Approved.

Worldwide Facilities Group
Environmental Services
Remediation Team

James F. Hartnett
Program Manager

May 20, 2008

Ms. Susan Edwards, P.E.
Bureau of Central Remedial Action
Division of Environmental Remediation
New York State Department of Environmental Conservation
625 Broadway, 12th floor
Albany, New York 12233

Re: General Motors- Former IFG Facility (Registry # 7-34-057) and Ley Creek Deferred Media Site
NYSDEC Administrative Order on Consent Index # D-7-0001-97-06
Baseline Ecological Risk Assessment – Ley Creek Fish Sampling Work Plan

Dear Ms. Edwards:

The purpose of this letter is to provide a revised work plan for sampling that will be conducted in Ley Creek in association with the investigation of General Motors Corporation's (GM) Former Inland Fisher Guide (IFG) and Ley Creek Deferred Media Site (Site) located in Syracuse, New York. As detailed in my letter to you of November 17, 2006, the objective of the sampling is to collect additional media data for use in the Baseline Ecological Risk Assessment (BERA). In addition, fish tissue samples will also be collected to satisfy data requirements for the human health risk assessment (HHRA). The scope of work described herein incorporates the New York State Department of Environmental Conservation's (NYSDEC) comments of August 20, 2007 and March 20, 2008. Additionally, the sampling event will be performed in accordance with the *1999 Supplemental Remedial Investigation/Feasibility Study (RI/FS) IFG Facility and Ley Creek Deferred Media Final Work Plan* (O'Brien & Gere 1999) Quality Assurance Project Plan (QAPP), Health and Safety Plan (HASP), and Field Sampling Plan (FSP) with the exception of a few modifications as discussed in Addendum A, B, and C, which are included herein as Attachment A.

Fish sampling was previously conducted in Ley Creek as part of the EDI Ley Creek Sampling Program in 1985 and the O'Brien & Gere Ley Creek Dredged Material Area Remedial Investigation in 1992. These data were provided as part of the Supplemental Remedial Investigation (SRI) for the Site in May 2000 and in the BERA Work Plan (BWP) (O'Brien & Gere 2001). From these studies, analytical results for biota displayed detectable concentrations of polychlorinated biphenyls (PCBs) present in the sampled fish tissue. Because a significant amount of time has transpired since the collection of these samples and some of the samples are not whole-body samples, GM intends to collect and analyze additional whole-body and filleted fish and crayfish tissue samples. Sediment samples will also be collected for chemical analysis.

Background
The Site is classified as a Class 2 site on the NYSDEC Registry of Inactive Hazardous Waste Disposal Sites (Site No. 7-34-057). The Site is also designated as a sub-site of the Onondaga Lake National Priorities List (NPL) site by NYSDEC and the United States Environmental Protection Agency (USEPA).

GM Remediation Team • One General Motors Drive (STE 2)• Syracuse, NY 13214
Phone (315) 289 0031 • FAX (315) 446 7123 • Email: jim.f.hartnett@gm.com

The Former IFG Facility comprises approximately 65 acres of property located at 1 General Motors Drive in the Town of Salina, Onondaga County, New York (Figure 1). A small portion of the property is located in the Town of Dewitt. The facility began operations in 1952; operations conducted at the facility included metal die casting; nickel, chromium and copper cyanide electroplating; stamping; polishing; buffing; painting; machining; and injection molding. Historically, the Former IFG Facility was used for the manufacture of metal automotive trim components such as bumpers, grills, wheel disks and hubcaps. The facility was subsequently used for the manufacture of interior and exterior plastic trim components such as bumpers, grills and door panels. Storm water runoff from the Former IFG Facility site is directed into a series of storm drains that discharge to Ley Creek via NYSDEC permitted outfalls #003 and #005. The facility is currently being redeveloped for tenant use.

The Ley Creek Deferred Media consist of ground water beneath the Ley Creek PCB Dredging Site, and surface water and sediment of Ley Creek between Town Line Road and Route 11 (Figure 1). For the purposes of this report, the two equal length segments (Site reach and Downstream reach) of Ley Creek located between the Town Line Road bridge and the Route 11 bridge are defined as the "study area" portion of Ley Creek (Figure 2); whereas the South Branch, Sanders Creek, North Branch, and segment of Ley Creek upstream of Town Line Road Bridge are identified as "upstream reaches" of the Site (Figure 3).

Objective

Fish and crayfish are considered receptors of concern because they are a major component of the aquatic food web and, in addition, people fishing in Ley Creek can potentially consume them. These biota may be exposed to constituents of concern (COCs) in surface water through gill exchange and dermal contact; they may be exposed to COCs in sediment through consumption of infaunal invertebrates; and they are known to be susceptible to reproductive impairment as a result of exposure to PCBs, one of the site-related COCs. Ultimately, higher trophic level birds and mammals as well as humans may consume the fish and crayfish in Ley Creek. During food chain exposure modeling in the BERA and human exposure modeling in the HHRA, it is GM's intention to utilize measured biota tissue PCB concentrations to reduce model uncertainty in the resulting hazard quotients and cancer risk (HHRA only). Therefore, the objective for the BERA is to collect additional fish and crayfish tissue data, for which whole-body samples will be analyzed for PCBs, percent lipids, as well as the additional COCs specified in the attached Table 3. Whole-body samples will consist of all body parts, including skin, scales, and shells (for crayfish only). For the HHRA, the objective is to collect edible fish fillets, which are the likely body component that potentially will be consumed by humans. In accordance with NYSDEC guidance, standard skin-on fillets (scale-less) will be collected and analyzed for constituents specified in Table 3. Bullhead and catfish species are an exception, as their skins will be removed from the fillets.

To address NYSDEC comments, GM has agreed to collect additional sediment samples from Ley Creek simultaneously with the biota tissue sampling. The objectives of the sediment sample collection are as follows:

- Sediment collected from the 0 to 6 inch interval will be evaluated with respect to fish tissue concentrations and used for calculation of an exposure point concentration for incidental ingestion in the food chain model
- Sediment collected from intervals below 6 inches will be used to further characterize the nature and extent of affected sediment in this reach of Ley Creek
- Sediment samples from upstream reaches of the creek will be collected to make statistical comparisons to analytical results and conditions from Site-impacted areas.

Biota Sampling Scope

Biota sampling and analysis will be performed in accordance with the NYSDEC Bureau of Habitat's October 2002 draft *Procedures for the Collection and Preparation of Aquatic Biota for Contaminant Analysis*. A three to five-day sampling effort will be performed by four O'Brien & Gere biologists during the summer of 2008. This crew will be a subset of the six individuals listed in the collection permit application (Attachment B). A reconnaissance will be performed prior to the sampling effort to identify appropriate access points to the creek reaches.

Biota samples will be collected from multiple locations of the Ley Creek study area and upstream reaches described above. Final sample locations will be selected based on field reconnaissance. The upstream locations will be selected a significant distance away from the study area to minimize the collection of individuals that may frequent the study area portion of the creek. As identified on Figure 3, the upstream sampling efforts will be divided equally between the North Branch of Ley Creek, the South Branch of Ley Creek, and Sanders Creek. The Upstream Ley Creek reach will not be targeted for sampling. Sampling in the North Branch will begin where this branch discharges to Ley Creek and proceed upstream approximately 2,500 feet until an adequate number of samples are collected. Sampling of the South Branch of Ley Creek and Sanders Creek will proceed, respectively, in the same manner.

The biota sampling success will be dependent on the techniques employed and the natural conditions that are present at the time and season of the sampling effort. The primary sampling method will be backpack electroshocking. Seine nets and wire minnow traps will also be utilized, if necessary, to supplement the electroshocking efforts. All fish captured, whether or not they are kept for analysis, will be identified to species and recorded by transect location. These data will be included in the sampling report and in the BERA. The electroshocker running time and settings will also be recorded.

During the field efforts, one biologist will wear a backpack electroshocking unit and traverse the length of the Ley Creek study area starting at the furthest downstream location. The unit will transmit an electric pulse into the water stunning the fish within the immediate area. The stunned fish will then float to the surface long enough to allow the additional biologists to collect the fish with wooden-handled dip nets. High voltage-rated rubber gloves and neoprene waders will be worn by each biologist. If necessary, seining will be performed at select locations within the creek. Multiple "Gee" minnow traps will be placed at various locations in the study areas during the extent of the sampling event. The traps will be checked twice a day.

As requested by the NYSDEC, an attempt to collect crayfish will be made by placing baited minnow traps at multiple locations in each sampling reach. Traps will be checked at least twice daily. Also, dip-netting will be performed concurrently with the electrofishing to survey for and collect crayfish.

For this assessment, O'Brien & Gere will attempt to collect 26 fish tissue samples (6 whole-body and 20 fillet and remainder samples) from the Site and Downstream reaches as presented on Table 1. Six fish tissue samples (2 whole-body and 4 fillet and remainder samples) will be collected for each of the three Upstream reaches for a total of 18 fish tissue samples (6 whole-body and 12 fillet and remainder samples). The target minimum number of invertebrate samples for this effort is a total of 4 samples from the Site and Downstream reaches, and a total of 3 samples from the Upstream reaches (North Branch, South Branch, Sanders Creek).

To maximize data utilization of fish collected in the size ranges consumed by both ecological and human receptors, fillets and the fish remainders will be analyzed separately, when feasible. The resulting fillet

and remainder data will be combined when utilized in the BERA food chain models. Fish tissue (whole-body and fillet with remainder) and crayfish samples will be analyzed for constituents identified as BERA and HHRA COCs as presented on Table 3. Table 5 presents the sample analytical parameters.

Water quality parameters (*i.e.*, dissolved oxygen, turbidity, pH, temperature, and conductivity) will also be measured at select sampling locations using a direct-reading water quality instrument.

GM welcomes NYSDEC representatives to attend the sampling event. In their absence, GM recommends that the NYSDEC provide contact information of a representative, to be contacted by GM's field team leader, that has the ability to comment on and sanction decisions made in the field as a result of field conditions, species caught, size acceptable, location, or other issues.

Target Organisms – Ecological Exposure
Due to their potential to bioaccumulate chemicals, fish species foraging on sediment-associated food will be one of the targets (*e.g.*, brown bullhead [*Ictalurus nebulosus*]). Target fish species selected, as presented on Table 1, tend to have a limited home range (*e.g.*, shiners, dace, bullhead), but, given the small number of fish species that are likely to be caught, the sampling team may have to select more far ranging species. Table 1 lists target species and priority of collection in each size class. The list also represents an estimate of fish species and size classes that are likely to be encountered during this effort. This information is based in part on the results of historical fish sampling performed in Ley Creek.

An effort will be made to collect the same species for each type of sample (whole-body and fillet) and each size class across the subject areas. The fish captured in each transect will be held until a determination can be made on the most prevalent and appropriate species and size classes (for composites) for use across all sampling locations. This will maximize the opportunity to match the sample sets of the two site and three upstream sampling areas. Priority will be given to the collection of fish within the size range preferred by the ecological receptors to be modeled in the BERA (*i.e.*, belted kingfisher [*Ceryle alcyon*], great blue heron [*Ardea herodias*] and mink [*Mustela vison*]), as further discussed in text extracted from the Geddes Brook/Ninemile Creek BERA (TAMS 2003), below.

Prey typically consumed by the belted kingfisher range between 4 and 14 centimeters (cm) (Davis 1982; Brooks and Davis 1987), although they may consume fish up to 18 cm (Sayler and Lagler 1946). Great blue herons mainly eat fish 3 to 33 cm in length (Alexander 1977), but may consume fish as large as 60 cm (Eckert and Karalus 1983). Krebs (1947) found that smaller prey were selected more frequently because of greater abundance and less handling time. The golden shiner (*Notemigonus crysoleucas*) comprised the greatest proportion of fish in the mink diet from Montezuma Marsh in New York State and were generally 8 to 11 cm, while mink belonging to a Montana riverine population fed mainly on brook stickleback (*Culaea inconstans*) that were about 4 to 6 cm (Gilbert and Nancekivell 1982).

Based on this information, the target size for fish collection is between 2 and 13 inches (4 to 33 centimeters). As presented on Table 1, biologists will attempt to collect a suitable number of samples in each fish size class.

