA DEFICIENCY #3

The EMCON Site Investigation Report states on Page 4-4 that,

> "The groundwater contamination, present as PCB Aroclors 1248 and 1260, is localized within the boundaries of the groundwater collection trench.
>
> The second source area affects groundwater present in the former Scajaquada Creek channel as shown by data collected from wells MW-203 and MW-206. It is worthwhile to note that while Aroclor 1242 was detected in MW-203, its presence is unrelated to the Aroclor 1242 detected in TB-4, TB-5 and TB-6 (source area borings). In other words, a southerly migration of PCB contamination from this area is not possible. ....Only Aroclors 1248 and 1260 have been detected in the (source area). There have been no detections of Aroclor 1242 in this area during the SI."

Data Deficiency #3 Evaluation

Although the SI Report states that only Aroclors 1248 and 1260 were detected in groundwater in the source area (in the vicinity of the WWTP), the report states on Table 4-4 that Aroclor 1242 was detected during previous investigations in groundwater collected from TB-4, TB-5 and TB-6 at concentrations ranging from 35.9 ug/l (TB-6) to TB-4 1190 ug/l (TB-4) in the source area. Additionally, Table 4-2 indicates that Aroclor 1242 was identified in four soil samples (TB-93-1 through TB-93-4) collected from below the water table at concentrations ranging from 150 (TB-93-2) to 260 mg/kg (TB-93-1). The table also identifies Aroclor 1242 in a sample collected from an unknown depth (TP-19). These detections of Aroclor 1242 are all located in the vicinity of the WWTP.

Differentiating aroclor isomers can be used to identify discrete sources of PCB contamination. This method of source identification is conclusive if PCBs are the primary organic contaminants and interfering-type organic compounds are not present in the soil or water samples.

Interfering-type organic compounds were identified during analysis of samples collected from the GM site. The EMCON laboratory data validator review comments presented in the appendix to the SI Report indicate that, in numerous samples, the identification of specific PCB aroclors could not be assured or was qualified as tentatively identified. For example, a letter

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from data validator (Data Validation Services) dated November 29, 1996 to Wehran EMCON regarding the data validation report for SDG EMC12, EMC13, EMC14, and EMC15 states that,

"The reported identifications of Aroclor 1242/1248 in samples MW-203 and MW-206-S4 should be considered tentative, due to matrix interference prohibiting conclusive identification".

Additional data validation comments are summarized in Attachment 3. The data validator comments regarding the problematic analytical data interpretations were not discussed in the SI Report. The cause of the tentative or qualified identification is co-eluting peaks on the GC chromatograms. This often occurs when chlorinated aromatic hydrocarbons (i.e., naphthalene compounds, chlorobenzenes) co-exist in samples and co-elute on the GC chromatograms with peaks corresponding to the identification of Aroclor 1242 and 1248. In other words, interference is caused by the presence of other organic compounds that co-exist with PCB contamination. As a result, it is difficult to establish the difference between Aroclor 1242 and 1248 in samples collected at the GM Facility. Both Aroclor 1242 and 1248 were detected in the PCB source area and the identification of Aroclor 1242 in samples collected from the channel was tentative and could easily have been interpreted as Aroclor 1248.

When interfering organic contaminants are present in PCB samples, the interpretation of which aroclor is present in a sample is a subjective decision made by the laboratory chemist analyzing the samples. The problem of aroclor identification becomes compounded when different laboratories are used to analyze samples. What one laboratory would consider Aroclor 1248, another could identify as Aroclor 1242 if interferences are present. This may have been the case with PCB samples analyzed by RECRA Analytical in 1993. Their analyses identified the presence of Aroclor 1242 in four samples collected from the source area. RECRA Analytical is a reputable laboratory often utilized by the NYSDEC. Samples analyzed during the Site Investigation in 1995 and 1996 were analyzed by Upstate Analytical Laboratories, Inc. Upstate interpreted the aroclor as Aroclor 1248. As a result, conflicting PCB isomer compounds were identified in the source area. Because of rigid quality assurance/quality control (QA/QC) procedures that must be employed during site investigations, a single NYSDEC-approved laboratory is generally utilized throughout an investigation to maintain data consistency and minimize data interpretation problems.

Because of the matrix interferences and the use of multiple laboratories, PCB analytical data is considered questionable and inconclusive.

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8.0 DISCUSSION OF DATA DEFICIENCY #4

The EMCON Site Investigation Report states on Page 4-4 that,

> "Additionally, congener-specific PCB analysis of the groundwater samples from the wells in the former channel showed the same chromatographic profile as was evidenced in the soil sample from MW-206, but not in a PCB-contaminated soil sample collected from the IRM excavation area (BL-96-8)."

Data Deficiency #4 Discussion

An experienced analytical chemist reviewed the chromatograms of BL-96-8 and MW-203 and MW-206 for Geomatrix. It was concluded that PCB congener analysis could not be used to definitively identify individual PCB mixtures in the samples analyzed by Northeast Analytical. As stated above in the discussion of Data Deficiency #3, significant interference exists on the chromatograms caused by the existence of other organic contaminants present in the soil and groundwater samples. The laboratory often qualified their results as tentative and indicated interference with many non-PCB peaks. As a result, a positive identification of mixtures was often not made by the laboratory (Northeast Analytical) performing the congener analysis.

A summary of the congener analyses is presented in Attachment 4. The weight percentages of the various homologs identified are similar for each of the samples analyzed. As shown in Attachment 4, the tri- and tetra- homologs are the dominant weight percentage of homologs identified in all of the samples tested indicating a similar percentage of chlorine atoms per molecule that produce the aroclor isomers. The examination of the chromatograms indicated significant interference at key peak positions necessary to establish mixture identifications. As a result, congener identification is not conclusive for samples collected at the GM Facility during the site investigation.

9.0 GENERAL DISCUSSION

Based on a review of the information provided to Geomatrix, EMCON should have performed a detailed investigation of the storm sewer system (i.e., the main storm sewer, sewer laterals, bedding materials, and catch basins) as a preferential migratory pathway for PCBs (see page 4-5 of the EMCON Site Investigation Report). The sewers were reportedly constructed in the early to mid 1960s and spills of reclaimed industrial oils containing high concentration of PCBs occurred during the 1970s (EMCON Site Investigation Report).

Investigations at the GM Facility have detected PCBs in water and sediment samples collected from the sewer. Recent cleaning of the sewers resulted in the disposal of PCB-contaminated sediment as hazardous waste. Therefore, historically, the sewers have been a migration pathway for PCBs. Flow in the sewer is to the south, away from the PCB source area and towards the permeable fill of the former Scajaquada Creek channel.

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No data exist in reports presented to NMPC (as part of this review) that describes any detailed investigation of the sewer bedding along the storm sewer. The only documented investigation of the sewer bedding materials was presented in Section 2.0 of the SI Report that described limited soil excavation to repair a short length of sewer lateral (5 to 10 feet in length) located in the immediate vicinity of manhole MH-1 (see Figure 6).

