UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 1
5 Post Office Square, Suite 100
BOSTON, MA 02109-3912

CERTIFIED MAIL RETURN RECEIPT REQUESTED

SEP 02 2014

Brian Postale
Manager of Safety and Workers Compensation
Wyman-Gordon Company
244 Worcester Street
Grafton, MA 01536

Re: Authorization to discharge under the Remediation General Permit (RGP) – MAG910000. Wyman-Gordon Company site located at 244 Worcester Street, Grafton, MA 01536, Worcester County; Authorization # MAG910635

Dear Mr. Postale:

Based on the review of a Notice of Intent (NOI) submitted by GZA Geoenvironmental, Inc., on behalf of Wyman-Gordon (W-G), for the site referenced above, the U.S. Environmental Protection Agency (EPA) hereby authorizes you, the Owner's representative and the Operator, to discharge in accordance with the provisions of the RGP at that site. Your authorization number is listed above.

The checklist enclosed with this RGP authorization indicates the pollutants which you are required to monitor. Also indicated on the checklist are the effluent limits, test methods and minimum levels (MLs) for each pollutant. Please note that the checklist does not represent the complete requirements of the RGP. Operators must comply with all of the applicable requirements of this permit, including influent and effluent monitoring, narrative water quality standards, record keeping, and reporting requirements, found in Parts I and II, and Appendices I – VIII of the RGP. See EPA's website for the complete RGP and other information at: http://www.epa.gov/region1/npdes/mass.html#dgp.

Please note the enclosed checklist includes parameters that exceeded Appendix III limits. The checklist also includes other parameters for which your laboratory reports indicated there was insufficient sensitivity to detect these parameters at the minimum levels established in Appendix VI of the RGP, and other parameters based on historic contamination at the existing wetland adjacent to the site designated as the W-G West Side area.

The clean-up effort is expected to last three months or less, it is understood that Mass DEP and U.S. EPA representatives will be present at the site during the clean-up activity to provide technical assistance if needed.

Also, please note that the metals included on the checklist are dilution dependent pollutants and subject to limitations based on a dilution factor range (DFR). With the limited dilution to Bonny Brook, EPA determined that the DFR for each parameter is in the one and five (1-5) range. (See the RGP Appendix IV for Massachusetts facilities) Therefore, the limits for antimony of 7.56 ug/L, arsenic of 13.5 ug/L, cadmium of 0.27 ug/L, trivalent chromium of 65.88 ug/L, copper of 7.02 ug/L, lead of 1.75 ug/L, nickel of 39.15 ug/L, selenium of 6.75 ug/L, zinc of 89. 9 ug/L and iron of 1,350 ug/L, are required to achieve permit compliance at your site. Please note that these metal limitations have increased dilution factor range. The reason for the increase has to do with the new RGP regulations which allows for a limit increase based on the metal limit times the available dilution of the receiving stream not to exceed 5. The available dilution in this case is 1.35. See footnote eleven at the end of the "Summary of Monitoring Parameters" listed below for further explanation.

This general permit and authorization to discharge will expire on September 9, 2015. You have reported that this project will terminate on December 1, 2014. You are required to submit a Notice of Termination (NOT) to the attention of the contact person indicated below within 30 days of project completion.

Thank you in advance for your cooperation in this matter. Please contact Victor Alvarez at 617-918-1572 or Alvarez.Victor@epa.gov, if you have any questions.

Sincerely,

Thelma Murphy, Chief
Storm Water and Construction
Permits Section

Enclosure

cc: Robert Kubit, MassDEP
Jeffrey Chormann, MassDEP
Paul Vigeant, MassDEP
Linda Dettloff, Grafton Conservation Commission
Frank Battaglia, US. EPA
Timothy L. Briggs, GZA Geoenvironmental

2010 Remediation General Permit
Summary of Monitoring Parameters[1]

NPDES Authorization Number:	**MAG910635**
Authorization Issued:	August, 2014
Facility/Site Name:	Wyman-Gordon Company
Facility/Site Address:	244 Worcester Street, Grafton, MA 01536
	Email address of owner: bpostale@wyman.com
Legal Name of Operator:	Wyman-Gordon Company
Operator contact name, title, and Address:	Brian Postale, Manager of Safety and Workers Compensation 244 Worcester Street, Grafton, MA 01536, Worcester County
	Email: Same as the Owner.
Estimated date of the site's clean-up Completion:	December1, 2014
Category and Sub-Category:	Category II- Non Petroleum Site Remediation. Subcategory B. VOC Sites with Additional Contamination.
RGP Termination Date:	September 10, 2015
Receiving Water:	Bonny Brook-

Monitoring & Limits are applicable if checked. All samples are to be collected as grab samples

	Parameter	**Effluent Limit/Method#/ML** (All Effluent Limits are shown as Daily Maximum Limit, unless denoted by a **, in that case it will be a Monthly Average Limit)
√	1. Total Suspended Solids (TSS)	30 milligrams/liter (mg/L) **, 50 mg/L for hydrostatic testing ** Me#160.2/ML5ug/L
√	2. Total Residual Chlorine (TRC) [1]	Freshwater = 11 ug/L ** Saltwater = 7.5 ug/L **/ Me#330.5/ML 20ug/L
√	3. Total Petroleum Hydrocarbons (TPH)	5.0 mg/L/ Me# 1664A/ML 5.0mg/L
√	4. Cyanide (CN) [2, 3]	Freshwater = 5.2 ug/l ** Saltwater = 1.0 ug/L **/ Me#335.4/ML 10ug/L
	5. Benzene (B)	5ug/L /50.0 ug/L for hydrostatic testing only/ Me#8260C/ML 2 ug/L
	6. Toluene (T)	(limited as ug/L total BTEX)/ Me#8260C/ ML 2ug/L
	7. Ethylbenzene (E)	(limited as ug/L total BTEX) Me#8260C/ ML 2ug/L
	8. (m,p,o) Xylenes (X)	(limited as ug/L total BTEX) Me#8260C/ ML 2ug/L

	Parameter	Effluent Limit/Method#/ML (All Effluent Limits are shown as Daily Maximum Limit, unless denoted by a **, in that case it will be a Monthly Average Limit)
√	9. Total Benzene, Toluene, Ethyl Benzene, and Xylenes (BTEX) [4]	100 ug/L/ Me#8260C/ ML 2ug/L
	10. Ethylene Dibromide (EDB) (1,2- Dibromoethane)	0.05 ug/l/ Me#8260C/ ML 10ug/L
	11. Methyl-tert-Butyl Ether (MtBE)	70.0 ug/l/Me#8260C/ML 10ug/L
	12.tert-Butyl Alcohol (TBA) (TertiaryButanol)	Monitor Only(ug/L)/Me#8260C/ML 10ug/L
	13. tert-Amyl Methyl Ether (TAME)	Monitor Only(ug/L)/Me#8260C/ML 10ug/L
	14. Naphthalene [5]	20 ug/L /Me#8260C/ML 2ug/L
√	15. Carbon Tetrachloride	4.4 ug/L /Me#8260C/ ML 5ug/L
√	16. 1,2 Dichlorobenzene (o-DCB)	600 ug/L /Me#8260C/ ML 5ug/L
√	17. 1,3 Dichlorobenzene (m-DCB)	320 ug/L /Me#8260C/ ML 5ug/L
√	18. 1,4 Dichlorobenzene (p-DCB)	5.0 ug/L /Me#8260C/ ML 5ug/L
√	18a. Total dichlorobenzene	763 ug/L - NH only /Me#8260C/ ML 5ug/L
√	19. 1,1 Dichloroethane (DCA)	70 ug/L /Me#8260C/ ML 5ug/L
√	20. 1,2 Dichloroethane (DCA)	5.0 ug/L /Me#8260C/ ML 5ug/L
√	21. 1,1 Dichloroethene (DCE)	3.2 ug/L/Me#8260C/ ML 5ug/L
√	22. cis-1,2 Dichloroethene (DCE)	70 ug/L/Me#8260C/ ML 5ug/L
√	23. Methylene Chloride	4.6 ug/L/Me#8260C/ ML 5ug/L
√	24. Tetrachloroethene (PCE)	5.0 ug/L/Me#8260C/ ML 5ug/L
√	25. 1,1,1 Trichloro-ethane (TCA)	200 ug/L/Me#8260C/ ML 5ug/L
√	26. 1,1,2 Trichloro-ethane (TCA)	5.0 ug/L /Me#8260C/ ML 5ug/L
√	27. Trichloroethene (TCE)	5.0 ug/L /Me#8260C/ ML 5ug/L
√	28. Vinyl Chloride (Chloroethene)	2.0 ug/L /Me#8260C/ ML 5ug/L
√	29. Acetone	Monitor Only(ug/L)/Me#8260C/ML 50ug/L
√	30. 1,4 Dioxane	Monitor Only /Me#1624C/ML 50ug/L
√	31. Total Phenols	300 ug/L Me#420.1&420.2/ML 2 ug/L/ Me# 420.4 /ML 50ug/L
√	32. Pentachlorophenol (PCP)	1.0 ug/L /Me#8270D/ML 5ug/L,Me#604 &625/ML 10ug/L
√	33. Total Phthalates (Phthalate esters) [6]	3.0 ug/L ** /Me#8270D/ML 5ug/L, Me#606/ML 10ug/L& Me#625/ML 5ug/L
√	34. Bis (2-Ethylhexyl) Phthalate [Di- (ethylhexyl) Phthalate]	6.0 ug/L /Me#8270D/ML 5ug/L,Me#606/ML 10ug/L & Me#625/ML 5ug/L