Target Organisms – Human Exposure
The Fish Contaminant Workgroup of the USEPA lists three criteria for target species selection for assessing risks to human health from fish consumption (USEPA 2000):

- The species are desirable for consumption and are of recreational, commercial, or subsistence value

- Bioaccumulation potential of the species is high
- The species have a wide geographic distribution.

For the evaluation of human health risks associated with the ingestion of fish from Ley Creek, GM proposes to collect species that are likely to be caught and consumed by humans. Historical sampling efforts indicate that the likely species include, among others: white sucker (*Catostomus commeroni*), carp (*Cyprinus carpio*), and pumpkinseed (*Lepomis gibbosus*). Because available habitat is limited and prior sampling efforts indicate a paucity of larger fish, GM will expand the target species to include any species typically considered "consumable" with a size range from 6 to 13 inches (15 to 33 centimeters) as seen on Table 1. Once these fish are collected and processed, the fillets and remains will be submitted for tissue residue analysis. Fish collected in the 6 to 13 inch range will be handled in a manner that will allow the use of the data for both ecological and human health risk assessments. Fish fillets and remains will be analyzed separately, and then the data will be combined representing a whole-body analysis for use in the BERA.

GM will discuss the fact that certain populations eat the entire body of the fish in the uncertainty section of the HHRA. GM does not believe that this practice is significant enough among the individuals that may catch fish within the subject water bodies to justify adding an additional exposure scenario to the HHRA.

Sediment Sampling Scope
As summarized on Table 2, sediment will be sampled from up to 12 locations selected in the Site and Downstream reaches. This equates to 24 samples, approximately one sample location per 750 feet of creek reach. Samples will be collected from the 0 to 6 inch and, unless refusal occurs, 6 to 12-inch intervals.

Initial priority will be given to depositional area locations adjacent to fish collection locations. Following fish collection, remaining locations will be selected with bias toward the same general location as the 1998 samples. This sampling strategy will allow for a more recent characterization of the nature and extent of affected sediment as well as a comparison with the 1998 Ley Creek sediment samples.

Additionally, three locations will be sampled in each of the three upstream reaches (9 total samples). As outlined above, sample collection will occur in areas where fish are collected. Supplemental locations will be selected, if necessary, to coincide with historical samples.

Sediment samples will be analyzed for constituents identified as BERA and HHRA COCs as presented on Table 4. Table 5 presents the sample analytical requirements.

Analysis
The collected biota will be identified to species (Family for crayfish), weighed, measured, bagged in labeled plastic bags and stored in coolers on wet ice in preparation for overnight delivery to the analytical laboratory. Twelve whole-body fish and seven whole-body crayfish tissue samples will be submitted for analysis as well as 32 fillet and remains tissue samples. A total weight of approximately 80 grams of tissue is required to run the required analyses. At each location, the samplers will attempt to take discrete fish and crayfish tissue samples totaling greater than 80 grams. When necessary, species-specific composite samples will be processed to meet the minimum mass requirement. Nine samples will be analyzed for quality assurance/quality control (QA/QC) purposes (matrix spike [MS], MS duplicate, and field duplicate) for each analytical parameter associated with biota tissue. Ten samples will be analyzed

for QA/QC purposes for each sediment analytical parameter. Table 5 presents a summary of the analytical methods and QA/QC requirements.

If there are multiple fish tissue samples to choose from within the target fish length for submittal to the lab, the samples containing fewer individual fish will be submitted for analysis. If individual fish need to be composited for tissue analysis the following procedures will be practiced:

- Biometrics for each individual within the composite will be recorded and reported
- Any individuals targeted for compositing will first be sorted by length to determine if there appears to be different age classes. If there are any differences in length then individuals of similar lengths will be composited together.
- A biologist from the NYSDEC will be consulted on the compositing before the fish are packed and shipped for analysis.

The collected biota tissue and sediment samples will be submitted to Accutest Laboratories of Dayton, New Jersey for analysis of select COCs as established for the BERA and HHRA deliverables (presented on Tables 3 and 4). As shown on Table 5, the following analytical methods will be performed for each sample: TAL metals – NYSDEC ASP Method 6010B, 7470A/7471A (mercury), 9010B/9014 or 9012 (cyanide); methyl mercury – USEPA Method 1630; polychlorinated biphenyls – NYSDEC ASP Method 8082 and USEPA Method 3540C (Soxhlet extraction); semivolatile organic compounds (SVOCs) – NYSDEC ASP Method 8270C; percent moisture - USEPA Method 160.3; percent lipids (biota tissue only) – USEPA Method 3540C (Soxhlet extraction); total organic carbon (sediment analysis only) – Lloyd Kahn Method; and AVS/SEM metals bioavailability (sediment analysis only) – USEPA Method 821-R-91-100. In accordance with NYSDEC's correspondence of May 19, 2008, analysis of volatile organic compounds (VOCs) in sediment is not required.

A sample of reference material for PCB analysis submitted by the NYSDEC will be analyzed at the same time as the fish collected during this sampling event. When the fish sampling event and arrangements are finalized, O'Brien & Gere will provide the NYSDEC Division of Fish, Wildlife and Marine Resources with contact information for Accutest Laboratories for shipment of the reference material.

The analytical results will be validated and a data summary report will be provided, in accordance with the requirements of the Consent Order. The validated data will be evaluated and presented in the BERA Report. A "License to Collect or Possess" from the NYSDEC has been obtained. The collector's license is included for your information as Attachment B.

Schedule

GM plans to implement the scope of work in June 2008. It is anticipated that the collection effort will continue until all fish tissue targets are met (a minimum of three to five days). If sampling cannot be completed within the designated time period, GM will seek approval from NYSDEC prior to discontinuing sampling. GM will notify NYSDEC two weeks in advance of the start of the sampling efforts. Following receipt by the laboratory, analysis and validation of the analytical data is anticipated to take approximately 10 to 12 weeks.

GM looks forward to the agencies' concurrence with the proposed sample collection efforts in association with the BERA. If you have any questions, please contact Clare Leary at (315) 437-6100 or me at (315) 463-2391.

References

Alexander, G.R. 1977. *Food of vertebrate predators in trout waters in north central lower Michigan.* Michigan Academ. 10:181-195.

Brooks, R. P. and W. J. Davis. 1987. *Habitat selections by breeding belted kingfishers (Ceryle alcyon).* Am. Midl. Nat. 117:63-70.

Davis, W. J. 1982. *Territory size in Megaceryle alcyon along a stream habitat.* Auk. 99:353-362.

Eckert, A. W., and K. E. Karalus. 1983. *The wading birds of North America: North of Mexico. Weathervane Books.* New York, NY, 226 pp.

Gilbert, F. F. and E. G. Nancekivell. 1982. *Food habits of mink (Mustela vision) and otter (Lutra canadensis) in Northeastern Alberta. Canadian Journal of Zoology.* 60:1283-1288

Krebs, C. J. 1977. *Ecology – The Experimental Analysis of Distribution and Abundance (Third Edition). Harper Collins Publishers, Inc.* New York, NY.

New York State Department of Environmental Conservation (NYSDEC). 2002. *DRAFT Procedures for Collection and Preparation of Aquatic Biota for Contaminant Analysis.* Division of Fish, Wildlife & Marine Resources. October 2002.

O'Brien & Gere. 2002. *Supplemental Human Health Risk Assessment: Former IFG Facility and Ley Creek Deferred Media.* Syracuse, New York. March 2002.

O'Brien & Gere. 2001. *BERA Work Plan: Former IFG Facility and Ley Creek Deferred Media.* Syracuse, New York. June 2001.

O'Brien & Gere. 1999. *Supplemental Remedial Investigation/Feasibility Study Former IFG Facility and Ley Creek Deferred Media.* Syracuse, New York. October 1999.

Sayler, II, J. C. and K. F. Lagler. 1946. *The Eastern Belted Kingfisher Megaceryle alcyon (Linnaeus), in relation to fish management.* Trans. Am. Assoc. 76:97-117.

TAMS Consultants, Inc. (TAMS). 2003. *Geddes Brook/Ninemile Creek Baseline Ecological Risk Assessment. Original document prepared for Honeywell, East Syracuse, NY by Exponent, Bellevue, WA. Revision prepared for New York State Department of Environmental Conservation, Albany, NY by TAMS Consultants, Inc., New York, NY and YEC, Valley Cottage, NY.* July 2003.

USEPA. 2000. *Guidance for Assessing Chemical Contaminant Data for Use in Fish Advisories, Fish Sampling and Analysis, Volume 1.* EPA 823-B-00-007.

Sincerely,

James F. Hartnett /CFL

James F. Hartnett
Remedial Program Manager

I:\DIV71\Projects\4966\34128\2_corres\Agencies\Fish_sampling_wp_rev_final_NonVOC2.doc

cc: Distribution List
Stephen E. Mooney – O'Brien & Gere
William A. Schew, Ph.D. – O'Brien & Gere

TABLES

Table 1
Former IFG Facility and Ley Creek Deferred Media
General Motors Corporation
Ley Creek Fish Sampling Work Plan
Target Fish and Crayfish Samples

Sample Position	Specific Area	Size Distribution[1]	Number of Samples[2]	Sample Type[3]	Target Species[4]		
					Primary Targets	Secondary Targets	Tertiary Targets
Site Reach	Town Line Road to 4500 feet down stream	1.5 - 6 in (3.8 - 15.2 cm)	3	Whole Fish	golden shiner	Longnose dace, Eastern blacknose dace	pumpkinseed, white sucker, bass
		6 - 13 in (15.2 - 33 cm)	5	Fillet and Remainder	carp	brown bullhead	pumpkinseed, white sucker, bass
		1 - 4 in (2.5 - 10 cm)	2	Whole Crayfish	Up to 8 species of crayfish inhabit central New York waters. No particular species will be a target for analysis.		
Downstream Reach	4501 feet west of Town Line Road to Route 11 Bridge	1.5 - 6 in (3.8 - 15.2 cm)	3	Whole Fish	golden shiner	Longnose dace, Eastern blacknose dace	pumpkinseed, white sucker, bass
		6 - 13 in (15.2 - 33 cm)	5	Fillet and Remainder	carp	brown bullhead	pumpkinseed, white sucker, bass
		1 - 4 in (2.5 - 10 cm)	2	Whole Crayfish	Up to 8 species of crayfish inhabit central New York waters. No particular species will be a target for analysis.		
Upstream Reaches	North Branch - starting where the North Branch meets the confluence of South Branch and working upstream approximately 2,500 feet	1.5 - 6 in (3.8 - 15.2 cm)	2	Whole Fish	golden shiner	Longnose dace, Eastern blacknose dace	pumpkinseed, white sucker, bass
		6 - 13 in (15.2 - 33 cm)	2	Fillet and Remainder	carp	brown bullhead	pumpkinseed, white sucker, bass
		1 - 4 in (2.5 - 10 cm)	1	Whole Crayfish	Up to 8 species of crayfish inhabit central New York waters. No particular species will be a target for analysis.		
	South Branch starting at confluence with Ley Creek and working upstream approximately 2,500 feet	1.5 - 6 in (3.8 - 15.2 cm)	2	Whole Fish	golden shiner	Longnose dace, Eastern blacknose dace	pumpkinseed, white sucker, bass
		6 - 13 in (15.2 - 33 cm)	2	Fillet and Remainder	carp	brown bullhead	pumpkinseed, white sucker, bass
		1 - 4 in (2.5 - 10 cm)	1	Whole Crayfish	Up to 8 species of crayfish inhabit central New York waters. No particular species will be a target for analysis.		
	Sanders Creek - starting at the confluence with South Branch and working upstream approximately 2,500 feet	1.5 - 6 in (3.8 - 15.2 cm)	2	Whole Fish	golden shiner	Longnose dace, Eastern blacknose dace	pumpkinseed, white sucker, bass
		6 - 13 in (15.2 - 33 cm)	2	Fillet and Remainder	carp	brown bullhead	pumpkinseed, white sucker, bass
		1 - 4 in (2.5 - 10 cm)	1	Whole Crayfish	Up to 8 species of crayfish inhabit central New York waters. No particular species will be a target for analysis.		

Notes:

1) The 1.5-6 inch size class makes up the majority of the diet of the subject ecological receptors and the 6-13 inch group is applicable for the HHRA. Size range for crayfish is typical for species inhabiting this region.