PCB contaminated oily soils are present, or have historically occurred, in soils adjacent to the permeable backfill material of the storm sewer system. The PCB contaminated oils/groundwater could have infiltrated the storm sewer during wet weather events and migrated into the backfill material. Transport of the PCB contaminated oil, sediments and water occurred in a southward direction. PCB transport through the storm sewer system was documented during the EMCON Site Investigation by detecting PCBs in water and sediments in both manholes (see Figure 7 for the location of MH-1 and MH-2). As the sewer passes through the in-filled channel of Scajaquada Creek, PCB contaminant transport may have occurred in an east – west direction through the bedding materials of the storm sewer laterals and/or the permeable fill/sediments present in the channel.

If PCB congener analysis is to be utilized during additional investigations at the GM Facility, filtering of co-eluting peaks caused by other organic contamination in the samples may be possible to identify PCB mixtures. A suite of samples collected from PCB-contaminated oily soils in the source area, the bedding materials of several storm sewer laterals, catch basins, the main storm sewer, and sediments in the former Scajaquada Creek channel should be performed to better characterize the storm sewer system as a transport pathway for the migration of PCBs from the known source area to the southern portion of the GM Facility. Also, the identification of other organic contamination in the source area that co-exists with PCB contamination could be used to identify whether the same organic constituents are associated with the PCBs detected at the GM Facility.

10.0 SUMMARY

This document addresses specific data deficiencies related to the EMCON/GM interpretation of site characterization data at the former GM Facility. The interpretation of a secondary source area located to the east of the GM facility is not justified based on the data deficiencies discussed in this document.

Using EMCON's data, we have demonstrated that groundwater flow is to the south from the PCB source area toward the former Scajaquada Creek channel and that a shallow hydraulic gradient exists from the west to the east. This is contrary to the erroneous east to west interpretation presented in the SI Report.

Regarding the detection of PCB Aroclor 1248 and 1260 in the known source area and Aroclor 1242 in the former Scajaquada Creek channel. EMCON states that " there have been no detections of Aroclor 1242 in this area (the source area)". However, Aroclor 1242 has been

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detected in the source area in both the groundwater and soil during previous investigations. Water samples collected and analyzed from TB-4, TB-5, and TB-6 and soil samples TB-93-1 through TB-93-4 and soil sample TP-19 detected relatively high concentrations of Aroclor 1242. Each of these samples was collected from the source area in the vicinity of the WWTP. Therefore, Aroclor 1242 has been identified in the known source area and the area in the vicinity of the former Scajaquada Creek channel located in the southern portion of the site.

The conclusive identification of specific PCB aroclors is often difficult due to other organic contaminant interferences (matrix interference) and weathering of the PCB compounds as they are exposed to the environment for a length of time. Since the PCBs in the known source area have been in the environment for more than 20 years and the probable co-existence of chlorinated aromatic hydrocarbons in soil and groundwater samples cause matrix interference, the positive identification of aroclors is difficult at the GM Facility. Samples collected from the known source area and analyzed by RECRA Analytical identified Aroclor 1242 in the source area soils. However, source area soils analyzed by Upstate Laboratories identified Aroclor 1248. Therefore, conclusive identification of PCB aroclor isomers or congeners at the GM Facility may not feasible with standard analytical methods.

The investigation at the GM Facility should focus on the storm sewer system as the primary route of PCB transport. The existing information indicates that a portion of wet weather flow in the sewer originates in the vicinity of the known PCB source area and flows south toward the former Scajaquada Creek channel. Once in the channel, PCBs can migrate in an east and west direction through permeable fill/sediments in the in-filled channel and/or the bedding material of the storm sewer laterals. Data collected by EMCON indicates that PCB migration has occurred in the sewer and that the investigation was primarily limited to the source area and water and sediment in manholes MH-1 and MH-2. Detailed investigation of the storm sewer system including bedding material adjacent to the storm sewer and catch basins was not documented in the reports reviewed.

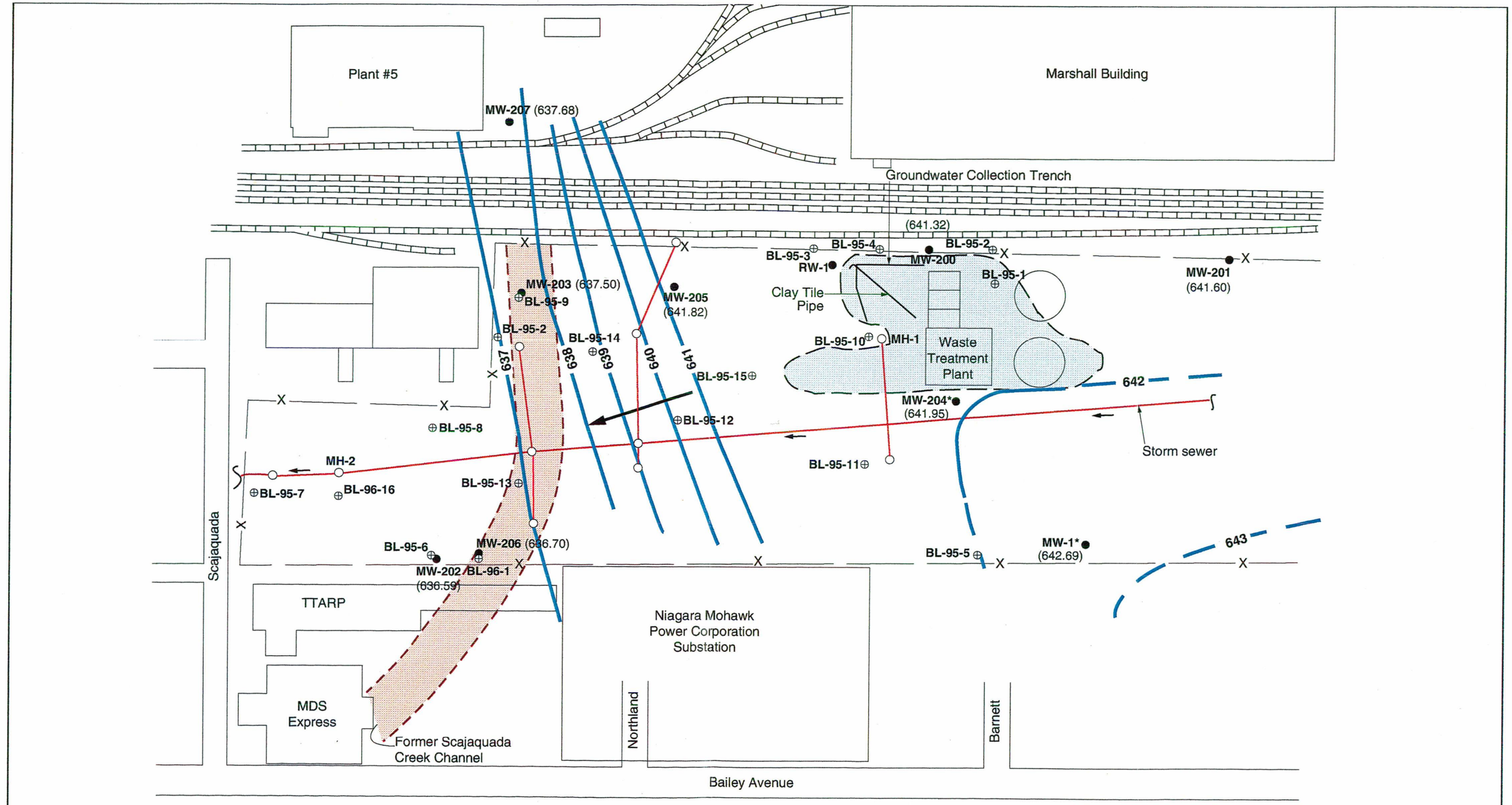
Based on the information presented in documents and data evaluated by Geomatrix, data deficiencies exist which do not support the conclusions presented in the SI Report. Based on an evaluation of data provided to NMPC, it can be concluded that PCB contamination in the southern portion of the GM Facility migrated from the known PCB source area located in the vicinity of the GM WWTP.