	Parameter	Effluent Limit/Method#/ML (All Effluent Limits are shown as Daily Maximum Limit, unless denoted by a **, in that case it will be a Monthly Average Limit)
	35. Total Group I Polycyclic Aromatic Hydrocarbons (PAH)	10.0 ug/L
√	a. Benzo(a) Anthracene [7]	0.0038 ug/L /Me#8270D/ ML 5ug/L, Me#610/ML 5ug/L& Me#625/ML 5ug/L
√	b. Benzo(a) Pyrene [7]	0.0038 ug/L /Me#8270D/ ML 5ug/L, Me#610/ML 5ug/L& Me#625/ML 5ug/L
√	c. Benzo(b)Fluoranthene [7]	0.0038 ug/L /Me#8270D/ ML 5ug/L, Me#610/ML 5ug/L& Me#625/ML 5ug/L
√	d. Benzo(k)Fluoranthene [7]	0.0038 ug/L /Me#8270D/ ML 5ug/L, Me#610/ML 5ug/L& Me#625/ML 5ug/L
√	e. Chrysene [7]	0.0038 ug/L /Me#8270D/ML 5ug/L, Me#610/ML 5ug/L& Me#625/ML 5ug/L
√	f. Dibenzo(a,h)anthracene [7]	0.0038 ug/L /Me#8270D/ML 5ug/L, Me#610/ML 5ug/L& Me#625/ML 5ug/L
√	g. Indeno(1,2,3-cd) Pyrene [7]	0.0038 ug/L /Me#8270D/ML 5ug/L, Me#610/ML 5ug/L& Me#625/ML5ug/L
√	36. Total Group II Polycyclic Aromatic Hydrocarbons (PAH)	100 ug/L
√	h. Acenaphthene	X/Me#8270D/ML 5ug/L,Me#610/ML 5ug/L & Me#625/ML 5ug/L
√	i. Acenaphthylene	X/Me#8270D/ML 5ug/L,Me#610/ML 5ug/L & Me#625/ML 5ug/L
√	j. Anthracene	X/Me#8270D/ML 5ug/L,Me#610/ML 5ug/L & Me#625/ML 5ug/L
√	k. Benzo(ghi) Perylene	X/Me#8270D/ML 5ug/L,Me#610/ML 5ug/L & Me#625/ML 5ug/L
√	l. Fluoranthene	X/Me#8270D/ML 5ug/L,Me#610/ML 5ug/L & Me#625/ML 5ug/L
√	m. Fluorene	X/Me#8270D/ML 5ug/L,Me#610/ML 5ug/L & Me#625/ML 5ug/L
√	n. Naphthalene [5]	20 ug/l / Me#8270/ML 5ug/L, Me#610/ML 5ug/L & Me#625/ML 5ug/L
√	o. Phenanthrene	X/Me#8270D/ML 5ug/L,Me#610/ML 5ug/L & Me#625/ML 5ug/L
√	p. Pyrene	X/Me#8270D/ML5ug/L,Me#610/ML 5ug/L & Me#625/ML 5ug/L
√	37. Total Polychlorinated Biphenyls (PCBs) [8, 9]	0.000064 ug/L/Me# 608/ ML 0.5 ug/L
√	38. Chloride	Monitor only/Me# 300.0/ ML 100 ug/L

	Metal parameter	Total Recoverable MA/Metal Limit H [10] = 50 mg/l CaCO3, Units = ug/l [(11/12)] Freshwater Limits	Minimum level=ML	
√	39. Antimony	7.56	ML	10
√	40. Arsenic **	13.5	ML	20
√	41. Cadmium **	0.27	ML	10
√	42. Chromium III (trivalent) **	65.88	ML	15
	43. Chromium VI (hexavalent) **	11.4	ML	10
√	44. Copper **	7.02	ML	15
√	45. Lead **	1.75	ML	20
	46. Mercury **	1.21	ML	02
√	47. Nickel **	39.15	ML	20
√	48. Selenium **	6.75	ML	20
	49. Silver	1.2	ML	10
√	50. Zinc **	89.9	ML	15
√	51. Iron	1,350	ML	20

	Other Parameters	Limit
√	52. Instantaneous Flow	Site specific in CFS
√	53. Total Flow	Site specific in CFS
√	54. pH Range for Class A & Class B Waters in MA	6.5-8.3; 1/Month/Grab[13]
	55. pH Range for Class SA & Class SB Waters in MA	6.5-8.3; 1/Month/Grab[13]
	56. pH Range for Class B Waters in NH	6.5-8; 1/Month/Grab[13]
	57. Daily maximum temperature - Warm water fisheries	83°F; 1/Month/Grab[14]
	58. Daily maximum temperature - Cold water fisheries	68°F; 1/Month/Grab[14]
	59. Maximum Change in Temperature in MA - Any Class A water body	1.5°F; 1/Month/Grab[14]
	60. Maximum Change in Temperature in MA - Any Class B water body- Warm Water	5°F; 1/Month/Grab[14]
	61. Maximum Change in Temperature in MA – Any Class B water body - Cold water and Lakes/Ponds	3°F; 1/Month/Grab[14]
	62. Maximum Change in Temperature in MA – Any Class SA water body - Coastal	1.5°F; 1/Month/Grab[14]
	63. Maximum Change in Temperature in MA – Any Class SB water body - July to September	1.5°F; 1/Month/Grab[14]
	64. Maximum Change in Temperature in MA –Any Class SB water body - October to June	4°F; 1/Month/Grab[14]

Footnotes:

[1] Although the maximum values for TRC are 11ug/l and 7.5 ug/l for freshwater, and saltwater respectively, the compliance limits are equal to the minimum level (ML) of the test method used as listed in Appendix VI (i.e., Method 330.5, 20 ug/l).
[2] Limits for cyanide are based on EPA's water quality criteria expressed as micrograms per liter. There is currently no EPA approved test method for free cyanide. Therefore, total cyanide must be reported.
[3] Although the maximum values for cyanide are 5.2 ug/l and 1.0 ug/l for freshwater and saltwater, respectively, the compliance limits are equal to the minimum level (ML) of the Method 335.4 as listed in Appendix VI (i.e., 10 ug/l).
[4] BTEX = sum of Benzene, Toluene, Ethylbenzene, and total Xylenes.
[5] Naphthalene can be reported as both a purgeable (VOC) and extractable (SVOC) organic compound. If both VOC and SVOC are analyzed, the highest value must be used unless the QC criteria for one of the analyses is not met. In such cases, the value from the analysis meeting the QC criteria must be used.
[6] The sum of individual phthalate compounds(not including the #34, Bis (2-Ethylhexyl) Phthalate . The compliance limits are equal to the minimum level (ML) of the test method used as listed in Appendix VI.
Total values calculated for reporting on NOIs and discharge monitoring reports shall be calculated by adding the measured concentration of each constituent. If the measurement of a constituent is less than the ML, the permittee shall use a value of zero for that constituent. For each test, the permittee shall also attach the raw data for each constituent to the discharge monitoring report, including the minimum level and minimum detection level for the analysis.
[7] Although the maximum value for the individual PAH compounds is 0.0038 ug/l, the compliance limits are equal to the minimum level (ML) of the test method used as listed in Appendix VI.
[8] In the November 2002 WQC, EPA has revised the definition of Total PCBs for aquatic life as total PCBs is the sum of all homologue, all isomer, all congener, or all "Oroclor analyses."Total values calculated for reporting on NOIs and discharge monitoring reports shall be calculated by adding the measured concentration of each constituent. If the measure of a constituent is less than the ML, the permittee shall use a value of zero for that constituent. For each test, the permittee shall also attach the raw data for each constituent to the discharge monitoring report, including the minimum level and minimum detection level for the analysis.
[9]Although the maximum value for total PCBs is 0.000064 ug/l, the compliance limit is equal to the minimum level (ML) of the test method used as listed in Appendix VI (i.e., 0.5 ug/l for Method 608 or 0.00005 ug/l when Method 1668a is approved).
[10] Hardness. Cadmium, Chromium III, Copper, Lead, Nickel, Silver, and Zinc are Hardness Dependent.
[11] For a Dilution Factor (DF) from 1 to 5, metals limits are calculated using DF times the base limit for the metal. See Appendix IV. For example, iron limits are calculated using DF x 1,000ug/L (the iron base limit). Therefore DF is 1.5, the iron limit will be 1,500 ug/L; DF 2, then iron limit =1,000 x 2 =2,000 ug/L., etc. not to exceed the DF=5.
[12] Minimum Level (ML) is the lowest level at which the analytical system gives a recognizable signal and acceptable calibration point for the analyte. The ML represents the lowest concentration at which an analyte can be measured with a known level of confidence. The ML is calculated by multiplying the laboratory-determined method detection limit by 3.18 (see 40 CFR Part 136, Appendix B).
[13] pH sampling for compliance with permit limits may be performed using field methods as provided for in EPA test Method 150.1.
[14] Temperature sampling per Method 170.1

GZA
GeoEnvironmental, Inc.