2) A minimum of 80g of biota tissue is required for laboratory anaysis. The priority for samples will be single fish, but compositing is likely for the smaller size class due to laboratory mass requirements. Only fish of the same species and a similar size class will be composited for analysis. If there are multiple fish tissue samples to choose from within the target fish length, the samples containing fewer individual fish will be submitted for analysis. EPA guidance suggests that the smallest fish in any composite sample be no less than 75% of the largest fish size in the sample. Do to their low mass, crayfish samples will be composites of multiple individuals.

3) Fish greater than 6 inches in length will be used for both the HHRA and the BERA. Fillets will be separated from the remainder of the fish and both portions (fillets and remainder) will be analyzed separately. Resulting fillet data will be utilized in the HHRA. Fillet and remainder data results will be combined for use in the BERA.

4) The objective is to collect the same species from each sampling reach to allow data comparisons between reaches.

Table 2
Former IFG Facility and Ley Creek Deferred Media
General Motors Corporation
Ley Creek Fish Sampling Work Plan
Sediment Sampling Scope

Segment	Specific Area	Segment Length (feet)	Depth Interval	Maximum Number of Samples per Segment	Sample Rationale
Site Reach	Town Line Road to 4500 feet downstream (west)	~4500	0-6 inches	6	Characterize selected receptor exposure and nature and extent of affected sediment
			6-12 inches	6	Characterize the nature and extent of affected sediment
Downstream Reach	4501 feet downstream (west) of Town Line Road to Route 11 Bridge	~4500	0-6 inches	6	Characterize selected receptor exposure and nature and extent of affected sediment
			6-12 inches	6	Characterize the nature and extent of affected sediment
Upstream Reaches	North Branch - starting where the North Branch meets the confluence of South Branch and Sander's Creek	~2500	0-6 inches	3	Characterize selected receptor exposure and nature and extent of affected sediment
			6-12 inches	3	Characterize the nature and extent of affected sediment
	South Branch starting at confluence with Ley Creek and working upstream	~2500	0-6 inches	3	Characterize selected receptor exposure and nature and extent of affected sediment
			6-12 inches	3	Characterize the nature and extent of affected sediment
	Sanders Creek - starting at the confluence with South Branch and working upstream	~2500	0-6 inches	3	Characterize selected receptor exposure and nature and extent of affected sediment
			6-12 inches	3	Characterize the nature and extent of affected sediment

Table 3
Former IFG Facility and Ley Creek Deferred Media
General Motors Corporation
Ley Creek Fish Sampling Work Plan
Fish and Crayfish Tissue Analytical Constituents

Constituent	BERA Rationale[1]	HHRA Rationale[2]	Proposed Tissue Analyte[3]	Priority[4]
Metals				
Aluminum	COC in BERA WP	Sediment/Surface Water COC in HHRA	No - Excluded based on best professional judgement	0
Antimony	---	Sediment/Surface Water COC in HHRA	**Yes**	2
Arsenic	COC in BERA WP	Sediment COC in HHRA	**Yes**	2
Barium	---	Sediment/Surface Water COC in HHRA	**Yes**	2
Beryllium	---	Sediment/Surface Water COC in HHRA	**Yes**	2
Cadmium	COC in BERA WP	Sediment COC in HHRA	**Yes**	2
Calcium	Limited information in BERA WP	Sediment/Surface Water COC in HHRA	No - Essential Nutrient	0
Chromium	---	Sediment/Surface Water COC in HHRA	**Yes**	2
Cobalt	COC in BERA WP	Sediment COC in HHRA	**Yes**	2
Copper	---	Sediment/ Surface Water COC in HHRA	**Yes**	2
Cyanide	---	Sediment COC in HHRA	**Yes**	2
Iron	COC in BERA WP	Sediment/Surface Water COC in HHRA	No - Essential Nutrient	0
Lead	---	Sediment/Surface Water COC in HHRA	**Yes**	2
Magnesium	Limited information in BERA WP	Sediment/Surface Water COC in HHRA	No - Essential Nutrient	0
Manganese	---	Sediment/Surface Water COC in HHRA	**Yes**	2
Mercury	Added per NYSDEC comment	Sediment COC in HHRA	**Yes**	1
Nickel	---	Sediment/Surface Water COC in HHRA	**Yes**	2
Potassium	Limited information in BERA WP	Sediment/Surface Water COC in HHRA	No - Essential Nutrient	0
Selenium	COC in BERA WP	Sediment COC in HHRA	**Yes**	2
Silver	Limited information in BERA WP	Sediment COC in HHRA	**Yes**	2
Sodium	Limited information in BERA WP	Sediment/Surface Water COC in HHRA	No - Essential Nutrient	0
Thallium	COC in BERA WP	Sediment COC in HHRA	**Yes**	2
Vanadium	---	Sediment COC in HHRA	**Yes**	2
Zinc	COC in BERA WP	Sediment/Surface Water COC in HHRA	**Yes**	2
Other				
Methyl mercury	Added per NYSDEC comment	Not listed in the HHRA	**Yes**	1
TCDD (TEQ)	COC in BERA WP	Sediment COC in HHRA	No - Not a significant risk driver	0
PCBs				
Aroclor 1016	COC in BERA WP	Sediment COC in HHRA	**Yes**	1
Aroclor 1242	COC in BERA WP	Sediment COC in HHRA	**Yes**	1
Aroclor 1248	COC in BERA WP	Sediment/Surface Water COC in HHRA	**Yes**	1
Aroclor 1254	COC in BERA WP	Sediment COC in HHRA	**Yes**	1
Aroclor 1260	COC in BERA WP	Sediment COC in HHRA	**Yes**	1
VOCs				
1,4-dicholorobenzene	---	Sediment COC in HHRA	No - VOCs are not expected to bioaccumulate	0
2 - butanone	Limited information in BERA WP	Sediment COC in HHRA	No - VOCs are not expected to bioaccumulate	0
Acetone	---	Sediment COC in HHRA	No - VOCs are not expected to bioaccumulate	0
Carbon disulfide	COC in BERA WP	Sediment COC in HHRA	No - VOCs are not expected to bioaccumulate	0
Chloromethane	---	Surface Water COC in HHRA	No - VOCs are not expected to bioaccumulate	0
cis-1,2-dichloroethene	---	Surface Water COC in HHRA	No - VOCs are not expected to bioaccumulate	0
Ethylbenzene	---	Sediment COC in HHRA	No - VOCs are not expected to bioaccumulate	0
Methylene chloride	Limited information in BERA WP	Surface Water COC in HHRA	No - VOCs are not expected to bioaccumulate	0
Tetrachloroethene	---	Sediment COC in HHRA	No - VOCs are not expected to bioaccumulate	0
Trichloroethene	---	Sediment/Surface Water COC in HHRA	No - VOCs are not expected to bioaccumulate	0

Table 3
Former IFG Facility and Ley Creek Deferred Media
General Motors Corporation
Ley Creek Fish Sampling Work Plan
Fish and Crayfish Tissue Analytical Constituents

Constituent	BERA Rationale[1]	HHRA Rationale[2]	Proposed Tissue Analyte[3]	Priority[4]
Vinyl chloride	Limited information in BERA WP	Surface Water COC in HHRA	No - VOCs are not expected to bioaccumulate	0
Xylene (total)	COC in BERA WP	Sediment COC in HHRA	No - VOCs are not expected to bioaccumulate	0
SVOCs				
2,4 - dimethylphenol	Limited information in BERA WP	Sediment COC in HHRA	**Yes**	**3**
2-methylnaphthalene	---	Sediment COC in HHRA	**Yes**	**3**
2 - methylphenol	Limited information in BERA WP	Sediment COC in HHRA	**Yes**	**3**
4-methylphenol	---	Sediment COC in HHRA	**Yes**	**3**
Acenaphthene	COC in BERA WP	Sediment COC in HHRA	**Yes**	**3**
Acenaphthylene	COC in BERA WP	Sediment COC in HHRA	**Yes**	**3**
Anthracene	COC in BERA WP	Sediment COC in HHRA	**Yes**	**3**
Benzo(a)anthracene	COC in BERA WP	Sediment COC in HHRA	**Yes**	**3**
Benzo(b)fluoranthene	COC in BERA WP	Sediment COC in HHRA	**Yes**	**3**
Benzo(a)pyrene	COC in BERA WP	Sediment COC in HHRA	**Yes**	**3**
Benzo(g,h,i)perylene	COC in BERA WP	Sediment COC in HHRA	**Yes**	**3**
Benzo(k)fluoranthene	COC in BERA WP	Sediment COC in HHRA	**Yes**	**3**
bis(2-Ethylhexyl)phthalate	COC in BERA WP	Sediment COC in HHRA	**Yes**	**3**
Butyl benzyl phthalate	---	Sediment COC in HHRA	**Yes**	**3**
Carbazole	Limited information in BERA WP	Sediment COC in HHRA	**Yes**	**3**
Chrysene	COC in BERA WP	Sediment COC in HHRA	**Yes**	**3**
Dibenzo(a,h)anthracene	COC in BERA WP	---	**Yes**	**3**
Dibenzofuran	COC in BERA WP	Sediment COC in HHRA	**Yes**	**3**
di-n-octyl phthalate	---	Surface Water COC in HHRA	**Yes**	**3**
Fluoranthene	COC in BERA WP	Sediment COC in HHRA	**Yes**	**3**
Fluorene	COC in BERA WP	Sediment COC in HHRA	**Yes**	**3**
Indeno(1,2,3-cd)pyrene	COC in BERA WP	Sediment COC in HHRA	**Yes**	**3**
Naphthalene	COC in BERA WP	Sediment COC in HHRA	**Yes**	**3**
Phenanthrene	COC in BERA WP	Sediment COC in HHRA	**Yes**	**3**
Phenol	---	Sediment COC in HHRA	**Yes**	**3**
Pyrene	COC in BERA WP	Sediment COC in HHRA	**Yes**	**3**

Notes:

1) Reason for inclusion/exclusion of COC as a tissue analyte from the BERA. BERA constituent list is extracted from May 31, 2007 Toxicity, Bioaccumulation, and Life *History Exposure Factors Submittal Comment Response.*

2) Reason for inclusion/exclusion of COC as a tissue analyte from the HHRA. HHRA constituent list extracted from Tables 2-10, 2-12 in the March 2002 Supplemental *Human Health Risk Assessment, Former IFG Facility and Ley Creek Deferred Media Site No. 7-34-057, General Motors Corporation (O'Brien & Gere).*

3) Indicates inclusion (yes) or provides a reason for exclusion of COC as a tissue analyte.

4) The objective will be to analyze tissue for all COCs. However, priority will be given to select analytes if collected tissue mass is insufficient to meet laboratory method requirements. 1 = highest, 3 = lowest, 0 = not analyzed. For example, if tissue mass is limited, then PCBs, mercury, and methyl mercury will be prioritized for analysis.