Respectfully submitted,
GEOMATRIX CONSULTANTS, INC.

John Luttinger for

David D. Slaine, P.G., CGWP
Principal Hydrogeologist

Richard H. Frappa, CPG
Senior Hydrogeologist



EXPLANATION

0 100 feet

Approximate Scale

- ● **MW-205** Monitoring well location (*denotes approximate well location)
- ⊕ **BL-95-14** Boring location
- Approximate visual extent of oil (from 1993 Lead Sampling Project Oil Containment Area)
- **638** Shallow groundwater potentiometric surface contour (10/25/96)
- Groundwater flow direction

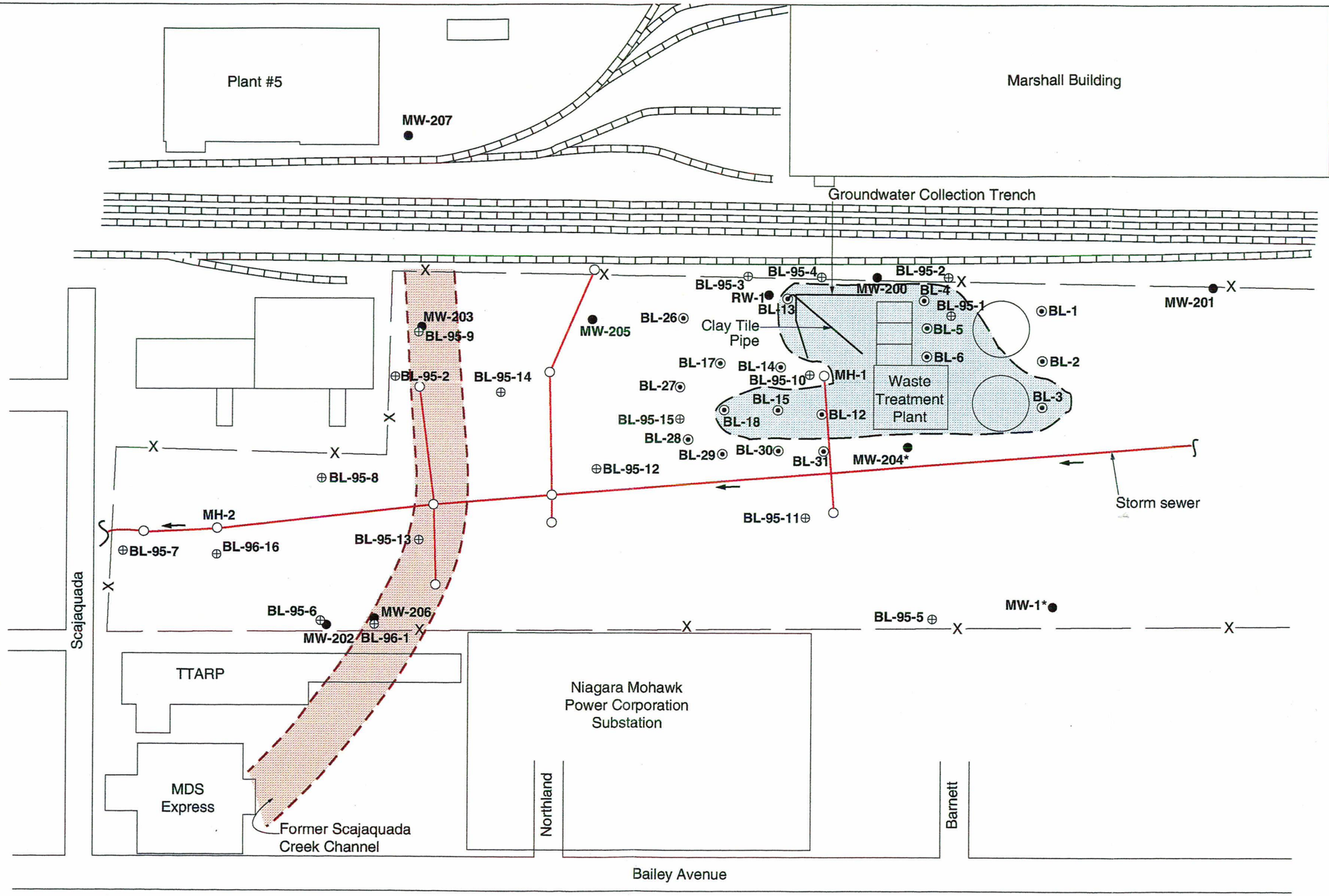
Reference: Wehran-New York, Inc., Site Investigation Report, Former GM-Saginaw Buffalo Facility, NYSDEC Site No. 915152, Drawing No. 3, 1997.

SHALLOW GROUNDWATER FLOW
Niagara Mohawk Power Corporation
Former GM-Saginaw Buffalo Facility

GEOMATRIX

Project No.	Figure
B4295	7

B4295.006.ai



Explanation

- ● **MW-205** Monitoring well location (*denotes approximate well location)
- ⊕ **BL-95-14** Boring location
- ⊙ **BL-29** Approximate 1993 Boring location
- Approximate visual extent of oil (from 1993 Lead Sampling Project Oil Containment Area)

Reference: Wehran-New York, Inc., Site Investigation Report, Former GM-Saginaw Buffalo Facility, NYSDEC Site No. 915152, Drawing No. 3, 1997.