Engineers and
Scientists

August 7, 2014
File No. 19274.08

Mr. Victor Alvarez
United States Environmental Protection Agency – Region 1
1 Congress Street, Suite 1100
Boston, Massachusetts 02114-2023

249 Vanderbilt Avenue
Norwood
Massachusetts
02062
781-278-3700
FAX 781-278-5701
http://www.gza.com

Re: Submittal of Notice of Intent (NOI)
Remedial General Permit
244 Worcester Street
North Grafton, Massachusetts
MassDEP - RTN No. 2-0535

Dear Mr. Alvarez:

GZA GeoEnvironmental, Inc. (GZA), on behalf of our client, Wyman-Gordon (W-G), is submitting the attached Notice of Intent (NOI) form (Attachment 1) for Remedial General Permit (RGP) authorization for remediation work being conducted under the Massachusetts Contingency Plan (MCP) at the 244 Worcester Street property (the Site). This NOI is being submitted for activities being conducted in accordance with the Phase IV Remedial Implementation Plan (RIP; MCP: 310 CMR 40.0870) for the West Side of the W-G property within an area known as the West PCB Area. The RIP for the West Side was submitted to the Massachusetts Department of Environmental Protection (MassDEP) on January 21, 2010. The work involved excavation and off-Site disposal of upland and wetland soils with polychlorinated biphenyls (PCBs) concentrations greater than 100 milligrams per kilogram (mg/kg) and consolidation of soils with PCBs concentrations less than or equal to 100 mg/kg beneath a low permeability soil cap to be constructed within the West PCB Area. The proposed cap will also cover historic sub-surface deposits of industrial process wastes, which are located within a portion of the West PCB Area.

This Site is also regulated by the US Environmental Protection Agency (EPA) Resource Conservation and Recovery Act (RCRA) Corrective Action Program because of its former status as a Storage Facility of Hazardous Waste, and the remediation work requires approval from EPA under the Toxic Substances Control Act (TSCA) because it is an action to remediate PCBs. We understand that EPA will issue formal approval under TSCA by August15, 2014.

RGP authorization is required to dewater, treat, and discharge groundwater likely to be encountered during the wetland soil excavation and that could potentially be encountered in adjacent upland portions where excavation depths may be 6 or more feet below ground surface (bgs). The enclosed NOI form provides the required information on the general site conditions, proposed treatment system, discharge location and receiving water, and analytical results for groundwater collected from a shallow pit dug in the Wetland Excavation Area. The remediation areas and proposed discharge locus at a nearby channelized, perennial stream know as Bonny Brook are shown in Attachment 3 – Figure 2A.

BACKGROUND

The W-G property is approximately 200 acres (Attachment 3 - Figures 2A and 2B). The West PCB Area comprises about 4 acres of upland (most of which is on the W-G property) and 1.2 acres of wetland. Only a portion of these upland and wetland areas (those portions with the highest PCB concentrations) will need to be remediated to meet the clean-up goals.

During the course of the Site investigation work, a debris pile was observed adjacent to an existing wetland. The debris pile included several empty and crushed barrels visible at the surface, other refuse, and black fill material. The laboratory analyses for samples from this fill material and soil from the adjacent wetland detected metals, petroleum, and PCBs. Subsequent sampling in the area near the eastern edge of the fill found concentrations of PCBs as high as 1,832 mg/kg in wetland soil and as high as 4,400 mg/kg in the upland soil/fill material.

An Order of Conditions (OOC) under the Massachusetts Wetlands Protection Act (Mass WPA) and wetland permit under the Town of Grafton Wetlands By-Law and Regulations were obtained in 2008. This work was also granted approval by the US Army Corps of Engineers (Category 2 Massachusetts Programmatic General Permit) and was issued a 401 Water Quality Certification (WQC) from the MassDEP from February 19, 2009. As a result of additional pre-characterization sampling performed to address more stringent clean-up goals requested by National Grid (NGrid) as a condition for property access, the extent of the remediation area needed to meet new PCB clean-up goals has increased. Thus, a new OOC under the Mass WPA and wetland and stormwater permits under the Town of Grafton By-Laws and Regulations were obtained on August 6, 2014. A request for modification and reauthorization of the general permit was filed with the US Army Corps of Engineers and a request for amendment and reauthorization of the WQC was filed with MassDEP and is expected soon.

PROPOSED ACTIVITIES

The main components of the work proposed on NGrid property are summarized as follows:

UPLAND SOIL REMEDIATION

Risk-Based Clean-up Goals (RBC Goals) for PCBs in upland and wetland soils were developed using human health and ecological risk assessments performed for the Site. The RBC Goal for the upland portion of the West PCB Area is an area weighted average of less than or equal to 0.9 mg/kg total PCBs within the top three feet of soil. The upland RBC Goal is set to protect ecological resources; the concentration that is protective of trespassers and utility workers is higher at 21 mg/kg. In addition, soils with greater than 100 mg/kg PCBs will be removed for off-site disposal regardless of depth. The upland area to be remediated on the NGrid property includes a portion adjacent to the wetland where excavations are expected to be on the order of 6 or more feet deep. These are initial excavation depths and foot prints only. The areas and depth of excavation may be larger depending upon results of confirmatory PCB sampling to be performed following the initial excavations.

Depending upon weather conditions prior to, and during the construction, the portions of the upland excavation that are excavated more than 6 feet may need to be dewatered by pumping.

WETLAND SOIL REMEDIATION

An area of up to 30,000 square feet of wetland soil, to a depth of approximately 2.5 feet may be removed to reach the clean-up goals. This will be determined by confirmatory sampling to evaluate whether the clean-up goal requested by NGrid has been achieved, which is ≤1 mg/kg total PCBs. The wetland soil RBC goal of 5.6 mg/kg is based on protection of trespassers and utility workers. As with the upland soil, the ultimate extent and depth of the excavation may be increased based on confirmatory sampling to be conducted after the initial excavation.

Depending upon weather conditions prior to, and during the construction, the wetland excavation may need to be dewatered by pumping.

Water will be pumped from the excavation to a temporary on-Site treatment facility. Treated water will then be discharged to nearby Bonny Brook. Bonny Brook originates from wetlands south of Route 122, upstream of the W-G property. The brook flows through a culvert under Route 122 and enters the W-G property near the Grafton/Millbury town line (Attachment 3 - Figure 2). Bonny Brook flows through W-G property, between the W-G North Grafton Facility and the W-G Millbury property and thence northward along the National Grid Company power line property that separates the two W-G facilities (Attachment 3 - Figure 2). At the northwest corner of the North Grafton facility, the brook turns eastward for approximately 650 feet before heading north through a culvert under the CSX Railroad right-of-way. North of the railroad tracks, Bonny Brook flows through a commercial/light industrial area, then through a residential property before entering Flint Pond.

NOTICE OF INTENT

This NOI has included a review of all literature pertaining to Areas of Critical Environmental Concern (ACEC), Endangered Species Act (ESA), and the National Historic Preservation Act (NHPA), as documented below:

- Review of Appendix I "Areas of Critical Environmental Concern" (June 2009) found that there are no ACEC located in the City of North Grafton, Massachusetts. Bonny Brook and Flint Pond are not part of the ACEC of Miscoe, Warren, and Whitehall Watersheds in neighboring Grafton, Massachusetts.
- Review of Appendix II "Federally Listed Endangered and Threatened Species in Massachusetts" (July 2008) found that there are no listed species in the Town of Grafton, Massachusetts.
- Review of the Interactive Priority and Estimated Habitats provided by the MassWildlife online viewer (2008) shows that neither the Site nor the discharge point are located within a National Heritage & Endangered Species Program (NHESP) Priority Habitats of Rare Species area or Estimated Habitats of Rare Wildlife area. Permit eligibility meets "Criterion A." As shown on the map

generated by the MassWildlife online viewer, which can be found in Attachment 6, approximately 5,000 linear feet downstream of the discharge point is the closest edge of the nearest downgradient Priority Habitats of Rare Species and Estimated Habitats of Rare Wildlife area.

- An electronic review of the Massachusetts Cultural Resource Information System database, made available through Massachusetts Historical Commission, found that no area, building, burial ground, object, or structure is located on the property located at 244 Worcester Street except for the Wyman Gordon Drop Forging Company. The documentation of this review can be found in Attachment 7. The Wyman Gordon Drop Forging Company will not be affected by the discharge. The project does not involve new construction or the demolition or rehabilitation of existing buildings or other structures or facilities and historic properties are not affected by the discharge or identified in the path of the discharges regulated by this permit; therefore, permit eligibility meets "Criterion 1."

Please do not hesitate to contact the undersigned at (781) 278-3700, if you have any questions or require further information.

Very truly yours,

GZA GEOENVIRONMENTAL, INC.