--- = not a COC in the respective assessment

Bold/Yes = constituent to be analyzed in tissue

No = constituent will not be analyzed in tissue

BERA WP = Baseline Ecological Risk Assessment Work Plan

COC = constituent of concern

HHRA = Human Health Risk Assessment

PCB = Polychlorinated biphenyl

SVOC = Semivolatile organic compound

TCDD (TEQ) = 2,3,7,8-Tetrachlorodibenzo-p-dioxin toxicity equivalence concentration

VOC = volatile organic compound

Table 4
Former IFG Facility and Ley Creek Deferred Media
General Motors Corporation
Ley Creek Fish Sampling Work Plan
Sediment Analytical Constituents

Constituent	BERA Rationale[1]	HHRA Rationale[2]	Proposed Sediment Analyte
Metals			
Aluminum	COC in BERA WP	Sediment/Surface Water COC in HHRA	judgement
Antimony	---	Sediment/Surface Water COC in HHRA	**Yes**
Arsenic	COC in BERA WP	Sediment COC in HHRA	**Yes**
Barium	---	Sediment/Surface Water COC in HHRA	**Yes**
Beryllium	---	Sediment/Surface Water COC in HHRA	**Yes**
Cadmium	COC in BERA WP	Sediment COC in HHRA	**Yes**
Calcium	Limited information in BERA WP	Sediment/Surface Water COC in HHRA	No - Essential Nutrient
Chromium	---	Sediment/Surface Water COC in HHRA	**Yes**
Cobalt	COC in BERA WP	Sediment COC in HHRA	**Yes**
Copper	---	Sediment/ Surface Water COC in HHRA	**Yes**
Cyanide	---	Sediment COC in HHRA	**Yes**
Iron	COC in BERA WP	Sediment/Surface Water COC in HHRA	No - Essential Nutrient
Lead	---	Sediment/Surface Water COC in HHRA	**Yes**
Magnesium	Limited information in BERA WP	Sediment/Surface Water COC in HHRA	No - Essential Nutrient
Manganese	---	Sediment/Surface Water COC in HHRA	**Yes**
Mercury	Added per NYSDEC comment	Sediment COC in HHRA	**Yes**
Nickel	---	Sediment/Surface Water COC in HHRA	**Yes**
Potassium	Limited information in BERA WP	Sediment/Surface Water COC in HHRA	No - Essential Nutrient
Selenium	COC in BERA WP	Sediment COC in HHRA	**Yes**
Silver	Limited information in BERA WP	Sediment COC in HHRA	**Yes**
Sodium	Limited information in BERA WP	Sediment/Surface Water COC in HHRA	No - Essential Nutrient
Thallium	COC in BERA WP	Sediment COC in HHRA	**Yes**
Vanadium	---	Sediment COC in HHRA	**Yes**
Zinc	COC in BERA WP	Sediment/Surface Water COC in HHRA	**Yes**
Other			
Methyl mercury	Added per NYSDEC comment	Not listed in the HHRA	**Yes**
TCDD (TEQ)	COC in BERA WP	Sediment COC in HHRA	No - Not a significant risk driver
PCBs			
Aroclor 1016	COC in BERA WP	Sediment COC in HHRA	**Yes**
Aroclor 1242	COC in BERA WP	Sediment COC in HHRA	**Yes**
Aroclor 1248	COC in BERA WP	Sediment/Surface Water COC in HHRA	**Yes**
Aroclor 1254	COC in BERA WP	Sediment COC in HHRA	**Yes**
Aroclor 1260	COC in BERA WP	Sediment COC in HHRA	**Yes**
VOCs			
1,4-dicholorobenzene	---	Sediment COC in HHRA	No - Not a significant risk driver
2 - butanone	Limited information in BERA WP	Sediment COC in HHRA	No - Not a significant risk driver
Acetone	---	Sediment COC in HHRA	No - Not a significant risk driver
Carbon disulfide	COC in BERA WP	Sediment COC in HHRA	No - Not a significant risk driver
Chloromethane	---	Surface Water COC in HHRA	No - Not a significant risk driver
cis-1,2-dichloroethene	---	Surface Water COC in HHRA	No - Not a significant risk driver
Ethylbenzene	---	Sediment COC in HHRA	No - Not a significant risk driver

Table 4
Former IFG Facility and Ley Creek Deferred Media
General Motors Corporation
Ley Creek Fish Sampling Work Plan
Sediment Analytical Constituents

Constituent	BERA Rationale[1]	HHRA Rationale[2]	Proposed Sediment Analyte
Methylene chloride	Limited information in BERA WP	Surface Water COC in HHRA	No - Not a significant risk driver
Tetrachloroethene	---	Sediment COC in HHRA	No - Not a significant risk driver
Trichloroethene	---	Sediment/Surface Water COC in HHRA	No - Not a significant risk driver
Vinyl chloride	Limited information in BERA WP	Surface Water COC in HHRA	No - Not a significant risk driver
Xylene (total)	COC in BERA WP	Sediment COC in HHRA	No - Not a significant risk driver
SVOCs			
2,4 - dimethylphenol	Limited information in BERA WP	Sediment COC in HHRA	**Yes**
2-methylnaphthalene	---	Sediment COC in HHRA	**Yes**
2 - methylphenol	Limited information in BERA WP	Sediment COC in HHRA	**Yes**
4-methylphenol	---	Sediment COC in HHRA	**Yes**
Acenaphthene	COC in BERA WP	Sediment COC in HHRA	**Yes**
Acenaphthylene	COC in BERA WP	Sediment COC in HHRA	**Yes**
Anthracene	COC in BERA WP	Sediment COC in HHRA	**Yes**
Benzo(a)anthracene	COC in BERA WP	Sediment COC in HHRA	**Yes**
Benzo(b)fluoranthene	COC in BERA WP	Sediment COC in HHRA	**Yes**
Benzo(a)pyrene	COC in BERA WP	Sediment COC in HHRA	**Yes**
Benzo(g,h,i)perylene	COC in BERA WP	Sediment COC in HHRA	**Yes**
Benzo(k)fluoranthene	COC in BERA WP	Sediment COC in HHRA	**Yes**
bis(2-Ethylhexyl)phthalate	COC in BERA WP	Sediment COC in HHRA	**Yes**
Butyl benzyl phthalate	---	Sediment COC in HHRA	**Yes**
Carbazole	Limited information in BERA WP	Sediment COC in HHRA	**Yes**
Chrysene	COC in BERA WP	Sediment COC in HHRA	**Yes**
Dibenzo(a,h)anthracene	COC in BERA WP	---	**Yes**
Dibenzofuran	COC in BERA WP	Sediment COC in HHRA	**Yes**
Di-n-octyl phthalate	---	Surface Water COC in HHRA	**Yes**
Fluoranthene	COC in BERA WP	Sediment COC in HHRA	**Yes**
Fluorene	COC in BERA WP	Sediment COC in HHRA	**Yes**
Indeno(1,2,3-cd)pyrene	COC in BERA WP	Sediment COC in HHRA	**Yes**
Naphthalene	COC in BERA WP	Sediment COC in HHRA	**Yes**
Phenanthrene	COC in BERA WP	Sediment COC in HHRA	**Yes**
Phenol	---	Sediment COC in HHRA	**Yes**
Pyrene	COC in BERA WP	Sediment COC in HHRA	**Yes**

Notes:

1) Reason for inclusion/exclusion of COC as a sediment analyte from the BERA. BERA constituent list is extracted from May 31, 2007 *Toxicity, Bioaccumulation, and Life History Exposure Factors Submittal Comment Response.*

2) Reason for inclusion/exclusion of COC as a sediment analyte from the HHRA. HHRA constituent list extracted from Tables 2-10, 2-12 in the March 2002 *Supplemental Human Health Risk Assessment, Former IFG Facility and Ley Creek Deferred Media Site No. 7-34-057, General Motors Corporation (O'Brien & Gere).*

3) Indicates inclusion (yes) or provides a reason for exclusion of COC as a sediment analyte.

--- = not a COC in the respective assessment

Bold/Yes = constituent to be analyzed in fish tissue

No = constituent will not be analyzed in fish tissue

BERA WP = Baseline Ecological Risk Assessment Work Plan

COC = constituent of concern

HHRA = Human Health Risk Assessment

PCB = Polychlorinated biphenyl

SVOC = Semivolatile organic compound

TCDD (TEQ) = 2,3,7,8-Tetraclorodibenzo-p-dioxin toxicity equivalence concentration

VOC = volatile organic compound

Table 5
Former IFG Facility and Ley Creek Deferred Media
General Motors Corporation
Ley Creek Fish Sampling Work Plan
Sample Handling and Analytical Requirements

Parameter and critical method	Matrix	Sample containers and mass	Preservation	Holding times	Number of Samples	QC sample frequency			
						Field duplicate	Trip blank	MS/MSD	Equipment blank
TAL Metals – NYSDEC ASP Methods[1] 6010B, 7470A/7471A, 9010B/9014/9012	Biota tissue	plastic zip-loc bags 5 grams	4°C	6 months from VTSR; 26 days from VSTR for mercury	51	1 per 20 samples or 1 per matrix (for less than 20 samples)	NA	1 per 20 samples or 1 per matrix (for less than 20 samples)	NA
	Sediment	4 ounce wide mouth glass container with a Teflon® lined lid			42				1 per event
Total Organic Carbon – Lloyd Kahn Method [2]	Sediment	4 ounce wide mouth glass container with a Teflon® lined lid	4°C	14 days from collection	42	1 per 20 samples or 1 per matrix (for less than 20 samples)	NA	1 per 20 samples or 1 per matrix (for less than 20 samples)	1 per event
AVS / SEM [3] – USEPA Method 821-R-91-100	Sediment	4 ounce wide mouth glass container with a Teflon® lined lid	4°C	14 days from collection	42	1 per 20 samples or 1 per matrix (for less than 20 samples)	NA	1 per 20 samples or 1 per matrix (for less than 20 samples)	1 per event
Methyl Mercury – USEPA Method 1630	Biota tissue	plastic zip-loc bags 5 grams	4°C	26 days from VTSR	51	1 per 20 samples or 1 per matrix (for less than 20 samples)	NA	1 per 20 samples or 1 per matrix (for less than 20 samples)	NA
	Sediment	4 ounce wide mouth glass container with a Teflon® lined lid			42				1 per event
PCBs – NYSDEC ASP Method 8082 [1] using the USEPA Method 3540C Soxhlet extraction	Biota tissue	plastic zip-loc bags 20 grams	4°C	5 days from VTSR to extraction; 40 days from extraction to analysis	51	1 per 20 samples or 1 per matrix (for less than 20 samples)	NA	1 per 20 samples or 1 per matrix (for less than 20 samples)	NA
	Sediment	4 ounce wide mouth glass container with a Teflon® lined lid			42				1 per event

Table 5
Former IFG Facility and Ley Creek Deferred Media
General Motors Corporation
Ley Creek Fish Sampling Work Plan
Sample Handling and Analytical Requirements

Parameter and critical method	Matrix	Sample containers and mass	Preservation	Holding times	Number of Samples	QC sample frequency			
						Field duplicate	Trip blank	MS/MSD	Equipment blank
Percent Lipids – USEPA Method 3540C Soxhlet extraction	Biota tissue	plastic zip-loc bags 5 grams	4°C	NA	51	1 per 20 samples or 1 per matrix (for less than 20 samples)	NA	1 per 20 samples or 1 per matrix (for less than 20 samples)	NA
SVOCs – NYSDEC ASP Method 8270C [1]	Biota tissue	plastic zip-loc bags 30 grams	4°C	5 days from VTSR to extraction; 40 days from extraction to analysis	51	1 per 20 samples or 1 per matrix (for less than 20 samples)	NA	1 per 20 samples or 1 per matrix (for less than 20 samples)	NA
	Sediment	4 ounce wide mouth glass container with a Teflon® lined lid			42				1 per event
Percent Moisture USEPA Method 160.3	Biota tissue	plastic zip-loc bags 5 grams	4°C	NA	51	1 per 20 samples or 1 per matrix (for less than 20 samples)	NA	1 per 20 samples or 1 per matrix (for less than 20 samples)	NA
	Sediment	4 ounce wide mouth glass container with a Teflon® lined lid			42	1 per 20 samples or 1 per matrix (for less than 20 samples)	NA	1 per 20 samples or 1 per matrix (for less than 20 samples)	NA