0 100 feet

Approximate Scale

DISTRIBUTION OF OIL
Niagara Mohawk Power Corporation
Former GM-Saginaw Buffalo Facility

GEOMATRIX

Project No.	Figure
B4295	6

B4295.002.ai

C
Southeast

C'
Northwest

650
645
640
635
630
625
620
615

ELEVATION, feet

TTARP
Fence line

MW-206
BL-95-13
BL-95-14
MW-205
RW-1
BL-95-4
MW-200

636.7
641.82
641.32
625.07

Explanation

- Asphalt and bedding
- Fill (coal, slag, glass, ash, cinders, metal, and wood)
- Organic silt/topsoil
- Clay
- Limestone
- Groundwater flow path, distance between arrows represents one year travel time
- 641.87 Water table elevation (10/25/96)
- 625.07 Bedrock groundwater elevation (10/25/96)
- Inferred contact

0 — 60 feet
0 — 5 feet
Approximate Scale
12 Times
Vertical
Exaggeration

Reference: Wehran-New York, Inc., Site Investigation Report, Former GM-Saginaw Buffalo Facility, NYSDEC Site No. 915152, 1997.

GROUNDWATER FLOW MODELED
ALONG CROSS SECTION C-C'
Niagara Mohawk Power Corporation
Former GM-Saginaw Buffalo Facility
Cross Section Evaluation

GEOMATRIX

Project No.	Figure
B4295	5

B4295.005.ai

C
Southeast

C'
Northwest

650
645
640
635
630
625
620
615

ELEVATION, feet

TTARP
Fence line

MW-206
BL-95-13
BL-95-14
MW-205
RW-1
BL-95-4
MW-200

636.7
641.82
641.32
625.07

Explanation

- Asphalt and bedding
- Fill (coal, slag, glass, ash, cinders, metal, and wood)
- Organic silt/topsoil
- Clay
- Limestone

- ▼ 641.87 — Water table elevation (10/25/96)
- ▽ 625.07 — Bedrock groundwater elevation (10/25/96)
- — — Inferred contact

0 — 60 feet
0 — 5 feet
Approximate Scale
12 Times
Vertical
Exaggeration

Reference: Wehran-New York, Inc., Site Investigation Report, Former GM-Saginaw Buffalo Facility, NYSDEC Site No. 915152, 1997.

CROSS SECTION C-C'
Niagara Mohawk Power Corporation
Former GM-Saginaw Buffalo Facility
Cross Section Evaluation

GEOMATRIX

Project No.	Figure
B4295	4

B4295.001.ai

B
Southwest

B'
Northeast

650
645
640
635
630
625
620
615

ELEVATION, feet

RW-1
MW-204
MW-1

641.95
642.69
625.07

Explanation

- Asphalt and bedding
- Fill (coal, slag, glass, ash, cinders, metal, and wood)
- Organic silt/topsoil
- Clay
- Limestone

641.95 Water table elevation (10/25/96)

625.07 Bedrock groundwater elevation (10/25/96)

Inferred contact

0 — 60 feet
0 — 5 feet
Approximate Scale
12 Times
Vertical
Exaggeration

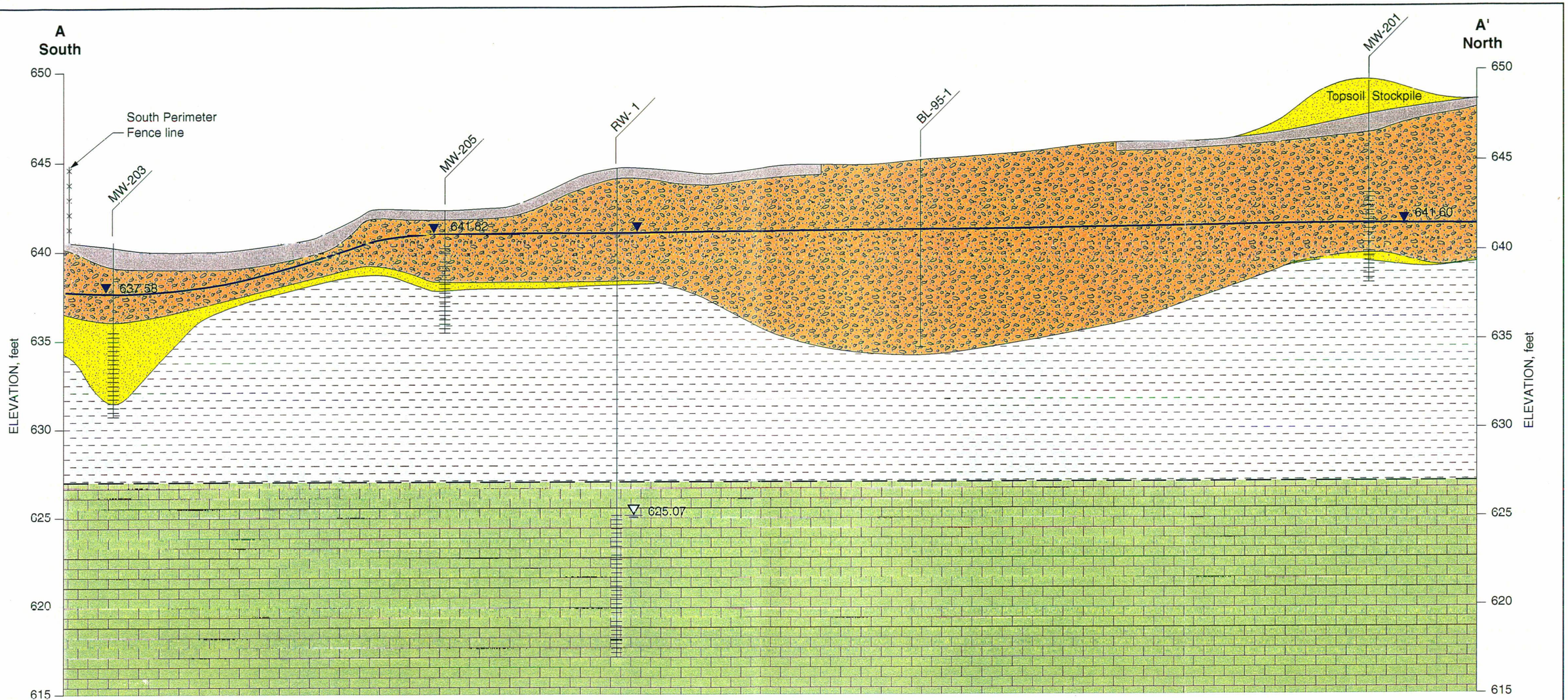
Reference: Wehran-New York, Inc., Site Investigation Report, Former GM-Saginaw Buffalo Facility, NYSDEC Site No. 915152, Drawing No. 5, 1997.