Timothy L. Briggs
Senior Environmental Specialist

Michele Simoneaux
Consultant/Reviewer

Gregg McBride
Principal

Attachments: Attachment 1: NOI Form
Attachment 2: Figure 1 – Site Locus Map
Attachment 3: Figure 2 – Site Plan
Attachment 4: Figure 3 – Process Flow Diagram
Attachment 5: Figure 4 – NHESP Map
Attachment 6: MHC Report
Attachment 7: Laboratory Analytical Results
Attachment 8: Supplemental Information – 7Q10 data for Watershed

cc: MassDEP – Central Region

ATTACHMENT 1

NOI FORM

B. Suggested Form for Notice of Intent (NOI) for the Remediation General Permit

1. General facility/site information. Please provide the following information about the site:

a) Name of **facility/site**: Wyman-Gordon Company		**Facility/site** mailing address:		
Location of **facility/site**: longitude: -71.7316 latitude: 42.23309	Facility SIC code(s):	Street: 244 Worcester Street		
b) Name of **facility/site owner:**		Town: Grafton		
Email address of facility/site owner: bpostale@wyman.com		State: MA	Zip: 01536	County: Worcester
Telephone no. of facility/site **owner**: 508-839-8191				
Fax no. of facility/site **owner**:		**Owner** is (check one): 1. Federal ○ 2. State/Tribal ○ 3. Private ◉ 4. Other ○ if so, describe:		
Address of **owner** (if different from site):				
Street:				
Town:	State:	Zip:	County:	
c) Legal name of **operator**:		**Operator** telephone no: 508-839-8191		
Wyman-Gordon Company		**Operator** fax no.:	**Operator** email: bpostale@wyman.com	
Operator contact name and title: Brian Postale, Manager of Safety and Workers Compensation				
Address of **operator** (if different from owner):	Street:			
Town:	State:	Zip:	County:	

d) Check Y for Ayes@ or N for Ano@ for the following:
1. Has a prior NPDES permit exclusion been granted for the discharge? Y ○ N ◉, if Y, number:
2. Has a prior NPDES application (Form 1 & 2C) ever been filed for the discharge?
Y ○ N ◉, if Y, date and tracking #:
3. Is the discharge a "new discharge" as defined by 40 CFR 122.2? Y ◉ N ○
4. For sites in Massachusetts, is the discharge covered under the Massachusetts Contingency Plan (MCP) and exempt from state permitting? Y ◉ N ○

e) Is site/facility subject to any State permitting, license, or other action which is causing the generation of discharge? Y ◉ N ○
If Y, please list:
1. site identification # assigned by the state of NH or MA: MCP RTN 2-0535
2. permit or license # assigned:
3. state agency contact information: name, location, and telephone number:
Paul Vigeant, DEP Central Regional Office, 627 Main St., Worcester, MA 01608, 508-767-2810

f) Is the site/facility covered by any other EPA permit, including:
1. Multi-Sector General Permit? Y ○ N ◉,
if Y, number:
2. Final Dewatering General Permit? Y ○ N ◉,
if Y, number:
3. EPA Construction General Permit? Y ◉ N ○,
if Y, number: MAR12AD95
4. Individual NPDES permit? Y ◉ N ○,
if Y, number: MA 0004341
5. any other water quality related individual or general permit? Y ○ N ◉, if Y, number:

g) Is the site/facility located within or does it discharge to an Area of Critical Environmental Concern (ACEC)? Y ○ N ◉

h) Based on the facility/site information and any historical sampling data, identify the sub-category into which the potential discharge falls.

Activity Category	**Activity Sub-Category**
I - Petroleum Related Site Remediation	A. Gasoline Only Sites ☐ B. Fuel Oils and Other Oil Sites (including Residential Non-Business Remediation Discharges) ☐ C. Petroleum Sites with Additional Contamination ☐
II - Non Petroleum Site Remediation	A. Volatile Organic Compound (VOC) Only Sites ☐ B. VOC Sites with Additional Contamination ☒ C. Primarily Heavy Metal Sites ☐
III - Contaminated Construction Dewatering	A. General Urban Fill Sites ☐ B. Known Contaminated Sites ☐

IV - Miscellaneous Related Discharges	A. Aquifer Pump Testing to Evaluate Formerly Contaminated Sites ☐ B. Well Development/Rehabilitation at Contaminated/Formerly Contaminated Sites ☐ C. Hydrostatic Testing of Pipelines and Tanks ☐ D. Long-Term Remediation of Contaminated Sumps and Dikes ☐ E. Short-term Contaminated Dredging Drain Back Waters (if not covered by 401/404 permit) ☐

2. Discharge information. Please provide information about the discharge, (attaching additional sheets as necessary) including:

a) Describe the discharge activities for which the owner/applicant is seeking coverage:

During the West PCB Area Cleanup Plan implementation activities in the Wetland Excavation Area, there is a likely need to discharge water generated from the dewatering of the wetland areas to be excavated and portions of the upland area where excavations could be 6 feet bgs .

b) Provide the following information about each discharge:

1) Number of discharge points: 1

2) What is the **maximum** and **average flow rate** of discharge (in cubic feet per second, ft^3/s)?
Max. flow: 0.11 Is maximum flow a **design value**? Y ◉ N ○
Average flow (include units): 0.11 cfs Is average flow a design value or estimate? estimate

3) Latitude and longitude of each discharge within 100 feet:
pt.1: lat. 42.2325 long. -71.7303 pt.2: lat. ____ long. ____;
pt.3: lat. ____ long. ____ pt.4: lat. ____ long. ____;
pt.5: lat. ____ long. ____ pt.6: lat. ____ long. ____;
pt.7: lat. ____ long. ____ pt.8: lat. ____ long. ____; etc.

4) If hydrostatic testing, total volume of the discharge (gals):

5) Is the discharge intermittent ◉ or seasonal ○?
Is discharge ongoing? Y ◉ N ○

c) Expected dates of discharge (mm/dd/yy): start 11-09-12 end 12-30-13

d) Please attach a line drawing or flow schematic showing water flow through the facility including:
1. sources of intake water, 2. contributing flow from the operation, 3. treatment units, and 4. discharge points and receiving waters(s). See Attachment 4 - Figure 3.

3. Contaminant information.

a) Based on the sub-category selected (see Appendix III), indicate whether each listed chemical is **believed present** or **believed absent** in the potential discharge. Attach additional sheets as needed.

Parameter *	CAS Number	Believed Absent	Believed Present	# of Samples	Sample Type (e.g., grab)	Analytical Method Used (method #)	Minimum Level (ML) of Test Method	Maximum daily value		Average daily value	
								concentration (ug/l)	mass (kg)	concentration (ug/l)	mass (kg)
1. Total Suspended Solids (TSS)		☐	☒	1	Grab	2540 D	5000	760000		760000	
2. Total Residual Chlorine (TRC)		☒	☐	1	Grab	4500Cl D	200	<20		<20	
3. Total Petroleum Hydrocarbons (TPH)		☒	☐	1	Grab	1664A	5000	<5000		<5000	
4. Cyanide (CN)	57125	☒	☐	1	Grab	4500 CN CE		<5.0		<5.0	
5. Benzene (B)	71432	☒	☐	1	Grab	8260B	2	<1.0		<1.0	
6. Toluene (T)	108883	☒	☐	1	Grab	8260B	2	<1.0		<1.0	
7. Ethylbenzene (E)	100414	☒	☐	1	Grab	8260B	2	<1.0		<1.0	
8. (m,p,o) Xylenes (X)	108883; 106423; 95476; 1330207	☒	☐	1	Grab	8260B	4	<1.0		<1.0	
9. Total BTEX [2]	n/a	☒	☐	1	Grab	8260B	2	<1.0		<1.0	
10. Ethylene Dibromide (EDB) (1,2-Dibromoethane) [3]	106934	☒	☐	1	Grab	8260B	10	<1.0		<1.0	
11. Methyl-tert-Butyl Ether (MtBE)	1634044	☒	☐	1	Grab	8260B	10	<1.0		<1.0	
12. tert-Butyl Alcohol (TBA) (Tertiary-Butanol)	75650	☒	☐	1	Grab	8260B	10	<25.0		<25.0	

***** Numbering system is provided to allow cross-referencing to Effluent Limits and Monitoring Requirements by Sub-Category included in Appendix III, as well as the Test Methods and Minimum Levels associated with each parameter provided in Appendix VI.

[2] BTEX = Sum of Benzene, Toluene, Ethylbenzene, total Xylenes.

[3] EDB is a groundwater contaminant at fuel spill and pesticide application sites in New England.