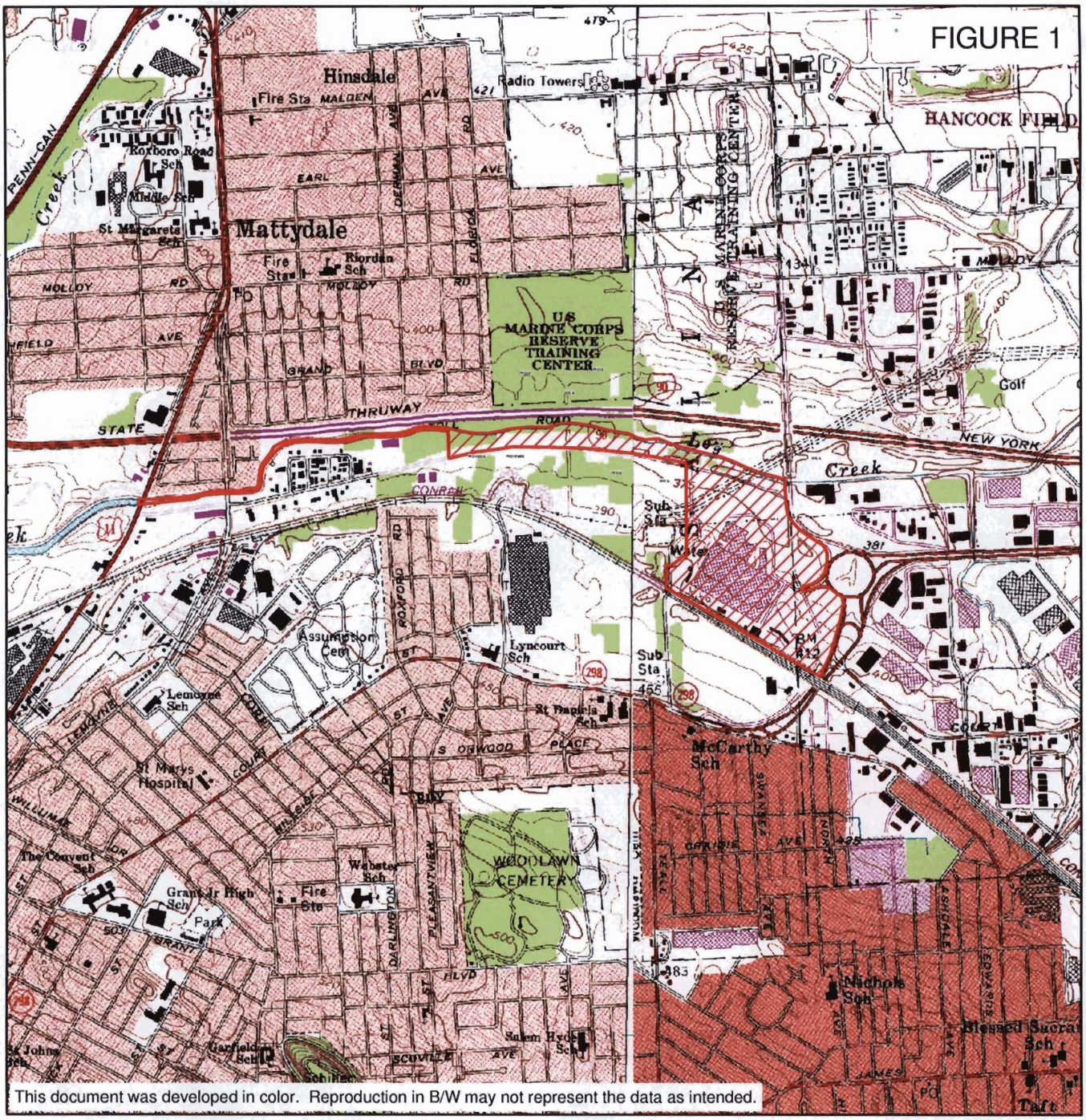
NOTES:
1 -NYSDEC ASP references New York State Department of Environmental Conservation *Analytical Services Protocol*, October 1995 Revisions, Albany, New York
2 - USEPA, Region II, Environmental Services Division, Monitoring Management Branch, *Determination of Total Organic Carbon in Sediment, Edison, New Jersey, 1988*
3 - AVS/SEM = acid volatile sulfides / simultaneously extracted metals – used to determine if metals are bioavailable in sediment
MS/MSD = matrix spike/matrix spike duplicate sample
NA = not applicable
PCBs = polychlorinated biphenyls
QC = quality control
SVOCs =semivolatile organic compounds
VTSR = verified time of sample receipt

FIGURES

I:\DIV71\Projects\4966\34128\BERA\Fish\SITE-LOC.MXD

PLOT DATE: 6/6/07 DIV. 14 AKM

FIGURE 1



ADAPTED FROM: SYRACUSE EAST AND SYRACUSE WEST, NEW YORK USGS QUADRANGLES

QUADRANGLE LOCATION

GENERAL MOTORS CORP.
FORMER IFG FACILITY AND
LEY CREEK DEFERRED MEDIA
SYRACUSE, NEW YORK

SITE LOCATION

SITE BOUNDARY

0 1,000 2,000 4,000 6,000 8,000

Feet

4966.34128
APRIL 2008

1:24,000

O'BRIEN & GERE

I:\DIV71\Projects\4966\34128\BERA\Fish\FISH_SAMPLE_STUDY_AREA.MXD

This document was developed in color. Reproduction in B/W may not represent the data as intended.

Source: 2003 aerial photographs downloaded from the NYSGIS Clearinghouse (http://www.nysgis.state.ny.us/gateway/mg/nysdop_download.cfm)

PLOT DATE: 09/14/07 DIV.14 AKM

FIGURE 2

GENERAL MOTORS CORP.
FORMER IFG FACILITY AND
LEY CREEK DEFERRED MEDIA
SYRACUSE, NEW YORK

FISH SAMPLING
SITE STUDY AREA

0 500 1,000 2,000
Feet

APRIL 2008
4966.34128

O'BRIEN & GERE

This document was developed in color. Reproduction in B/W may not represent the data as intended.

Source: 2003 aerial photographs downloaded from the NYSGIS Clearinghouse (http://www.nysgis.state.ny.us/gateway/mg/nysdop_download.cfm)

I:\DIV7\1\Projects\4966\34128\BERA\Fish\UPSTREAM_FISH_STUDY_AREA.MXD

PLOT DATE: 09/14/07 DIV.14 AKM

FIGURE 3

GENERAL MOTORS CORP.
FORMER IFG FACILITY AND
LEY CREEK DEFERRED MEDIA
SYRACUSE, NEW YORK

FISH SAMPLING UPSTREAM STUDY AREAS

0 500 1,000 2,000
Feet

APRIL 2008
4966.34128

O'BRIEN & GERE

ATTACHMENT A

ADDENDUM A

Quality Assurance Project Plan Modifications

Addendum A: Quality Assurance Project Plan (QAPP)

The *1999 Supplemental Remedial Investigation / Feasibility Study (RI/FS) Former Inland Fisher Guide (IFG) Facility and Ley Creek Deferred Media Final Work Plan* (1999 WP) QAPP will be followed for efforts performed as part of the Site's *Baseline Ecological Risk Assessment – Ley Creek Fish Sampling Work Plan* (2008 WP) with the exception of a few modifications as discussed herein. These modifications address Site-specific sampling and analytical procedures as described in the 2008 WP. Sections below refer to the associated section from the 1999 WP QAPP.

2.8. Laboratory QC coordinator

Deborah Andrasko of Conestoga-Rovers & Associates (CRA) (Niagara Falls, NY) and Mike Cordova of Accutest Laboratories (Dayton, New Jersey) will serve as the Laboratory QC Coordinators.

2.9. Laboratory sample custodian

Deborah Andrasko of CRA and Mike Cordova of Accutest will serve as the Laboratory Sample Custodians.

3.1. Project background

The project history and background are presented in the *Background* section of the 2008 WP.

3.2. Project definition

The project definition is presented in the *Objective* section of the 2008 WP.

4.1. Project description

The overall project description is presented in the Biota and Sediment Sampling Scope sections of the 2008 WP.

4.2. Project schedule

The project schedule is presented in the *Schedule* section of the 2008 WP.

5. Data quality objectives (DQOs)

Table 5-1. Sampling efforts, objectives, analyses, data uses, and analytical level.

Sampling effort	Objective	Types of analysis	Data uses	Analytical level [1]
Fish and crayfish (biota) tissue sampling	Characterize the nature and extent of contamination in the tissue of Ley Creek biota and provide data for use in Site risk assessments.	SVOCs PCBs TAL Metals Methyl Mercury Percent Lipids Percent Moisture	1. Assess risk. 2. Support remedial approach.	III
Sediment sampling	Characterize selected receptor exposure and nature and extent of affected Ley Creek sediment and provide data for use in Site risk assessment.	SVOCs PCBs TAL Metals TOC Methyl Mercury AVS/SEM Percent Moisture	1. Assess risk. 2. Support remedial approach.	III

Table 5-1. Sampling efforts, objectives, analyses, data uses, and analytical level.

Sampling effort	Objective	Types of analysis	Data uses	Analytical level [1]

Notes:
1 = See Section 5 of the 1999 QAPP for description of analytical levels.
AVS/SEM = acid volatile sulfides / simultaneously extracted metals -- used to determine if metals are bioavailable in sediment
PCBs indicate polychlorinated biphenyls.
SVOCs indicate semivolatile organic compounds.
TAL Metals indicate the target analyte list metals listed in Table 12-7 of the 1999 WP.
TOC indicates total organic carbon.

5.3. Laboratory analyses

To obtain data of a quality sufficient to meet the project DQOs, the following methods will be performed:

- SVOC analysis by GC/MS
- PCBs and Percent Lipids will use the Soxhlet extraction in biota tissue analysis
- Metal analysis by inductively coupled plasma (ICAP)
- Mercury analysis by cold vapor atomic absorption (AA) and by cold vapor atomic fluorescence spectrometry
- Cyanide analysis by spectrophotometer
- AVS/SEM will be used to analyze the bioavailability of metals in sediment
- TOC analysis by organic carbon analyzer.

The specific methods, analytical QA/QC, and data reporting will adhere to the analytical methods listed in Table 12-1.

6. Project narrative

The field tasks for the risk assessment will include sampling of biota tissue and sediment. The data will be for performance of human health and ecological risk assessments and to provide information for development, evaluation, and selection of remedial actions. The Revised Supplemental Remedial Investigation Report will document the field activities and associated results, and the Supplemental Feasibility Study Report will document the identification and evaluation of remedial alternatives.

Data usability with respect to the data quality objectives and data uses will be compared to the project requirements. In the event that the completeness objective of 90% is not achieved, samples will be recollected at the discretion of the project stakeholders.

The sample locations are discussed in Section 9.3, below. The sample custody requirements are presented in Section 11. The analytical methods to be used in this investigation are listed in Table 12-1. Accutest Laboratories of Dayton, New Jersey will perform the analytical services.

The data results will be reported to O'Brien & Gere in NYSDEC ASP Category B format. Full data validation will be performed on the analytical data. At the discretion of the Project Manager, field and laboratory performance audits will be performed during the field program and during the laboratory analysis program. Corrective action procedures will be implemented.

9.3. Sampling locations

Sampling locations for the investigation are described the Biota and Sediment Sampling Scope sections, Tables 1 and 2, and identified on Figures 2 and 3 of the 2008 WP. Table 9-1, below, presents the summary of field sampling procedures and analytical requirements for the sampling event.

Table 9-1. *Field sampling summary*

Parameter and critical method	Matrix	Sample containers and mass	Preservation	Holding times	Number of Samples	QC sample frequency			
						Field duplicate	Trip blank	MS/MSD	Equipment blank
TAL Metals – NYSDEC ASP Methods[1] 6010B, 7470A/7471A, 9010B/9014/9012	Biota tissue	plastic zip-loc bags 5 grams	4°C	6 months from VTSR; 26 days from VSTR for mercury	51	1 per 20 samples or 1 per matrix (for less than 20 samples)	NA	1 per 20 samples or 1 per matrix (for less than 20 samples)	NA
	Sediment	4 ounce wide mouth glass container with a Teflon® lined lid			42				1 per event
Total Organic Carbon – Lloyd Kahn Method [2]	Sediment	4 ounce wide mouth glass container with a Teflon® lined lid	4°C	14 days from collection	42	1 per 20 samples or 1 per matrix (for less than 20 samples)	NA	1 per 20 samples or 1 per matrix (for less than 20 samples)	1 per event
AVS / SEM [3] – USEPA Method 821-R-91-100	Sediment	4 ounce wide mouth glass container with a Teflon® lined lid	4°C	14 days from collection	42	1 per 20 samples or 1 per matrix (for less than 20 samples)	NA	1 per 20 samples or 1 per matrix (for less than 20 samples)	1 per event
Methyl Mercury – USEPA Method 1630	Biota tissue	plastic zip-loc bags 5 grams	4°C	26 days from VTSR	51	1 per 20 samples or 1 per matrix (for less than 20 samples)	NA	1 per 20 samples or 1 per matrix (for less than 20 samples)	NA
	Sediment	4 ounce wide mouth glass container with a Teflon® lined lid			42				1 per event
PCBs – NYSDEC ASP Method 8082 [1] using the USEPA Method 3540C Soxhlet extraction	Biota tissue	plastic zip-loc bags 20 grams	4°C	5 days from VTSR to extraction; 40 days from extraction to analysis	51	1 per 20 samples or 1 per matrix (for less than 20 samples)	NA	1 per 20 samples or 1 per matrix (for less than 20 samples)	NA
	Sediment	4 ounce wide mouth glass container with a Teflon® lined lid			42				1 per event