CROSS SECTION B-B
Niagara Mohawk Power Corporation
Former GM-Saginaw Buffalo Facility
Cross Section Evaluation

GEOMATRIX

Project No.	Figure
B4295	3

B4295.004.ai



Explanation

- Asphalt and bedding
- Fill (coal, slag, glass, ash, cinders, metal, and wood)
- Organic silt/topsoil
- Clay
- Limestone
- 641.82 — Water table elevation (10/25/96)
- 625.07 — Bedrock groundwater elevation (10/25/96)
- Inferred contact

0 — 60 feet

0

5 feet

Approximate Scale
12 Times
Vertical
Exaggeration

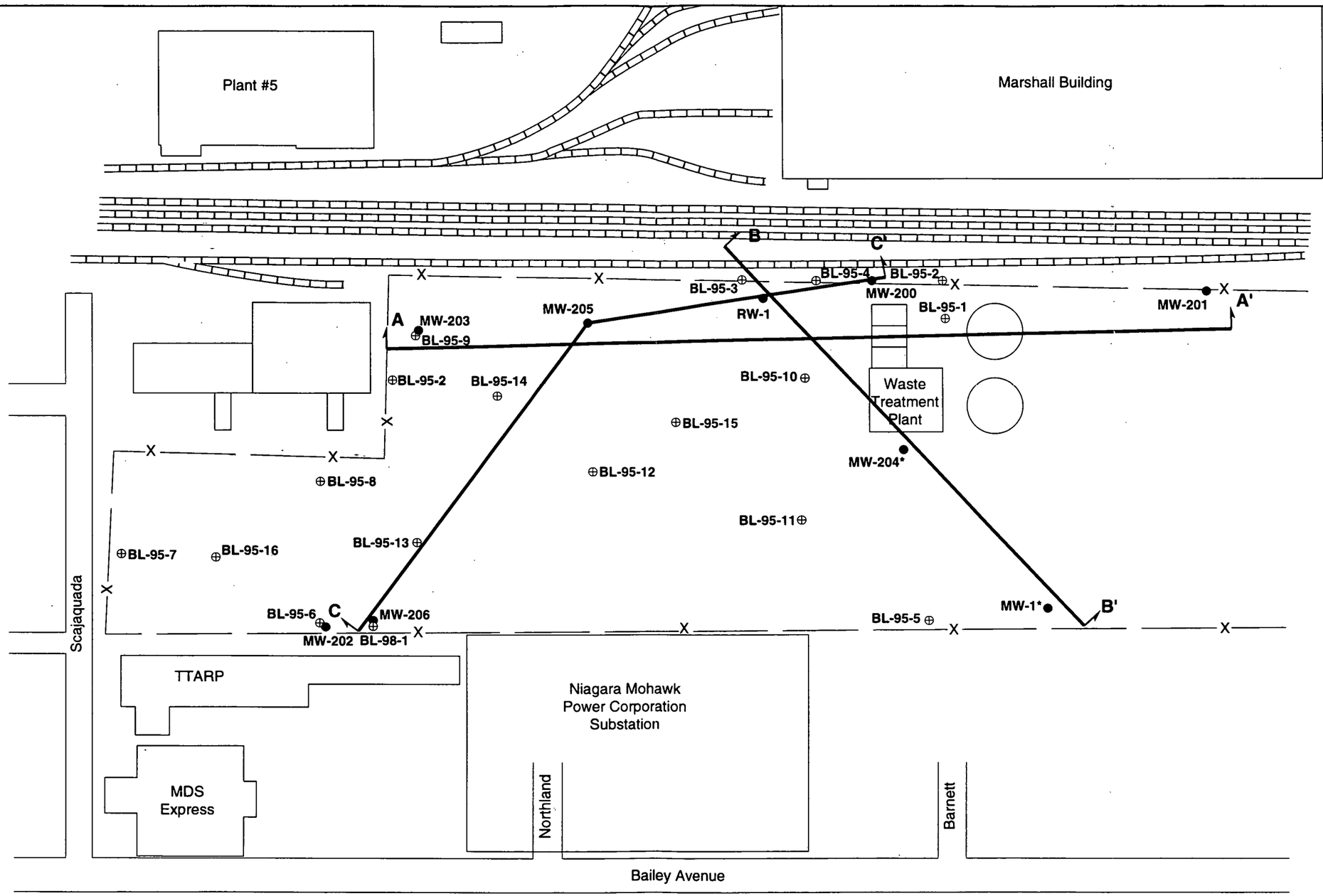
Reference: Wehran-New York, Inc., Site Investigation Report, Former GM-Saginaw Buffalo Facility, NYSDEC Site No. 915152, Drawing No. 4, 1997.

CROSS SECTION A-A'
Niagara Mohawk Power Corporation
Former GM-Saginaw Buffalo Facility
Cross Section Evaluation

GEOMATRIX

Project No.	Figure
B4295	2

B4295.003.ai



Explanation

● **MW-205** Monitoring well location (*denotes approximate well location)

⊕ **BL-95-14** Boring location

0 100 feet

Approximate Scale

Reference: Wehran-New York, Inc., Site Investigation Report, Former GM-Saginaw Buffalo Facility, NYSDEC Site No. 915152, Drawing No. 3, 1997.

SITE MAP
Niagara Mohawk Power Corporation
Former GM-Saginaw Buffalo Facility
Cross Section Evaluation

GEOMATRIX

Project No.	Figure
B4295	1

B4295.002.ai

GEOMATRIX

ATTACHMENT 1

NYSDEC LETTER TO NIAGARA MOHAWK POWER CORPORATION DATED MAY 14, 1997

New York State Department of Environmental Conservation
270 Michigan Avenue, Buffalo, New York 14203-2999
(716) 851-7220

John P. Cahill
Acting Commissioner

Post-it™ brand fax transmittal memo 7671	# of pages ▸
To JIM MORGAN	From L J. Fiume
Co. NMPC	Co. NMPC
Dept.	Phone # 831-7231
Fax # (821) 3549	Fax # 831-7543

May 14, 1997

Mr. Leonard Fiume
Superintendent of Power Delivery
Frontier Region
Niagara Mohawk Power Corporation
144 Kensington Avenue
Buffalo, New York 14214

Dear Mr. Fiume:

Saginaw Site #915152
Buffalo (C), Erie County

Starting in 1995 General Motors Corporation (GM), in partnership with the New York State Department of Environmental Conservation (DEC), undertook an environmental investigation of property known as the Saginaw site located immediately east of the American Axle & Manufacturing (AAM) facility located on East Delevan. I have enclosed a fact sheet that was issued in May 1996 for your information.

The environmental investigation has developed information which indicates that soil containing poly chlorinated biphenyl (PCBs) contamination was found near the eastern fence line of the AAM's Parking Lot #4. Although there is a source of PCB contamination on the AAM property, the contamination found on the eastern edge of the property suggests that property owned by Niagara Mohawk may be an additional source area. Our information indicates that Niagara Mohawk owns one of the properties east of Parking Lot #4, on Scajaquada Street, in the City of Buffalo.

This office would like to inform you of the site investigation results and discuss the further trackdown of PCB contamination of this area. As discussed, you will contact me at 851-7220 to set a meeting date that is mutually acceptable.