Parameter *	CAS Number	Believed Absent	Believed Present	# of Samples	Sample Type (e.g., grab)	Analytical Method Used (method #)	Minimum Level (ML) of Test Method	Maximum daily value		Average daily value	
								concentration (ug/l)	mass (kg)	concentration (ug/l)	mass (kg)
13. tert-Amyl Methyl Ether (TAME)	9940508	☒	☐	1	Grab	8260B	10	<2.0		<2.0	
14. Naphthalene	91203	☒	☐	1	Grab	8260B	2	<1.0		<1.0	
15. Carbon Tetrachloride	56235	☒	☐	1	Grab	8260B	5	<1.0		<1.0	
16. 1,2 Dichlorobenzene (o-DCB)	95501	☒	☐	1	Grab	8260B	5	<1.0		<1.0	
17. 1,3 Dichlorobenzene (m-DCB)	541731	☒	☐	1	Grab	8260B	5	<1.0		<1.0	
18. 1,4 Dichlorobenzene (p-DCB)	106467	☒	☐	1	Grab	8260B	5	<1.0		<1.0	
18a. Total dichlorobenzene		☒	☐	1	Grab	8260B		<1.0		<1.0	
19. 1,1 Dichloroethane (DCA)	75343	☒	☐	1	Grab	8260B	5	<1.0		<1.0	
20. 1,2 Dichloroethane (DCA)	107062	☒	☐	1	Grab	8260B	5	<1.0		<1.0	
21. 1,1 Dichloroethene (DCE)	75354	☒	☐	1	Grab	8260B	5	<1.0		<1.0	
22. cis-1,2 Dichloroethene (DCE)	156592	☒	☐	1	Grab	8260B	5	<1.0		<1.0	
23. Methylene Chloride	75092	☒	☐	1	Grab	8260B	5	<2.0		<2.0	
24. Tetrachloroethene (PCE)	127184	☒	☐	1	Grab	8260B	5	<1.0		<1.0	
25. 1,1,1 Trichloro-ethane (TCA)	71556	☒	☐	1	Grab	8260B	5	<1.0		<1.0	
26. 1,1,2 Trichloro-ethane (TCA)	79005	☒	☐	1	Grab	8260B	5	<1.0		<1.0	
27. Trichloroethene (TCE)	79016	☒	☐	1	Grab	8260B	5	<1.0		<1.0	

Parameter *	CAS Number	Believed Absent	Believed Present	# of Samples	Sample Type (e.g., grab)	Analytical Method Used (method #)	Minimum Level (ML) of Test Method	Maximum daily value		Average daily value	
								concentration (ug/l)	mass (kg)	concentration (ug/l)	mass (kg)
28. Vinyl Chloride (Chloroethene)	75014	☒	☐	1	Grab	8260B	5	<1.0		<1.0	
29. Acetone	67641	☒	☐	1	Grab	8260B	50	<10.0		<10.0	
30. 1,4 Dioxane	123911	☒	☐	1	Grab	8260B	5	<500		<500	
31. Total Phenols	108952	☒	☐	1	Grab	8270C	5	<10.6		<10.6	
32. Pentachlorophenol (PCP)	87865	☒	☐	1	Grab	8270C	5	<53.2		<53.2	
33. Total Phthalates (Phthalate esters) [4]		☒	☐	1	Grab	8270C	5	<10.6		<10.6	
34. Bis (2-Ethylhexyl) Phthalate [Di-(ethylhexyl) Phthalate]	117817	☒	☐	1	Grab	8270C	5	<6.4		<6.4	
35. Total Group I Polycyclic Aromatic Hydrocarbons (PAH)		☒	☐	1	Grab	8270C		<10.6		<10.6	
a. Benzo(a) Anthracene	56553	☒	☐	1	Grab	8270C	5	<10.6		<10.6	
b. Benzo(a) Pyrene	50328	☒	☐	1	Grab	8270C	5	<10.6		<10.6	
c. Benzo(b)Fluoranthene	205992	☒	☐	1	Grab	8270C	5	<10.6		<10.6	
d. Benzo(k)Fluoranthene	207089	☒	☐	1	Grab	8270C	5	<10.6		<10.6	
e. Chrysene	21801	☒	☐	1	Grab	8270C	5	<10.6		<10.6	
f. Dibenzo(a,h)anthracene	53703	☒	☐	1	Grab	8270C	5	<10.6		<10.6	
g. Indeno(1,2,3-cd) Pyrene	193395	☒	☐	1	Grab	8270C	5	<10.6		<10.6	
36. Total Group II Polycyclic Aromatic Hydrocarbons (PAH)		☒	☐	1	Grab	8270C		<10.6		<10.6	

[4] The sum of individual phthalate compounds.

Parameter *	CAS Number	Believed Absent	Believed Present	# of Samples	Sample Type (e.g., grab)	Analytical Method Used (method #)	Minimum Level (ML) of Test Method	Maximum daily value		Average daily value	
								concentration (ug/l)	mass (kg)	concentration (ug/l)	mass (kg)
h. Acenaphthene	83329	☒	☐	1	Grab	8270C	5	<10.6		<10.6	
i. Acenaphthylene	208968	☒	☐	1	Grab	8270C	5	<10.6		<10.6	
j. Anthracene	120127	☒	☐	1	Grab	8270C	5	<10.6		<10.6	
k. Benzo(ghi) Perylene	191242	☒	☐	1	Grab	8270C	5	<10.6		<10.6	
l. Fluoranthene	206440	☒	☐	1	Grab	8270C	5	<10.6		<10.6	
m. Fluorene	86737	☒	☐	1	Grab	8270C	5	<10.6		<10.6	
n. Naphthalene	91203	☒	☐	1	Grab	8270C	5	<10.6		<10.6	
o. Phenanthrene	85018	☒	☐	1	Grab	8270C	5	<10.6		<10.6	
p. Pyrene	129000	☒	☐	1	Grab	8270C	5	<10.6		<10.6	
37. Total Polychlorinated Biphenyls (PCBs)	85687; 84742; 117840; 84662; 131113; 117817.	☐	☒	1	Grab	8082A	0.5	461		461	
38. Chloride	16887006	☐	☒	1	Grab	300.0	100	900		900	
39. Antimony	7440360	☐	☒	1	Grab	7010	3	3.6		3.6	
40. Arsenic	7440382	☐	☒	1	Grab	7010	3	44.3		44.3	
41. Cadmium	7440439	☒	☐	1	Grab	6010B	0.5	<2.5		<2.5	
42. Chromium III (trivalent)	16065831	☐	☒	1	Grab	6010B	15	25		25	
43. Chromium VI (hexavalent)	18540299	☒	☐	1	Grab	7196A	10	<10		<10	
44. Copper	7440508	☐	☒	1	Grab	6010B	15	44		44	
45. Lead	7439921	☐	☒	1	Grab	6010B	20	35		35	
46. Mercury	7439976	☒	☐	1	Grab	7470A	0.2	<0.20		<0.20	
47. Nickel	7440020	☐	☒	1	Grab	6010B	20	29		29	
48. Selenium	7782492	☒	☐	1	Grab	6010B	20	<25		<25	
49. Silver	7440224	☒	☐	1	Grab	6010B	10	<5		<5	
50. Zinc	7440666	☐	☒	1	Grab	6010B	15	394		394	
51. Iron	7439896	☐	☒	1	Grab	6010B	20	18200		18200	
Other (describe):		☐	☐								

Parameter *	CAS Number	Believed Absent	Believed Present	# of Samples	Sample Type (e.g., grab)	Analytical Method Used (method #)	Minimum Level (ML) of Test Method	Maximum daily value		Average daily value	
								concentration (ug/l)	mass (kg)	concentration (ug/l)	mass (kg)
		☐	☐								
		☐	☐								

b) For discharges where **metals** are believed present, please fill out the following (attach results of any calculations):

Step 1: Do any of the metals in the influent exceed the effluent limits in Appendix III (i.e., the limits set at zero dilution)? Y◉ N○	If yes, which metals? As, Cu, Pb, Zn, Fe
Step 2: For any metals which exceed the **Appendix III** limits, calculate the **dilution factor (DF)** using the formula in Part I.A.3.c (step 2) of the NOI instructions or as determined by the State prior to the submission of this NOI. What is the dilution factor for applicable metals? Metal: As, Cu, Pb, Zn, Fe DF: 1.34 Metal: DF: Metal: DF: Metal: DF: Etc.	Look up the limit calculated at the corresponding dilution factor in **Appendix IV.** Do any of the metals in the **influent** have the potential to exceed the corresponding **effluent** limits in Appendix IV (i.e., is the influent concentration above the limit set at the calculated dilution factor)? Y◉ N○ If Y, list which metals: As, Cu, Pb, Zn, Fe

4. Treatment system information. Please describe the treatment system using separate sheets as necessary, including:

a) A description of the treatment system, including a schematic of the proposed or existing treatment system:

See Attachment 4 - Figure 3. Influent from the Site dewatering will flow into 2 fractionation tanks. Water will then go through bag filters and then liquid-phase granulated activated carbon filters.

b) Identify each applicable treatment unit (check all that apply):	Frac. tank ☒	Air stripper ☐	Oil/water separator ☐	Equalization tanks ☐	Bag filter ☒	GAC filter ☒
	Chlorination ☐	De-chlorination ☐	Other (please describe):			

c) Proposed **average** and **maximum flow rates** (gallons per minute) for the discharge and the **design flow rate**(s) (gallons per minute) of the treatment system:
Average flow rate of discharge 25 gpm Maximum flow rate of treatment system 50 gpm
Design flow rate of treatment system 50 gpm

d) A description of chemical additives being used or planned to be used (attach MSDS sheets):

None

5. Receiving surface water(s). Please provide information about the receiving water(s), using separate sheets as necessary:

a) Identify the discharge pathway:	Direct to receiving water ☒	Within facility (sewer) ☐	Storm drain ☐	Wetlands ☐	Other (describe):

b) Provide a narrative description of the discharge pathway, including the name(s) of the receiving waters:

Treated water discharges from the location of proposed treatment system into Bonny Brook, which flows into Flint Pond.

c) Attach a detailed map(s) indicating the site location and location of the outfall to the receiving water:
1. For multiple discharges, number the discharges sequentially.
2. For indirect dischargers, indicate the location of the discharge to the indirect conveyance and the discharge to surface water
The map should also include the location and distance to the nearest sanitary sewer as well as the locus of nearby sensitive receptors (based on USGS topographical mapping), such as surface waters, drinking water supplies, and wetland areas.

d) Provide the state water quality classification of the receiving water Class B

e) Provide the reported or calculated seven day-ten year low flow (7Q10) of the receiving water 0.0383 cfs
Please attach any calculation sheets used to support stream flow and dilution calculations.

f) Is the receiving water a listed 303(d) water quality impaired or limited water? Y ○ N ◉ If yes, for which pollutant(s)?