Parameter and critical method	Matrix	Sample containers and mass	Preservation	Holding times	Number of Samples	QC sample frequency			
						Field duplicate	Trip blank	MS/MSD	Equipment blank
Percent Lipids – USEPA Method 3540C Soxhlet extraction	Biota tissue	plastic zip-loc bags 5 grams	4°C	NA	51	1 per 20 samples or 1 per matrix (for less than 20 samples)	NA	1 per 20 samples or 1 per matrix (for less than 20 samples)	NA
SVOCs – NYSDEC ASP Method 8270C [1]	Biota tissue	plastic zip-loc bags 30 grams	4°C	5 days from VTSR to extraction; 40 days from extraction to analysis	51	1 per 20 samples or 1 per matrix (for less than 20 samples)	NA	1 per 20 samples or 1 per matrix (for less than 20 samples)	NA
	Sediment	4 ounce wide mouth glass container with a Teflon® lined lid			42				1 per event
Percent Moisture USEPA Method 160.3	Biota tissue	plastic zip-loc bags 5 grams	4°C	NA	51	1 per 20 samples or 1 per matrix (for less than 20 samples)	NA	1 per 20 samples or 1 per matrix (for less than 20 samples)	NA
	Sediment	4 ounce wide mouth glass container with a Teflon® lined lid			42	1 per 20 samples or 1 per matrix (for less than 20 samples)	NA	1 per 20 samples or 1 per matrix (for less than 20 samples)	NA

NOTES:
1 -NYSDEC ASP references New York State Department of Environmental Conservation *Analytical Services Protocol*, October 1995 Revisions, Albany, New York
2 - USEPA, Region II, Environmental Services Division, Monitoring Management Branch, *Determination of Total Organic Carbon in Sediment, Edison, New Jersey, 1988*
3 - AVS/SEM = acid volatile sulfides / simultaneously extracted metals – used to determine if metals are bioavailable in sediment
MS/MSD = matrix spike/matrix spike duplicate sample
NA = not applicable
PCBs = polychlorinated biphenyls
QC = quality control
SVOCs =semivolatile organic compounds
VTSR = verified time of sample receipt

10. Sampling method requirements

10.1. Sampling procedures

Protocols for the various sampling activities that are described in Addendum C have been incorporated and/or modified from the *1999 Supplemental RI/FS Former IFG Facility and Ley Creek Deferred Media Field Sampling Plan* (1999 FSP). Field methods will be performed in accordance with the applicable GM's Field Method Guidance Nos. FMG 6.2 and 6.7, as applicable.

10.3. Decontamination of sampling equipment

Protocols for the decontamination of sampling equipment are described in detail in Section 4 of the 1999 FSP.

12.1. Analytical methods

Table 12-1. *Analytical methods for parameters*

Sample Type	Parameter	Analytical Method	Method Reference
Biota tissue, sediment	SVOCs	NYSDEC ASP Method 8270C	1
Biota tissue, sediment	PCBs	NYSDEC ASP Method 8082 using USEPA Method 3540C (Soxhlet extraction)	1, 2
Biota tissue	Percent Lipids	USEPA Method 3540C (Soxhlet extraction)	2
Biota tissue, sediment	Methyl mercury	USEPA Method 1630	2
Biota tissue, sediment	TAL Metals	NYSDEC ASP Method 6010B NYSDEC ASP Method 7471A (Mercury) NYSDEC ASP Method 9010B/9012 (Cyanide)	1
Biota tissue, sediment	Percent Moisture	USEPA Method 160.3	2
Sediment	AVS/SEM	USEPA Method 821-R-91-100	2
Sediment	TOC	Lloyd Kahn Method	3

NOTES:
ASP indicates Analytical Services Protocol
AVS/SEM indicates acid volatile sulfides / simultaneously extracted metals
PCBs indicate polychlorinated biphenyls
SVOCs indicate semivolatile organic compounds
TAL Metals indicate the target analyte list metals listed in Table 12-7 of the 1999 WP
TOC indicates total organic carbon
1 = New York State Department of Environmental Conservation *Analytical Services Protocol*, 10/95 Revisions, Albany, New York.
2 = USEPA. 2006. Library Analytical Methods Collection. Environmental Science Library. Accessed at: http://www.epa.gov/Region3/esc/library/methods.htm. Last updated: August 10th, 2006.
3 = USEPA, Region II, Environmental Services Division, Monitoring Management Branch, *Determination of Total Organic Carbon in Sediment*, Edison, New Jersey, 1988.

22. Data validation

Data validation will be performed by Deborah Andrasko of CRA for data generated by Accutest Laboratories.

ADDENDUM B

Health and Safety Plan Modifications

Addendum B: Health and Safety Plan (HASP)

The 1999 *Supplemental Remedial Investigation / Feasibility Study (RI/FS) Former Inland Fisher Guide (IFG) Facility and Ley Creek Deferred Media Final Work Plan* (1999 WP) HASP and 1991 *RI/FS Ley Creek Dredged Material Area Work Plan* HASP will be followed for efforts performed as part of the *Site's Baseline Ecological Risk Assessment – Ley Creek Fish Sampling Work Plan* (2008 WP) with the exception of a few modifications as discussed herein. These modifications address Site-specific sampling efforts as described in the 2008 WP. Sections below refer to the associated section from the 1999 WP HASP.

3.3. Task-specific hazards

The field efforts associated with the risk assessment process include fish and crayfish (biota) tissue and sediment sampling and analysis. Discussion of hazards related to contaminants, as well as safety or physical hazards related to the subject area, or operations and equipment inherent in the task, and the appropriate protective measures is presented below.

Biota tissue sampling
Operations and tasks to be performed: collect fish and crayfish tissue samples from locations as identified on Table 1 and Figures 2 and 3 of the 2008 WP. Backpack electroshocking and seine netting will be performed.

Electrocution and drowning could occur during biota sampling. To prevent electrical shock, all electrical equipment should be carefully inspected before each field operation. Before the sampling begins make sure of the following:

- Electrofishing unit (electrofisher) gives audible sound when voltage is present at anode
- Quick release system is functioning properly
- Tilt switch is functioning properly (turns power off)
- Poles are free of cracks in fiberglass handle
- Use dip-nets with nonconductive handles
- Electrodes are free from corrosion (clean if necessary), Anode does not have netting jury-rigged to ring (a common, ill-advised modification), Cathode is free of wear and burrs and its cable insulation is undamaged
- Power Supply- check all batteries for damage/leakage, disconnect power supply before transporting and when not in use.

A crew leader will be designated for safety reasons. A minimum of a two-person crew is necessary while using the electrofisher. The electrofisher should never be used alone. All crew members should be trained in fundamentals of electricity and safety. One person will be designated to order power of the electrofisher to be turned on and it will be made clear that any member of the crew can order power off. As electrofishing is inherently dangerous, all crew should be alert and attentive; take breaks as necessary. In case of an accident, turn off power to the electrofisher, evaluate the situation and take the appropriate action. Clarify with the entire crew the nearest hospital and evacuation route in case of an accident.

Potential also exists for direct contact with contaminated biota tissue and surface water containing PCBs, SVOCs, and metals during these sampling activities. The contaminants may be absorbed through direct contact with contaminated materials; therefore, Modified Level D protection will be worn as described in Section 4.1 below.

All sampling personnel must be watchful of each other. In the event that an individual falls into the water during electroshocking, one electrode must be removed from the water immediately. Training and medical monitoring, according to CFR 1910.120 Subparts E and F, will be required for this task. Equipment that is potentially contaminated will be cleaned to the satisfaction of the project manager or his/her designated representative.

Sediment sampling
Sediment sampling will be collected using Lexan® tubing and/or shovel/bucket/auger. The potential exists for contact with contaminated sediment and surface water PCBs, SVOCs, and metals during sediment sampling activities. The contaminants may be absorbed through direct contact with contaminated materials; therefore, Modified Level D protection will be worn as described in Section 4.1 below.

Following each use, non-dedicated sediment sampling equipment will be decontaminated using decontamination procedures outlined in Section 4.2 of the 1999 WP Field Sampling Plan.

4.1. Personal protective equipment (PPE) selection

Personal protective equipment is selected to protect employees from identified and suspected/potential hazards, which they are likely to encounter during this sampling event. Selection is based on the performance characteristics of the PPE, the site conditions, the task-specific conditions and duration, and the hazards involved. Selection and use of PPE will also meet the requirements of 29 CFR 1910, Subpart I, in addition to the requirements of 29 CFR 1910.120. General levels of protection, known as Levels A, B, C and D are described in Attachment B of the 1999 WP HASP.

For this project, field investigation personnel shall wear Modified Level D protection to include non-breathable chest waders or hip boots with non-slip soles (while in water), steel toe boots (out of water), Lineman electrical gloves rated and tested at a minimum of 1,000 volts, nitrile gloves while performing sediment sampling, and eye protection. A first aid kit will be available on-site. Hearing protection, if necessary, will be available to be worn during operation of heavy equipment, if any.

In accordance with Section 2.53 of the O'Brien & Gere's Corporate Health & Safety Manual, Personal Floatation Devices (PFDs), such as life jackets or buoyant work vests, will be readily available to personnel performing sampling in surface water. PFDs require the following:

- Approval by the U.S. Coast Guard
- Inspection for defects before and after each use by the employee (defective PFDs will not be used)
- Immediate availability at locations where employees are working over or adjacent to water.

ADDENDUM C

Field Sampling Plan Modifications

Addendum C: Field Sampling Plan (FSP)

The 1999 Supplemental Remedial Investigation / Feasibility Study (RI/FS) Former Inland Fisher Guide (IFG) Facility and Ley Creek Deferred Media Final Work Plan (1999 WP) FSP will be followed for efforts performed as part of the Baseline Ecological Risk Assessment – Ley Creek Fish Sampling Work Plan (2008 WP) with the exception of a few modifications as discussed herein. These modifications address Site-specific sampling procedures as described in the 2008 WP. Field sampling will be performed in accordance with GM's Field Method Guidance Nos. FMG 6.2 and 6.7, as applicable.

2.3. Sampling equipment

The following is a general list of equipment necessary for sample collection:

- Digital camera to document sampling procedures and locations
- Global Positioning System (GPS) unit to record sampling locations
- Stainless steel spoons and bowls for homogenizing sediment samples
- Lexan® tubing
- Sediment core extraction sampling unit
- Stainless steel shovel, bucket auger
- Seining nets
- Minnow traps
- Electrofishing backpack unit and associated equipment
- High voltage rated rubber gloves
- Neoprene waders
- Canoe or row boat for equipment storage
- Wood-handled dip nets
- Fillet knife, scaling tool
- Mass and length scales
- Aluminum foil
- Nitrile gloves
- Re-sealable plastic bags
- Portable field instruments, including a pH meter, dissolved oxygen meter, turbidity meter, thermometer, conductivity meter (all measured by using a Horiba U-10 or equivalent unit)
- Sample containers (kept closed and in the laboratory-shipped coolers until the samples are collected)
- Reagent-grade preservatives and pH paper or meter (or pre-preserved sample containers) for aqueous samples
- Chain-of-Custody labels, tags, seals, and shipping forms
- Log book, field sampling data sheets, and indelible ink markers
- Laboratory grade decontamination soaps (such as Alconox), reagent-grade solvents and distilled water to be used for decontaminating equipment between sampling stations
- Decontamination chemicals (*i.e.*, nitric or hydrochloric acid, distilled water, acetone or methanol)
- Buckets, wash basins, and scrub brushes to be used for decontaminating equipment
- Packing/shipping material for sample bottles
- Strapping tape, clear plastic tape, duct tape.