Sincerely,

Martin L. Doster, P.E.
Regional Engineer - Hazardous Waste
Remediation

/sz

Enclosure

cc: Mr. Mark Napolitan - General Motors
Dr. Kenneth Malinowski - Emcon

FACT SHEET

GM- Saginaw Site

Site I.D. No. 915152

Buffalo, New York

May 1996

Dear Interested Citizen:

General Motors Corporation (GM), in partnership with the New York State Department of Environmental Conservation (NYSDEC) and the New York State Department of Health (NYSDOH), would like to update you on the investigation of contamination in the area of Parking Lot No. 4 at GM's former Saginaw Division facility. The site is located between Scajaquada Street and East Delavan Avenue in Buffalo (see map) and is now owned by American Axle and Manufacturing, Incorporated.

The site is classified as a Class 3 site on the N.Y.S. Registry of Hazardous Waste Disposal Sites. This classification means that hazardous waste is present at the site, but does not pose a significant threat to public health or the environment and action may be deferred. However, GM, with oversight from the state, is currently performing a Site Investigation to assess the extent of lead and polychlorinated biphenyl (PCB) contamination within the soil, groundwater, and storm sewers at the site.

SITE BACKGROUND:

In 1989, soil excavated during cleanup of an industrial oil spill was found to contain elevated levels of PCBs. PCBs are a class of chemicals once widely used in industry in products such as electrical capacitors and transformers. Testing performed during the cleanup also showed the presence of ash-like fill on the site which contained lead.

As a result GM began an investigation to determine the nature and extent of the PCB and lead contamination and, if necessary, commence a remedial program for those areas found to be contaminated. Field work on this project began in March 1996. Activities included:

preparation of a site history report;
excavation of a clay tile pipe suspected to be the source of the PCB contamination;
excavation of fill surrounding the clay tile pipe;
installation of soil borings and collection of subsurface samples across Parking Lot No. 4;
sampling and testing of pre-existing and newly installed groundwater monitoring wells;
testing of soil, groundwater, sewer sediment, and sewer water samples for PCBs and lead;
evaluation of data.

RESULTS OF THE INVESTIGATION AND REMEDIAL ACTIVITIES

Subsurface Soils

Some soil samples around the removed clay pipe showed PCBs with the highest concentration being 180 parts per million (ppm). Unsaturated soils (soil above groundwater table) from the clay pipe area that exhibited PCBs above 50 ppm were excavated and disposed off-site at a permitted landfill.

The fill materials underneath the parking lot were found to contain lead up to 14,000 ppm. Some samples were determined to be hazardous based upon the test for leachability. The source of this fill is attributable to disposal practices of parties other than GM and was in place prior to GM taking ownership of the property in 1964.

Groundwater

PCBs were detected in the perched water zone in the area around the clay pipe. The site is underlain with native silty clay which prevents downward migration of the contaminants. No PCBs were detected in the on-site bedrock monitoring well, nor is there any indication of off-site migration of PCBs through groundwater. Lead levels above the NYS groundwater standards were found in the perched water zone. No lead contamination was detected in the on-site bedrock monitoring well.

Storm Sewers

The site storm sewer discharge contained both PCBs and lead in the water and sediments at low concentrations. Plans are currently being developed to clean the storm sewer system at the site.

RISK TO THE PUBLIC

Based on the site investigation information, the site does not pose a risk to human health. Exposure that could potentially result in a health hazard is limited to occupational exposure that could occur if PCB-contaminated soils were encountered by workers during subsurface excavation on the site. These hazards can be routinely addressed by standard health and safety protocols (on-site worker exposure which can be controlled). The site is fenced and monitored by plant security which restricts public access. Furthermore, the site is paved, providing an additional protection against exposure.

FUTURE WORK:

Additional investigations will be conducted in the first quarter of 1998 to assess what impact, if any, the site may pose to Scajaquada Creek. In addition, the remedial measures performed to date will be expanded to include final construction and operation of an oil and groundwater collection and treatment system, which was installed during the 1989 spill cleanup, to address the PCB contamination. The groundwater collection system is expected to be in operation in late 1998.

SITE CONTACTS:

In order to keep you informed about the site a document repository has been established at the East Delavan Public Library at 1187 East Delavan where you can review the site documents produced to date. If you have any environmental questions or comments about the former GM-Saginaw site, please contact one of the following engineers:

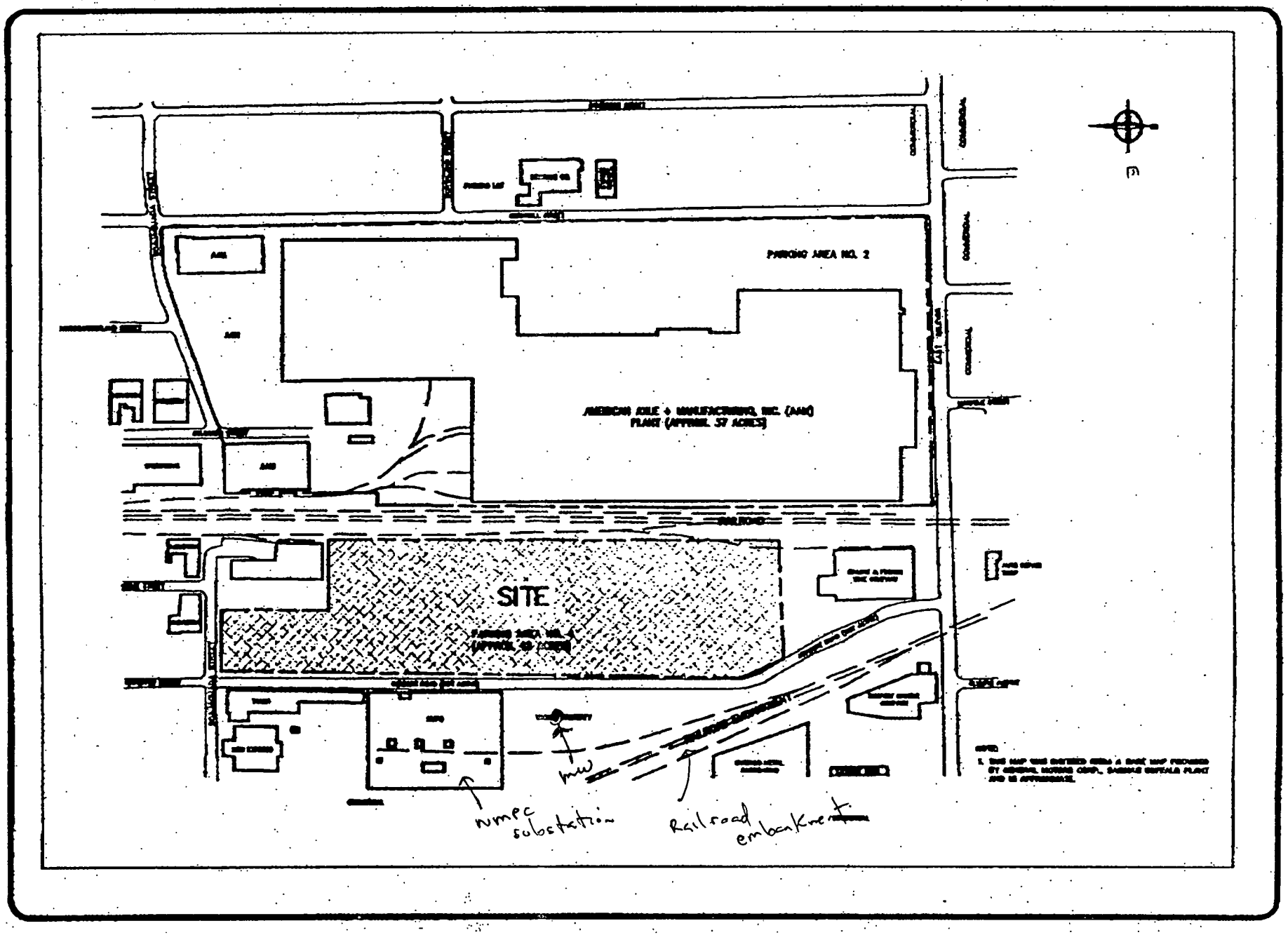
NYSDEC
Mr. Jaspal S. Walia, P.E.
Project Manager
or
Mr. Michael Podd
Citizen Participation Specialist
270 Michigan Avenue
Buffalo, New York 14203-2399
(716) 851-7220