Is there a final TMDL? Y ◉ N ○ If yes, for which pollutant(s)? Phosphorous

6. ESA and NHPA Eligibility.

Please provide the following information according to requirements of Permit Parts I.A.4 and I.A.5 Appendices II and VII.

a) Using the instructions in Appendix VII and information on Appendix II, under which criterion listed in Part I.C are you eligible for coverage under this general permit?

A ◉ B ○ C ○ D ○ E ○ F ○

b) If you selected Criterion D or F, has consultation with the federal services been completed? Y ○ N ○ Underway ○

c) If consultation with U.S. Fish and Wildlife Service and/or NOAA Fisheries Service was completed, was a written concurrence finding that the discharge is "not likely to adversely affect" listed species or critical habitat received? Y ○ N ○

d) Attach documentation of ESA eligibility as described in the NOI instructions and required by Appendix VII, Part I.C, Step 4.

e) Using the instructions in Appendix VII, under which criterion listed in Part II.C are you eligible for coverage under this general permit?

1 ◉ 2 ○ 3 ○

f) If Criterion 3 was selected, attach all written correspondence with the State or Tribal historic preservation officers, including any terms and conditions that outline measures the applicant must follow to mitigate or prevent adverse effects due to activities regulated by the RGP.

7. Supplemental information.

Please provide any supplemental information. Attach any analytical data used to support the application. Attach any certification(s) required by the general permit.

Attachment 2: Figure 1 - Site Locus Map
Attachment 3: Figure 2 - Site Plan
Attachment 4: Figure 3 - Process Flow Diagram
Attachment 5: NHESP Map
Attachment 6: MHC Report
Attachment 7: Laboratory Analytical Results
Attachment 8: Supplemental Information - 7Q10 Data for Watershed

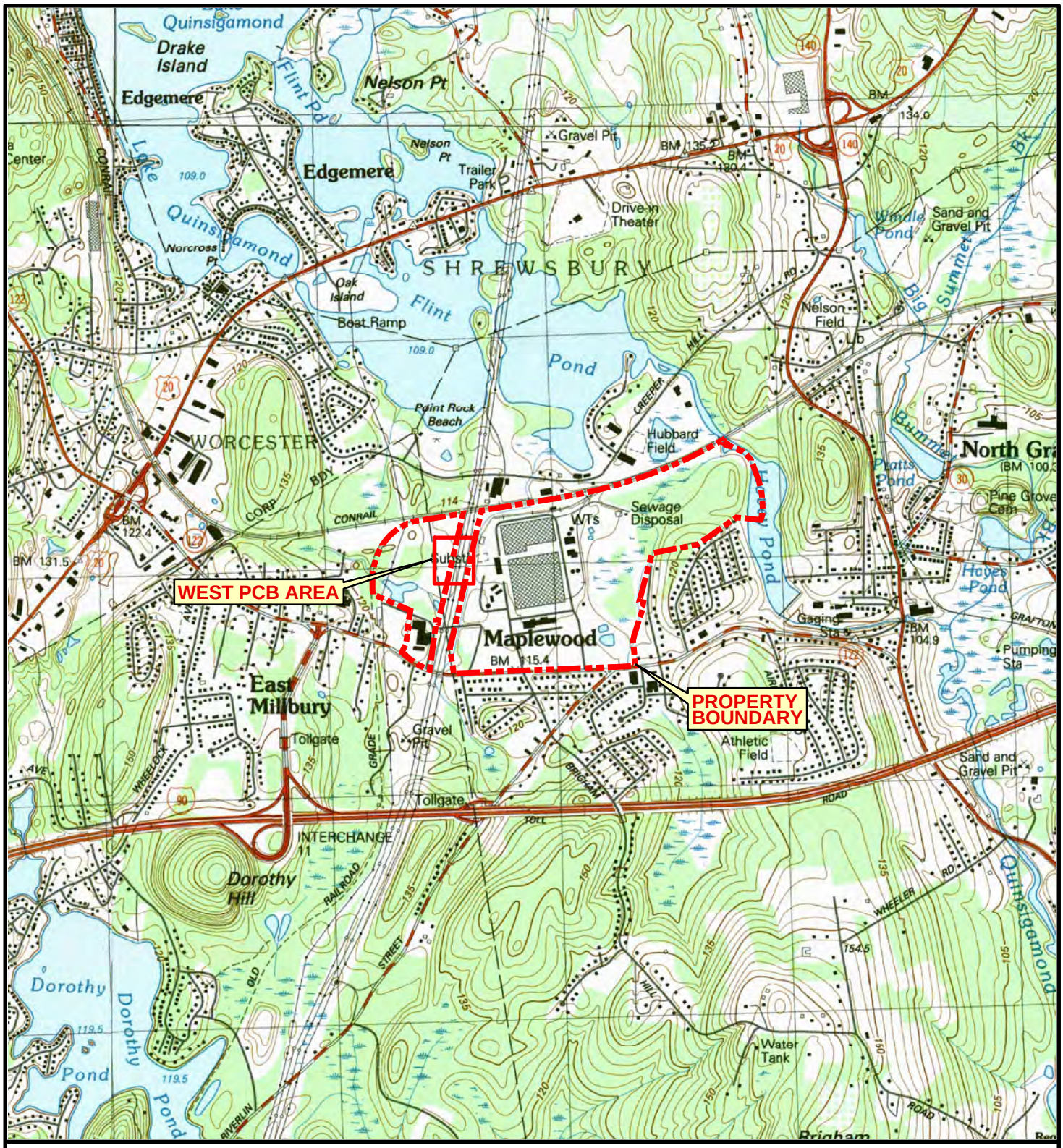
8. Signature Requirements: The Notice of Intent must be signed by the operator in accordance with the signatory requirements of 40 CFR Section 122.22, including the following certification:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, I certify that the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I certify that I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Facility/Site Name:	Wyman-Gordan Company
Operator signature:	Brian Postale
Printed Name &Title:	Brian Postale, Director EHS
Date:	8-7-2014