3. Field instruments

Field analytical equipment that requires field calibration will be calibrated immediately prior to each day's use and more frequently if required. The calibration procedures will conform to manufacturer's standard instructions. This calibration will be conducted such that the equipment is functioning within the allowable tolerances established by the manufacturer and required by the project. Equipment requiring field calibration include the pH meter, specific conductivity meter, dissolved oxygen meter, thermometer and turbidity meter, which can be measured by using a Horiba U-10 or equivalent unit. Records of instrument calibration will be maintained by the Field Manager and will be subject to audit by the Quality Assurance Officer. Copies of the instrument manuals will be maintained by the Field Manager.

4.2. Decontamination of sampling equipment

Procedures for decontaminating the sampling equipment are described in the associated Section 4.2 of the 1999 FSP.

12. Biota tissue and sediment sampling

For each biota tissue and sediment sample collected, field notes will be taken by the field crew to provide a detailed description of the sampling event. Additionally, a photo log of the sampling locations will be maintained. Field notes for each sampling event will be recorded in a field logbook and will contain the following information:

- location
- date and time
- weather conditions
- physical characteristics of sample area
- water depth
- sampler's names
- sampling equipment utilized
- additional comments as appropriate.

12.1 Biota tissue sampling

Fish and crayfish are considered receptors of concern because they are a major component of the aquatic food web and, in addition, people fishing in Ley Creek can potentially consume them. The sampling objective for the BERA is to collect additional fish and crayfish tissue data, for which whole-body samples will be analyzed for PCBs, percent lipids, as well as the additional COCs specified in the Table 3 of the 2008 WP. Whole-body samples will consist of all body parts, including skin, scales, and shells (for crayfish only). For the HHRA, the objective is to collect edible fish fillets, which are the likely body component that potentially will be consumed by humans. In accordance with NYSDEC guidance, standard skin-on fillets (scale-less) will be collected and analyzed for constituents specified in Table 3 of the 2008 WP. Bullhead and catfish species are an exception, as their skins will be removed from the fillets. Details concerning the tasks to be conducted for the fish tissue investigation are presented below.

In-field water quality measurements

Water quality measurements will be collected at each biota sample location during this field effort. Temperature, specific conductivity, pH, dissolved oxygen, and turbidity will be evaluated using direct-reading instrumentation at the same time and location of the biota sampling. Direct-reading instrumentation to be used for the in-field tests will provide real-time measurements of the aforementioned parameters. The Horiba U-10, or an equivalent direct-reading meter, will be utilized. Measurements are collected by submerging the sensing probe into the water column at the sampling location and recording the output on the meter's display. Calibration of the water

quality meter will be conducted in accordance with the manufacturer's specifications and as presented in Section 3 above.

Biota sampling procedures

Biota tissue samples will be collected prior to sediment samples to prevent disruption of the fish species and to improve fish collection success. Biota sample locations are described in and shown on Figures 2 and 3 of the 2008 WP. Biota sample locations will be recorded using a GPS unit and/or flagged on the bank of Ley Creek for subsequent surveying of locations.

For this assessment, O'Brien & Gere will attempt to collect fish and crayfish from the Ley Creek study area as well as from areas upstream of the study area. The upstream locations will be selected a significant distance away from the study area to minimize the collection of individuals that may frequent the study area portion of the creek. The biota sampling success will be dependent on the techniques employed and the natural conditions that are present at the time and season of the sampling effort. The primary sampling method will be backpack electroshocking. Seine nets and wire minnow traps will also be utilized, if necessary, to supplement the electroshocking efforts. An attempt will be made to collect crayfish from Ley Creek via baited minnow traps and dip-netting.

The following procedures will be utilized for the collection of biota tissue from the sampling locations identified at the Site.

1. Cover hands with protective disposable gloves and don chemical-resistant waterproof boots or waders if wading into the creek is required.
2. Place labeled sample containers near the sampling location.
3. One biologist will wear a backpack electroshocking unit and traverse the length of the Ley Creek study area starting at the furthest downstream location. The unit will transmit an electric pulse in to the water stunning the fish within the immediate area. The stunned fish will then float to surface.
4. Additional biologists will collect the fish with wooden-handled dip nets. High voltage-rated rubber gloves and non-breathable chest waders will be worn by each biologist.
5. If necessary, seining will be performed at select locations within the creek and multiple "Gee" minnow traps will be placed at various locations of Ley Creek study area during the extent of the sampling event. The traps will be checked twice a day.
6. Collected fish and/or crayfish will be containerized in plastic bags, labeled per location, and placed on ice until sample processing on shore.
7. On shore, fish will be identified to species, weighed, measured and separated into BERA (whole body) and HHRA (fillet and remains) sampling groups. The HHRA fish are then filleted in accordance with NYSDEC methodology. Fish remains are retained and bagged separately from fillets for independent analysis.
8. Begin the chain-of-custody record.
9. Preserve samples in a cooler with ice prior to shipment to the laboratory. Ship samples within 48 hours or as specified in the QAPP.
10. Decontaminate the sampling equipment in accordance with Section 4.2 of the 1999 FSP.

Biota tissue preparation

The following fish and crayfish tissue preparation methods for ecological and human health assessments are referenced from the NYSEDC *2002 Draft Procedures for Collection and Preparation of Aquatic Biota for Contaminant Analysis.*

Ecological assessment – fish and crayfish whole body analysis
Fish and crayfish should be analyzed whole to determine contaminant concentrations for risks to fish and wildlife. Do not eviscerate or remove the head, skin or scales before compositing. Fish should be chopped and homogenized whole.

Human health assessment - procedures for standard filleting
The standard fillet is the portion of edible fish analyzed for the purpose of obtaining information regarding human health risks. The methodology is slightly modified from the U.S. Food and Drug Administration procedures.

1. Remove scales from fish, but do not remove the skin. Scales will be saved and included with the fish remains analysis.
2. Make a cut along the ventral midline of the flesh from the vent to the base of the jaw.
3. Make a diagonal cut from the base of the cranium following just behind the gill to the ventral side just behind the pectoral fin.
4. Remove the flesh and the ribcage from one-half of the fish by cutting from the cranium along the spine and dorsal rays to the caudal fin.
5. Score the skin and homogenize the entire fillet.

Some fish are too small to fillet by the above procedure. Fish less than approximately 6 inches long and rainbow smelt are prepared by cutting the head off from behind the pectoral fin and eviscerating the fish. Ensure that the belly flap is retained on the carcass to be analyzed. When this modification is used, it should be noted when reporting analytical results.

Some species are generally eaten by skinning the fish. The skin from these species is also difficult to homogenize in the sample. For bullhead and catfish, remove the skin prior to filleting.

12.2. Sediment sampling
Sediment samples will be collected in conjunction with the biota sampling effort. The objectives of this sample collection are three fold:

1. Sediment collected from the 0 to 6 inch interval will be evaluated with respect to biota tissue concentrations and used for calculation of an exposure point concentration for incidental ingestion in the food chain model
2. Sediment collected from intervals below 6 inches will be used to further characterize the nature and extent of affected sediment in Ley Creek
3. Sediment samples from upstream reaches of the creek will be collected to make statistical comparisons to analytical results and conditions from Site-impacted areas.

Table 2 of the 2008 WP summarizes the sediment sampling scope. Up to 12 locations will be selected for sampling in the Site and Downstream reaches. This equates to approximately one sample location per 750 feet of creek reach. Samples will be collected from the 0 to 6 inch and, unless refusal occurs, 6 to 12 inch intervals. Sediment core locations will be recorded using a GPS unit and/or flagged on the bank of Ley Creek for subsequent surveying of locations.

Initial priority will be given to depositional area locations adjacent to biota collection locations. Following biota collection, remaining locations will be selected with bias toward the same general location as the 1998 Ley Creek sediment samples. This sampling strategy will allow for a more recent characterization of the nature and extent of affected sediment as well as a comparison with the 1998 Ley Creek sediment samples.

Additionally, three locations will be sampled in each of the three Upstream Study Areas. As outlined above, sample collection will occur in areas where biota are collected. Supplemental locations will be selected, if necessary, to coincide with historical samples.

Sediment samples will be analyzed for constituents identified as BERA and HHRA COCs. Tables 3 and 4 of the 2008 WP present the tissue and sediment analytical constituents, respectively. Table 5 of the 2008 WP presents the respective analytical parameters.

The procedures listed below will be utilized while collecting sediment cores from the sampling locations identified at the Site. If the depth of the substrate does not allow the use of the coring methodology (*e.g.*, less than 6 inches), and creek flow will allow collection of an undisturbed sample, then a stainless steel shovel, bucket auger, spoon and mixing bowl will be used in lieu of the Lexan® tubing for sediment sample collection. Compositing of multiple core samples of corresponding depth will be conducted for relatively large depositional areas. A clean, stainless steel bowl will be used for homogenization of the sub-samples.

1. Cover hands with protective disposable gloves.
2. Lower a clean, 2 inch (outside diameter) section of Lexan® into the creek and gently hammer the tube through the substrate until refusal.
3. Cover the top of the Lexan® tube with an appropriate cap and slowly extract the tube from the substrate.
4. Before the bottom of the core tube breaks the water surface and while maintaining the core in a vertical position, install a clean cap on the bottom of the core tube to prevent loss of the sample from the tube.
5. Transport the core to an appropriate processing station for core sectioning, maintaining the core tube in a vertical position. The shore, if appropriate, or the laboratory will be used as the processing station.
6. At the processing station, remove the top cap of the core tube and siphon off the water overlying the sediment core, taking care not to remove any sediment.
7. Separate the core sample into 6 inch sections by inserting a piston into the bottom of the core tube and pushing the sample out of the top end of the core tube. Cut the 6-inch sections from the extruded sample with a clean metal putty knife and place into the appropriate sample containers, as defined in the QAPP.
8. In addition to the required information discussed herein, record the depth to tube refusal, core sample composition and length of section, if less than 6 inches.
9. Rinse the Lexan® core tube with creek water and place on shore for subsequent disposal.
10. Begin the chain-of-custody record.
11. Preserve samples in a cooler with ice prior to shipment to the laboratory within 48 hours or as specified in the QAPP.
12. Prepare clean sampling apparatus for the next discrete core sample.

ATTACHMENT B

New York State Department of Environmental Conservation
Division of Fish, Wildlife and Marine Resources - Special Licenses Unit
625 Broadway
Albany, NY 12233-4752
Phone Number (518) 402-8985
Fax Number: (518) 402-8925

NEW YORK STATE FISH AND WILDLIFE LICENSE

License Type: Collect or Possess

License Number: 1155

Licensee:

STEPHEN E MOONEY
O'BRIEN & GERE
5000 BRITTONFIELD PKWY, PO BOX 4873
SYRACUSE, NY 13221

Fee Amount: $10.00
Effective Date: 07/03/2007
Expiration Date: 07/31/2008
Region: 7 County: ONONDAGA
Home Phone Number: (315) 447-9733
Business Phone Number: (315) 437-6100

DOB: 1/10/1963

Statutory Authority:

ECL 11-0515 6NYCRR Part 175

Conditions:

1. A. Please read all license conditions BEFORE conducting any activity pursuant to this license.

   B. The licensee assumes all liability and responsibility for any activities conducted under the authority of this license or any actions resulting from activities authorized by the license.

   C. This license may be revoked for any of the following reasons:
   i. licensee provided materially false or inaccurate statements in his or her application, supporting documentation or on required reports;
   ii. failure by the licensee to comply with any terms or conditions of this license;
   iii. licensee exceeds the scope of the purpose or activities described in his or her application for this license;
   iv. licensee fails to comply with any provisions of the NYS Environmental Conservation Law, any other State or Federal laws or regulations of the Department directly related to the licensed activity;
   v. licensee submits a check, money order or voucher for this license or application for this license that is subsequently returned to the Department for insufficient funds or nonpayment after the license has been issued.

   D. The renewal of this license is the responsibility of the licensee. This license is deemed expired on the date of expiration listed on the license unless otherwise notified by the Department.