General Motors Corporation
Mr. Mark Napolitan
Worldwide Facilities Group-Remediation Team
Mail Code 482-310-004
485 West Milwaukee Avenue
Detroit, MI 48202
(313) 556-5436

If you have any site related health concerns, please contact one of the following Department of Health personnel:

NYSDOH
Mr. Cameron O'Connor
Environmental Health Specialist
584 Delaware Avenue
Buffalo, New York 14202
(716) 847-4502

Ms. Anita Gabalski
Health Liaison Program
2 University Place
Albany, New York 12203
(800) 458-1158, Ext. 402


PARKING AREA NO. 2
SITE
numpc substation
Railroad embankment

GEOMATRIX

ATTACHMENT 2

REFERENCE SUMMARY FOR GM SAGINAW DIVISION, BUFFALO, NY REPORTS PROVIDED TO NYSDEC FROM EMCON (WEHRAN ENGINEERS)

Northeast Analytical, Inc., April 23, 1996. **PCB Sample Data Summary Package for EMCON.** Analytical Method: (NEA608CAP) HRGC Capillary Technique.

Northeast Analytical, Inc., May 30, 1996. **Analytical Testing of Water Sample MW-203 by GC/MS, Verification of Presence of PCB for EMCON.** Congener Data

Northeast Analytical, Inc., September 18, 1996. **Analytical Testing of Water Samples MW-203, MW-206 and MW-206,S4 by GC/MS, Verification of Presence of PCB for EMCON.** Congener Data

Northeast Analytical, Inc., September 15, 1996. **PCB Sample Data Summary Package for EMCON.** Analytical Method: (NEA608CAP) HRGC Capillary Technique.

Northeast Analytical, Inc., December 3, 1996. **PCB Sample Data Summary Package for EMCON.** Analytical Method: (NEA608CAP) HRGC Capillary Technique.

Upstate Laboratories, Inc., Sample Event March 21, 1995. **Sample Data Summary Package for EMCON – Volume 1 and 2 of 2.** Lead Analytical Data (soil sampling).

Upstate Laboratories, Inc., Sample Event March 24, and May 16 and 18, 1995. **Sample Data Summary Package for EMCON – Volume 1, 2, 3, and 4 of 4.** PCB and Lead Analytical Data (manholes sampling).

Upstate Laboratories, Inc., Sample Event March 24, 27, 28, 29, and 30, 1995 **Sample Data Summary Package for EMCON – Volume 1, 2, 3, and 4 of 4.** PCB Analytical Data (soil sampling).

Upstate Laboratories, Inc., Sample Event March 24 and 27, 1995. **Sample Data Summary Package for EMCON – Volume 1 of 2.** Lead Analytical Data (soil sampling).

Upstate Laboratories, Inc., Sample Event March 28, 1995. **Sample Data Summary Package for EMCON – Volume 1 of 2.** Lead Analytical Data (soil sampling).

Upstate Laboratories, Inc., Sample Event March 27, 28, and 29, 1995. **Sample Data Summary Package for EMCON – Volume 1 of 2.** Lead Analytical Data (TCLP soil sampling).

Upstate Laboratories, Inc., Sample Event March 27, 28, 29, and 30, 1995. **Sample Data Summary Package for EMCON – Volume 1 of 2.** Lead Analytical Data (soil sampling).

Upstate Laboratories, Inc., Sample Event March 29, and 30, and April 11, 17, and 21, 1995 **Sample Data Summary Package for EMCON – Volume 1, 2, 3, 4, and 5 of 5.** PCB Analytical Data (gw sampling).

Upstate Laboratories, Inc., Sample Event April 18 and 21, 1995. **Sample Data Summary Package for EMCON – Volume 1 and 2 of 2.** Lead Analytical Data (gw sampling).

Upstate Laboratories, Inc., Sample Event March 28 and April 3 and 4, 1996. **Sample Data Summary Package for EMCON – Volume 1, 2, 3, and 4 of 4.** PCB and Lead Analytical Data.

Upstate Laboratories, Inc., Sample Event March 28 and April 3 and 4, 1996. **Sample Data Summary Package for EMCON – Volume 1, 2, 3, and 4 of 4.** PCB and Lead Analytical Data.

Upstate Laboratories, Inc., Sample Event May 21, 1996. **Sample Data Summary Package for EMCON – Volume 1 and 2 of 2.** Lead Analytical Data.

Upstate Laboratories, Inc., Sample Event July 2 and 11, 1996. **Sample Data Summary Package for EMCON – Volume 1, 2, and 3 of 3.** PCB and Lead Analytical Data.

Upstate Laboratories, Inc., Sample Event September 9 and 11, 1996. **Sample Data Summary Package for EMCON – Volume 1, 2, and 3 of 3.** PCB and Lead Analytical Data.

Wehran – New York, Inc., December 1993. **Lead Sampling Project Oil Containment Area.**

Wehran – New York, Inc., July 1990. **Additional Investigations associated with Delineation of Clay Pipe Area.**

Wehran – New York, Inc., May 1993. **Soil Quality Evaluation of Former Test Pit TP-2.**

GEOMATRIX

ATTACHMENT 3

SUMMARY OF EMCON'S DATA VALIDATOR PCB ANALYTICAL DATA REVIEW COMMENTS

Letter from data validator (Data Validation Services) dated August 7, 1995 to Wehran EMCON requesting information on sample storage prior shipment to laboratory. Samples were received 4 days after sample collection and at room temperature.