ATTACHMENT 2

FIGURE 1 – SITE LOCUS MAP



PROJ. MGR.: TLB
DESIGNED BY: TLB
REVIEWED BY: GWM
OPERATOR: SMW

DATE: 08-07-2014

LOCUS PLAN

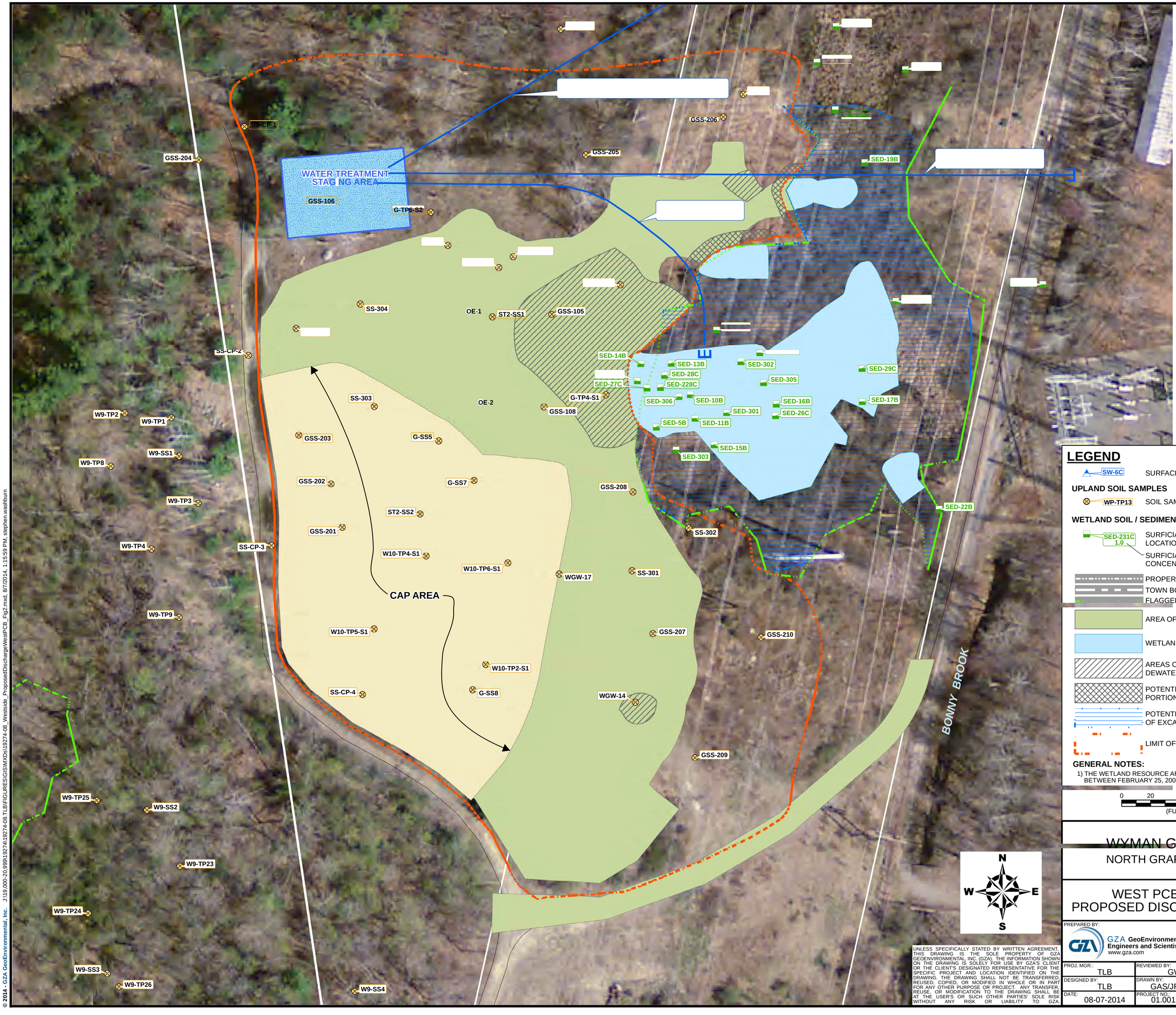
WYMAN GORDON
NORTH GRAFTON, MASSACHUSETTS

JOB NO.
01.0019274.08

FIGURE NO.
1

ATTACHMENT 3

FIGURE 2 – SITE PLAN



LEGEND

SW-6C — SURFACE WATER SAMPLE LOCATION

UPLAND SOIL SAMPLES

WP-TP13 — SOIL SAMPLE LOCATION IDENTIFIER

WETLAND SOIL / SEDIMENT SAMPLES

SED-231C 1.0 — SURFICIAL SEDIMENT SAMPLE LOCATION IDENTIFIER; SURFICIAL SEDIMENT PCB CONCENTRATION (mg/kg)

PROPERTY LINE

TOWN BOUNDARY

FLAGGED EDGE OF VEGETATED WETLAND

AREA OF EXCAVATION

WETLAND AREA OF EXCAVATION

AREAS OF EXCAVATION WITH DEPTHS DEEPER THAN 6' DEWATERING MAY BE REQUIRED

POTENTIAL DEWATERING AREA AROUND UPLAND PORTION OF WETLAND AREA OF EXCAVATION

POTENTIAL DEWATERING AREA AROUND WETLAND AREA OF EXCAVATION

LIMIT OF WEST PCB UPLAND AREA

GENERAL NOTES:

1) THE WETLAND RESOURCE AREAS SHOWN WERE DELINEATED BY BSC GROUP, INC. BETWEEN FEBRUARY 25, 2008 AND MARCH 21, 2008.

0 20 40 80 120

(FULL SITE) SCALE IN FEET

WYMAN GORDON WESTSIDE
NORTH GRAFTON, MASSACHUSETTS

WEST PCB AREA - NPDES RGP
PROPOSED DISCHARGE TO BONNY BROOK

PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com		PREPARED FOR: WYMAN GORDON A PCC Company	
PROJ. MGR.: TLB	REVIEWED BY: GWM	CHECKED BY: TLB	FIGURE: 2A
DESIGNED BY: TLB	DRAWN BY: GAS/JRC/EMD	SCALE: 1 INCH = 40 FEET	
DATE: 08-07-2014	PROJECT NO.: 01.0019274.08	REVISION NO.:	

LEGEND

SW-6C — SURFACE WATER SAMPLE LOCATION

UPLAND SOIL SAMPLES

WP-TP13 — SOIL SAMPLE LOCATION IDENTIFIER

WETLAND SOIL / SEDIMENT SAMPLES

SED-231C 1.0 — SURFICIAL SEDIMENT SAMPLE LOCATION IDENTIFIER; SURFICIAL SEDIMENT PCB CONCENTRATION (mg/kg)

APPROXIMATE PROPERTY LINE

APPROXIMATE TOWN BOUNDARY

APPROXIMATE VEGETATED WETLAND

WETLAND AREA OF EXCAVATION

POTENTIAL DEWATERING AREA AROUND WETLAND AREA OF EXCAVATION

GENERAL NOTES:

1) THE WETLANDS ARE INTERPRETED FROM 1:12,000 SCALE, STEREO COLOR-INFRARED (CIR) PHOTOGRAPHY BY STAFF AT UMASS AMHERST. THE PHOTOGRAPHY WAS CAPTURED IN 1990, 1991, 1992, 1993, 1999 AND 2000.

2) ALL UNDERGROUND UTILITIES SHOWN ARE APPROXIMATE ONLY. SEE CHAPTER 370 ACTS OF 1963, MASSACHUSETTS GENERAL LAWS. WE ASSUME NO RESPONSIBILITY FOR DAMAGES INCURRED AS A RESULT OF UTILITIES OMITTED OR INACCURATELY SHOWN. BEFORE PLANNING FUTURE CONNECTIONS, THE APPROPRIATE PUBLIC UTILITY ENGINEERING DEPARTMENT MUST BE CONSULTED.

N
W E
S

0 20 40 80
SCALE IN FEET

WYMAN GORDON WEST SIDE
NORTH GRAFTON. MASSACHUSETTS

PROPOSED NORTHERN WETLAND REMEDIATION AREA
PROPOSED DISCHARGE TO BONNY BROOK

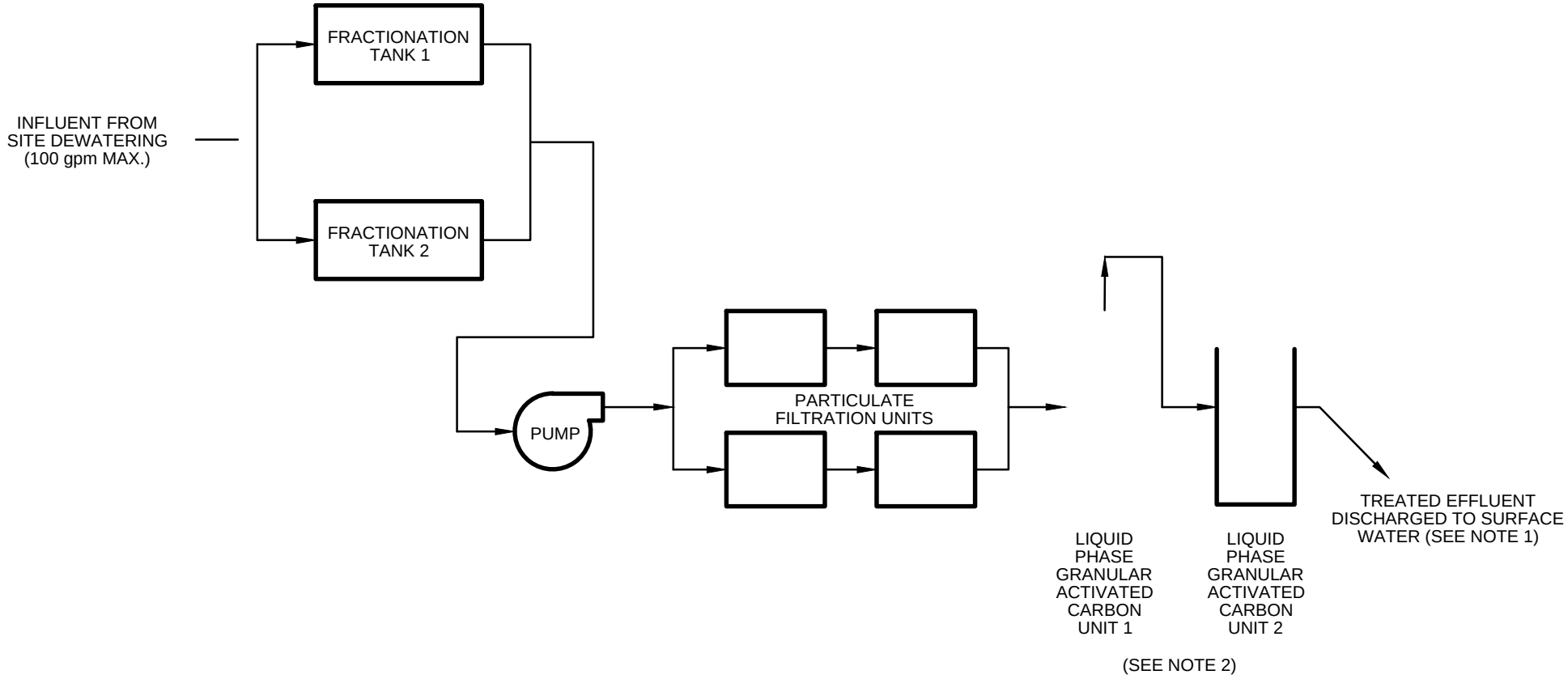
PREPARED BY:
GZA GeoEnvironmental, Inc.
Engineers and Scientists
www.gza.com

PREPARED FOR:
WYMAN GORDON
A PCC Company

PROJ MGR: TLB	REVIEWED BY: GWM	CHECKED BY: TLB	FIGURE 2B
DESIGNED BY: TLB	DRAWN BY: EMD/SMW	SCALE: 1 " = 40 FEET	
DATE: 08/07/2014	PROJECT NO. 01.0019274.08	REVISION NO.	