   E. Direct all questions concerning this license to the Special Licenses Unit (518) 402-8985.

2. A. No endangered/threatened species may be collected or possessed pursuant to this license.

New York State Department of Environmental Conservation
Division of Fish, Wildlife and Marine Resources - Special Licenses Unit
625 Broadway
Albany, NY 12233-4752
Phone Number (518) 402-8985
Fax Number: (518) 402-8925

NEW YORK STATE FISH AND WILDLIFE LICENSE

Conditions:

3. A. The licensee and/or designated agents are authorized to collect and possess the following fish species fro Ley Creek in Onondaga county for scientific purposes:
White sucker (Catostomus commersoni)
Common carp (Cyprinus carpio)
Gizzard shad (Dorosoma cepedianum)
Stickleback (Gasterosteus spp.)
Brown bullhead (Ictalurus nebulosus)
Pumpkinseed (Lepomis gibbosus)
Bluegill (Lepomis macrochirus)
Golden shiner (Notemigonus crysoleucas)
Longnose dace (Rhinichtys cataractae)

B. Up to 20 individuals per species may be retained for further analysis. All other specimens shall be returned to Ley Creek at the point of capture.

C. Fish may be collected pursuant to this license by backpack electroshocking, seine net, or placement of "GEE" minnow.

D. The licensee may designate agents to conduct activities authorized by this license. Such designations must be in writing and the licensee must maintain an accurate list of agents he or she designates when conducting activities pursuant to this license.

E. The licensee must submit and maintain an accurate written list of agents to the NYS DEC Special Licenses Unit BEFORE such agents conduct any activity pursuant to this license.

F. The licensee is responsible for all actions taken by his or her designated agents pursuant to this license.

G. This license is not a license to trespass. The licensee and his or her designated agents must obtain permission from the appropriate landowner/land manager prior to conducting activities authorized pursuant to this license.

H. The licensee and/or designated agents must notify the appropriate Regional Environmental Conservation Officer at least 48 hours prior to conducting any collecting activity under this license, (315) 426-7431.

I. The licensee shall file with the department on or before February 1 a report of activities conducted under this license during the preceding calendar year.

O'BRIEN & GERE

June 8, 2007

Special Licenses Unit
Division of Fish and Wildlife
New York State Department of Environmental Conservation
625 Broadway
Albany, NY 12233-4752

Re: GM Former IFG Facility and Ley Creek Deferred Media Site Collection License Application

File: 4966 / 34128 / #2

To Whom It May Concern:

Please find enclosed a completed application for a License to Collect or Possess and check (No.216) for the associated application fee. The permit is necessary for O'Brien & Gere personnel to collect fish from Ley Creek, which is associated with the General Motors Corporation (GM) Former Inland Fisher Guide (IFG) and Ley Creek Deferred Media Site, located in Syracuse, New York. The purpose of the fish collection is to assess if chemical constituents previously identified in the sediment of Ley Creek are bioaccumulating in fish that inhabit the creek. A supplemental information sheet and figures depicting the sample areas are attached to the application.

O'Brien & Gere has been contracted by GM to perform a Baseline Ecological Risk Assessment (BERA) at the site. The proposed fish sample collection efforts will be conducted in accordance with approved written plans and verbal agreements between O'Brien & Gere and GM representatives. Sample collection is scheduled to begin in early August of 2007; therefore, your prompt attention to this matter is greatly appreciated.

Thank you for your consideration in this matter. Feel free to call me at 315-437-6100 ext. 2717 with any questions you may have.

Very truly yours,

O'BRIEN & GERE ENGINEERS, INC.

Stephen E. Mooney
Project Associate

Enclosures

cc: James F. Hartnett – GM
Clare F. Leary – O'Brien & Gere

LCP

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF FISH, WILDLIFE AND MARINE RESOURCES - SPECIAL LICENSES
625 BROADWAY, ALBANY, NEW YORK 12233-4752

LICENSE TO COLLECT OR POSSESS APPLICATION

Please Refer to the Instructions Before Completing This Application.
(Please Print or Type)

Fee: $10.00

1. Applicant Last Name	First Name	M.I.
Mooney	Stephen	E.

2. Business/Organization Name (if applicable)
O'Brien & Gere Engineers, Inc.

3. Street 1	4. Telephone # (Day)
5000 Brittonfield Parkway	(315) 437-6100
Street 2	**Telephone # (Night)**
P.O. Box 4873	(315) 447-9733

City/Town	State	Zip Code (Zip + 4)
Syracuse	NY	13221

County	5. Date of Birth
Onondaga	01/10/63

FOR OFFICIAL USE ONLY

License Number _____

Effective Date _____

Expiration Date _____

Region _____

6. This Application is For a:

☒ New Application ☐ Renewal of Current License WITHOUT Change ☐ Renewal of Current License WITH Change

7. Describe, in detail, your purpose for which you applying for this license:

See attached Supplemental Information.

(If more space is needed, attach additional sheets)

8. List the species and number you wish to collect or possess:

	COMMON NAME	SCIENTIFIC NAME	TOTAL Male	TOTAL Female
a.	See attached Supplemental Information		X	X
b.				
c.				
d.				
e.				

(If more space is needed, attach additional sheets)

9. Check the appropriate category:

☒ Species will be collected from the wild in New York State. ☐ Species will NOT be collected from the wild in New York State.

10. If you WILL NOT be collecting species from the wild in New York State, describe how you will obtain the species you list in Question 8:

Not applicable.

(If more space is needed, attach additional sheets)

- Continued On Next Page -

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF FISH, WILDLIFE AND MARINE RESOURCES - SPECIAL
625 BROADWAY, ALBANY, NEW YORK 12233-4752

LICENSE TO COLLECT OR POSSESS APPLICATION

Continued

Answer Questions 11 through 13 ONLY if you WILL be collecting from the wild of New York State

11. Describe the methods that you will be employing to collect the species listed in Question 8:

Fish will be collected by backpack electroshocking, 10 feet seine netting, and/or placement of "GEE" minnow.

(If more space is needed, attach additional sheets)

12. List the locations where you wish collect the species listed in Question 8:

The sampling will be performed within the reach of Ley Creek located between Townline Road and Route 22 (see attached figure).

(If more space is needed, attach additional sheets)

13. List the time periods when you will make your collections:

Fish will be collected during the daylight hours of a 3 day sampling event scheduled for sometime between July 15 and September 15, 2007.

(If more space is needed, attach additional sheets)

14. Describe the final disposition of the species you wish to collect:

Target species of fish will be submitted to an analytical laboratory for whole body tissue analysis for chemical constituents up to 20 samples will be submitted to the laboratory. Non-target organisms collected will be returned to the creek unharmed.

(If more space is needed, attach additional sheets)

15. Do you wish to designate agents, under your license, to assist you in making collections?

☒ Yes ☐ No If YES, Please attach a list with the names and addresses of each agent to the application.

16. Do you possess valid State and/or Federal Licenses or permits which relate to your proposed activity?

☐ Yes ☒ No If YES, Please attach photocopies of relevant licenses or permits to the application.

Make Check or Money Order Payable to:

New York State Department of Environmental Conservation *DO NOT send cash.

NOTICE: Pursuant to ECL Section 3-0301(2)(Q) False statements made on this application are punishable pursuant to Section 210.45 of the New York State Penal Code.

6/11/7
Date

Signature of Applicant

RETURN THE COMPLETED APPLICATION (BOTH SHEETS) AND ANY ADDITIONAL SHEETS, TO THE ADDRESS AT THE TOP

Supplemental Information for NYSDEC License to Collect or Possess Application

#7. (continued):

The Site consists of the Former IFG Facility and the Ley Creek Deferred Media. The Site is classified as a Class 2 site on NYSDEC's Registry of Inactive Hazardous Waste Disposal Sites (Site No. 7-34-057). The Site is also designated as a sub-site of the Onondaga Lake National Priorities List (NPL) site by NYSDEC and the United States Environmental Protection Agency (USEPA). The Former IFG Facility comprises approximately 65 acres of property located at 1 General Motors Drive in the Town of Salina, Onondaga County, New York (Figure 1). The Ley Creek Deferred Media consist of ground water beneath the Ley Creek PCB Dredging Site, and surface water and sediment of Ley Creek between Townline Road and Route 11 (Figure 1).

The purpose of the fish sampling in Ley Creek is to assess if chemical constituents previously identified in the sediment of the creek are bioaccumulating in fish that inhabit the creek. The sampling is being conducted to collect additional data for use in the Baseline Ecological Risk Assessment (BERA) process. Therefore, at least 20 samples will be collected for chemical whole-body tissue analysis. The samples will be analyzed for PCBs as well as the additional analytes identified at the site.

#8. (continued):

Various species of fish may be collected from the creek, but individuals representing the highest trophic level and ranging in size from approximately 2 to 15 inches will be targeted for collection. For reference, the fish species below have been collected from Ley Creek as part of previous sampling efforts conducted in 1985 and 1992. As 100 grams is required, it is anticipated that no more than 15 individuals will be possessed per sample. Approximately 20 samples will be submitted for analysis. Endangered, threatened or species of special concern will not be collected or possessed.

Scientific Name	Common Name
Catostomus commersoni	White sucker
Cyprinus carpio	Common carp
Dorosoma cepedianum	Gizzard shad
Gasterosteus sp.	Stickleback species
Ictalurus nebulosus	Brown bullhead
Lepomis gibbosus	Pumpkinseed
Lepomis macrochirus	Bluegill
Notemigonus crysoleucas	Golden shiner
Rhinichthys cataractae	Longnose dace

#15 (continued):

The following individuals are designated as agents to assist in the sampling to be conducted under this license:
Ms. Abby Morton
Mr. Ronald Chiarello
Mr. Kyle Buelow
Ms. Samantha Wason
Mr. Lyle Trumbull
Mr. Chris Kriegner

The associated address for these individuals is also 5000 Brittonfield Parkway, East Syracuse, NY 13057.

Syracuse Main Plant RI/FS Program Distribution List - Government Agencies

1 copy (or 5 copies if plan or report -
1 unbound and 1 on computer diskette):

Susan Edwards
NYSDEC Project Manager
Remedial Bureau D
NYS Department of Environmental Conservation
625 Broadway, 12th Floor
Albany, New York 12233-7016

---

1 copy of correspondence (Report cover letters only):

Donald Hesler
NYS Department of Environmental Conservation
625 Broadway, 12th Floor
Albany, New York 12233-7016

---

1 copy:

Mark Van Valkenburg
Bureau of Environmental Exposure Investigation
New York State Department of Health
Flanigan Square
547 River Street, Room 300
Troy, New York 12180-2216

---

1 copy:

Henriette M. Hamel, R.S.
New York State Department of Health
Syracuse Field Office
217 S. Salina St., 3rd Floor
Syracuse, New York 13202-3952

---

1 copy (or 2 copies if plan or report):

Regional Director, Region 7
NYS Department of Environmental Conservation
615 Erie Blvd. West
Syracuse, New York 13204-2400

---

1 copy (excluding plans or reports):

George A. Shanahan, Esq.
Assistant Regional Counsel
U.S. Environmental Protection Agency, Region II
290 Broadway
New York, New York 10007-1866

---

1 copy (or transmittal letter only if plan or report):

Margaret A. Sheen, Esq.
NYS Department of Environmental Conservation
615 Erie Boulevard West
Syracuse, New York 13204
315-426-7405 315-426-7408

---

1 copy (2 copies if HHRA submittal or 3 copies if BERA submittal):

Patricia Simmons Pierre, RPM
Central New York Remediation Section
NY Remedial Branch
U.S. Environmental Protection Agency, Region II
290 Broadway, 20th Floor
New York, New York 10007-1866

Syracuse Main Plant RI/FS Program Distribution List - GM Team

William J. McFarland	GM WFG-Remediation Team Pontiac Centerpoint Campus – Central 2000 Centerpoint Parkway Mailcode: 483-520-190 Pontiac, MI 48341-3147
Thomas L. Arnett, Esq.	General Motors Corporation Legal Staff Mail Code 482-C24-D24 300 Renaissance Center Detriot, MI 48243
James F. Hartnett	General Motors Corporation - Remediation Team Remediation Project Office One General Motors Drive STE2 Syracuse, NY 13206-1127 Phone: 315-463-2391 Fax: 315-482-5197
Doug Crawford Maureen Markert Clare Leary	O'Brien and Gere Engineers Inc. 5000 Brittonfield Parkway P.O. Box 4873 Syracuse, NY 13221 Phone: 315-437-6100 Fax: 315-637-7554
Barry R. Kogut, Esq.	Bond, Schoeneck and King, LLP One Lincoln Center Syracuse, New York 13202-1355 Phone: 315-422-0121 Fax: 315-422-3598