Letter from data validator (Data Validation Services) dated September 18, 1995 to Wehran EMCON Data validation report for SDG EMC08 Poor correlation of the individual PCB isomer responses for a reported Aroclor 1242 in water sample form MW-203 and identification of PCB as a mixture is not assured.

Letter from data validator (Data Validation Services) dated August 31, 1995 to Wehran EMCON. Data validation report for SDG EMC01 through EMC07 and EMC09. "Identification of specific Aroclor mixtures is often difficult due to interferences and weathering, which can alter the relative ratio of individual isomer. Often the best match to a standard is reported although a good match is not possible. Review of the relative response of the isomers, as compared to standards, was done during validation. The ideal ratios would be 1:1 for all isomers. Some samples produced rations of more than 1:10, and identification becomes questionable. Due to poor individual isomer correlation, the following Aroclor mixture identifications should be considered tentative: MH-1 Aroclor 1248 and MW-203 – Aroclor 1242."

Letter from data validator (Data Validation Services) dated July 19, 1996 to Wehran EMCON. Data validation report for SDG EMC10 and EMC11. "Samples MW-203 and MW-406 (Geomatrix has assumed that the data validator is refering to MW-206 since MW-406 is not a well identified on the site map) were reanalyzed at client's request to verify reported PCB identifications. The reanalysis were within holding times... However, it should be noted that the sample individual isomer responses do not match well with the standard responses. This is true for the Aroclor 1242 and Aroclor 1260 identifications, but most particularly with the 1242, with variances (in what would ideally be 1:1 ratios) of up to 1:25. Review of the samples responses indicates that the presence of PCB isomers is very likely, but the identification of the Aroclor mixture(s) is extremely difficult due to sample interferences and possible weathering."

Letter from data validator (Data Validation Services) dated November 29, 1996 to Wehran EMCON. Data validation report for SDG EMC12, EMC13, EMC14, and EMC15. PCB analytical data for MW-206S-4, MW-203, and MW-206 should be flagged 'J'. Aroclor 1260 in MW-206-S4 and Aroclor 1242 in MW-412 should be considered tentative due to poor individual isomer correlation. Congener Analyses – "The reported identifications of Aroclor 1242/1248 in samples MW-203 and MW-206-S4 should be considered tentative, due to matrix interference prohibiting conclusive identification".

GEOMATRIX

ATTACHMENT 4

SUMMARY OF PCB CONGENER ANALYSES

Summary Of PCB Congener Sample Analysis:

Report Date: April 23, 1996

BL-96-8; MW-203

BL-96-8 - Visual Aroclor ID – 1248

Total PCBs = 161.8 ug/g

Homologs	Weight %		
Mono	0.21	Aroclor	Amount (ug/g)
Di	7.0	1221	0.33
Tri	31.13	1242	16.43
Tetra	41.7	1254 sed	3.5
Penta	12.19	1254 bio	5.97
Hexa	5.52	1260	0.08
Hepta	2.09		
Octa	0		

MW-203 - Visual Aroclor ID – Many non-PCB peaks; interference; potential 1248 peak

Total PCBs = 6.8 ug/l

Homologs	Weight %		
Mono	1.0	Aroclor	Amount (ug/l)
Di	8.7	1221	0.0065
Tri	29.7	1242	0.9
Tetra	29.11	1254 sed	0.15
Penta	13.91	1254 bio	0.17
Hexa	11.57	1260	0.08
Hepta	5.85		
Octa	0.18		

GEOMATRIX

Report Date: September 15, 1996
MW-203; MW-205; MW-205S; MW-206; MW-206 S-4

MW-203 - Visual Aroclor ID – Non-PCB interference
Total PCBs = 1.29 ug/l

Homologs	Weight %		
Mono	0	Aroclor	Amount (ug/g)
Di	6.1	1221	0
Tri	21.7	1242	0.1373
Tetra	29.6	1254 sed	0
Penta	9.5	1254 bio	0
Hexa	10.8	1260	0
Hepta	17.7		
Octa	3.2		

MW-205 - Visual Aroclor ID – None
Total PCBs = 0.0 ug/l

Homologs	Weight %		
Mono	0	Aroclor	Amount (ug/g)
Di	0	1221	0
Tri	43.6	1242	0.0012
Tetra	24.2	1254 sed	0
Penta	28.3	1254 bio	0
Hexa	3.9	1260	0
Hepta	0		
Octa	0		

MW-205S-1 - Visual Aroclor ID – None
Total PCBs = 0 ug/g

Homologs	Weight %		
Mono	0	Aroclor	Amount (ug/g)
Di	0	1221	0
Tri	21.7	1242	0.0009
Tetra	44.5	1254 sed	0
Penta	33.8	1254 bio	0
Hexa	0	1260	0
Hepta	0		
Octa	0		

GEOMATRIX

MW-206 - Visual Aroclor ID – Many non-PCB peaks; interference; potential 1242 or 1248 peak

Total PCBs = 4.95 ug/l

Homologs	Weight %		
Mono	3.46	Aroclor	Amount (ug/l)
Di	13.23	1221	0.1710
Tri	28.73	1242	0.6147
Tetra	24.23	1254 sed	0.852
Penta	8.76	1254 bio	0
Hexa	6.39	1260	0
Hepta	10.46		
Octa	4.46		

MW-206 S-4 - Visual Aroclor ID – Many non-PCB peaks; interference; potential 1242 or 1248 peak

Total PCBs = 19.11 ug/g

Homologs	Weight %		
Mono	1.53	Aroclor	Amount (ug/l)
Di	12.18	1221	0
Tri	39.66	1242	3.62
Tetra	37.44	1254 sed	0
Penta	9.44	1254 bio	0
Hexa	0	1260	0
Hepta	0		
Octa	0		

GEOMATRIX

Report Date: December 3, 1996
MW-207 S-3; MW-207 S-3 Dupe; MW-207

MW-207 S-3 - Visual Aroclor ID – None
Total PCBs = 0.08 ug/g

Homologs	Weight %		
Mono	0	Aroclor	Amount (ug/g)
Di	0	1221	0
Tri	59	1242	0.0034
Tetra	33	1254 sed	0
Penta	0	1254 bio	0
Hexa	0	1260	0
Hepta	0		
Octa	0		

MW-207S-3 Dupe - Visual Aroclor ID – None
Total PCBs = 0.07 ug/g

Homologs	Weight %		
Mono	0	Aroclor	Amount (ug/g)
Di	0	1221	0
Tri	60	1242	0.0028
Tetra	30	1254 sed	0
Penta	0	1254 bio	0
Hexa	0	1260	0
Hepta	0		
Octa	0		

MW-207 - Visual Aroclor ID – None
Total PCBs = 0.0 ug/l

Homologs	Weight %		
Mono	0	Aroclor	Amount (ug/l)
Di	9	1221	0
Tri	35	1242	0.0024
Tetra	23	1254 sed	0.0033
Penta	5	1254 bio	0
Hexa	14	1260	0
Hepta	13		
Octa	0		