ATTACHMENT 4

FIGURE 3 – PROCESS FLOW DIAGRAM



NOTES:

1. DISCHARGE FROM THE VARIOUS AREAS WILL BE TO BONNY BROOK DOWN STREAM OF REMEDIATION AREA.

2. BASED ON ANALYTICAL RESULTS OF THE DISCHARGE AN IONIZATION EXCHANGE UNIT MAY ALSO BE NEEDED.

NO.	ISSUE/DESCRIPTION	BY	DATE

WEST PCB AREA
NORTH GRAFTON, MASSACHUSETTS

PROCESS FLOW DIAGRAM
PROPOSED DEWATERING TREATMENT SYSTEM

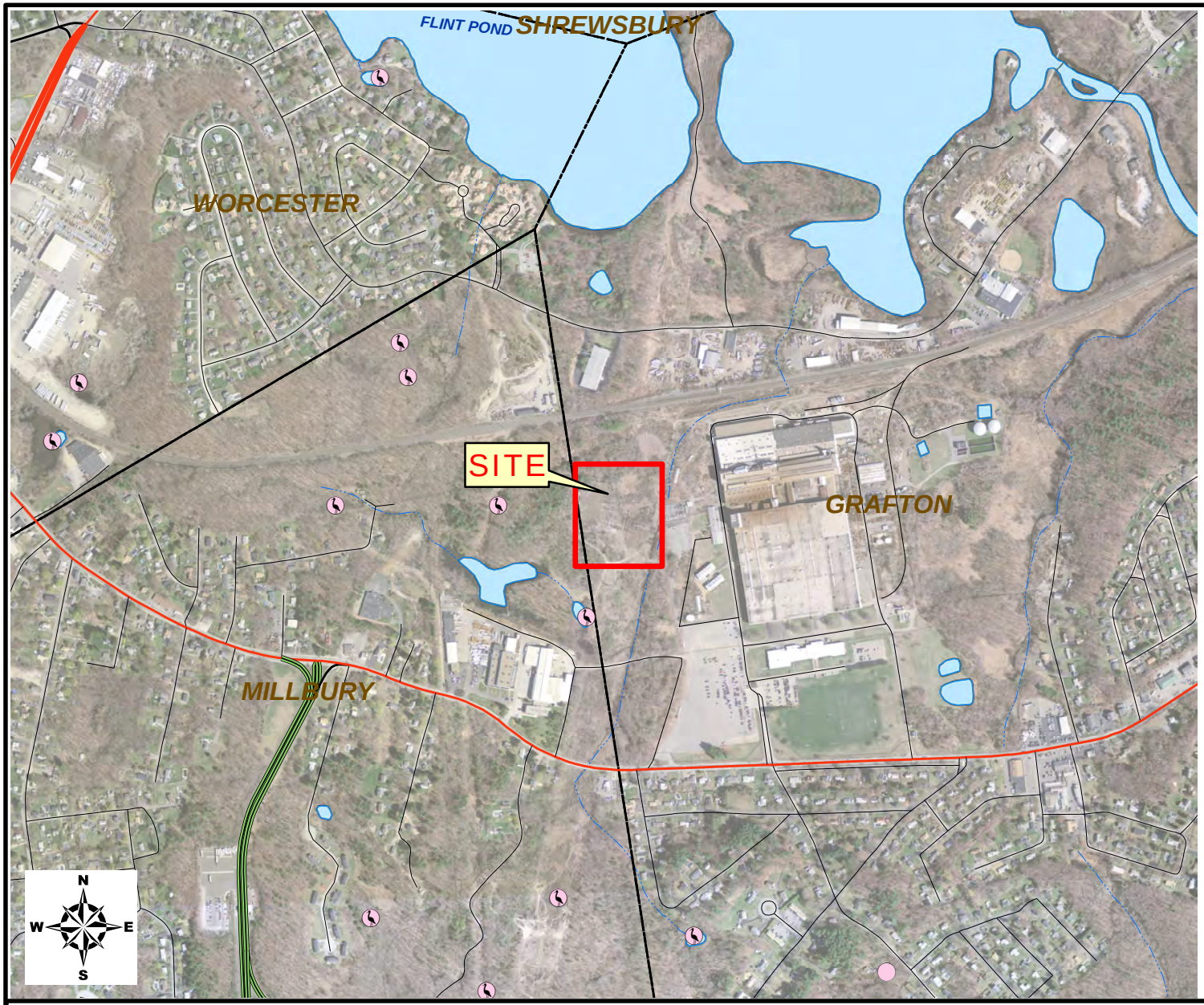
PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com

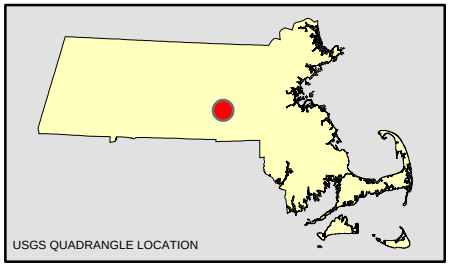
PREPARED FOR: WYMAN GORDON A PCC Company

PROJ MGR: TLB	REVIEWED BY: GWM	CHECKED BY: TLB	FIGURE 3
DESIGNED BY: SC/JAC	DRAWN BY: SMW	SCALE: NOT TO SCALE	
DATE: 08-07-2014	PROJECT NO. 01.0019274.08	REVISION NO.	

ATTACHMENT 5

FIGURE 4 – NHESP MAP





LEGEND

- NHESP Vernal Pools: Certified, Potential
- NHESP Estimated Habitats of Rare Wildlife: Use with MA Wetlands Protection Act (310 CMR 10.12)
- NHESP Priority Habitats of State-Listed Rare Species: Use with MA Wetlands Protection Act (310 CMR 10.12)

Hydrography

- Lake, Pond, Wide River, Impoundment
- Reservoir (with PWSID)

Rivers and Streams

- Stream
- Intermittent Stream
- Shoreline

EOT-OTP Roads

- Limited Access Highway
- Multi-Lane Highway, Unlimited Access
- Other Numbered Highway
- Major Road - Connector
- Minor Street or Road

SOURCE:

Priority and Estimated Habitats have been delineated by the Natural Heritage and Endangered Species Program of the Division of Fisheries and Wildlife. These layers are used for screening Projects and Activities that may impact state-listed rare species and their habitats. Priority and Estimated Habitat maps have been delineated based on the Best Scientific Evidence Available and according to the regulations of the Massachusetts Endangered Species Act (321 CMR 10.12) using documented records of rare species and various spatial layers.

The NHESP data was supplied by MassGIS in 2009 & 2013, the MassDOT Roads data was supplied by MassGIS in September 2012 and the Hydrography & Rivers and Streams data was supplied by MassGIS in March 2013.

The Color Ortho Imagery was acquired for the U. S. Geological Survey in April 2013 by Fugro Earthdata, Inc. Terrasurv, Inc. was contracted by Fugro to provide ground control survey to support photogrammetric mapping and blind QC points. The datalayer is produced and maintained by the USGS Earth Resources Observation and Science Center in Sioux City, SD. The imagery shown herein was downloaded from MassGIS on March 24, 2014.

MASS GIS | Natural Heritage & Endangered Species Program | MassWildlife Massachusetts Division of Fisheries & Wildlife | Natural Heritage & Endangered Species

0 500 1,000 2,000

SCALE IN FEET

PRIORITY HABITAT AND ESTIMATED HABITAT
NATURAL HERITAGE & ENDANGERED SPECIES PROGRAM

WYMAN GORDON WEST SIDE
NORTH GRAFTON, MASSACHUSETTS

GZA GeoEnvironmental, Inc.
249 Vanderbilt Avenue
Norwood, MA 02062
(P) 781-278-3700

JOB NO. 01.0019274.08

PROJ. MGR.: TLB
DESIGNED BY.: MS
REVIEWED BY.: GWM
OPERATOR.: SMW
DATE: 08-07-2014

FIGURE NO. 4

ATTACHMENT 6

MHC REPORT

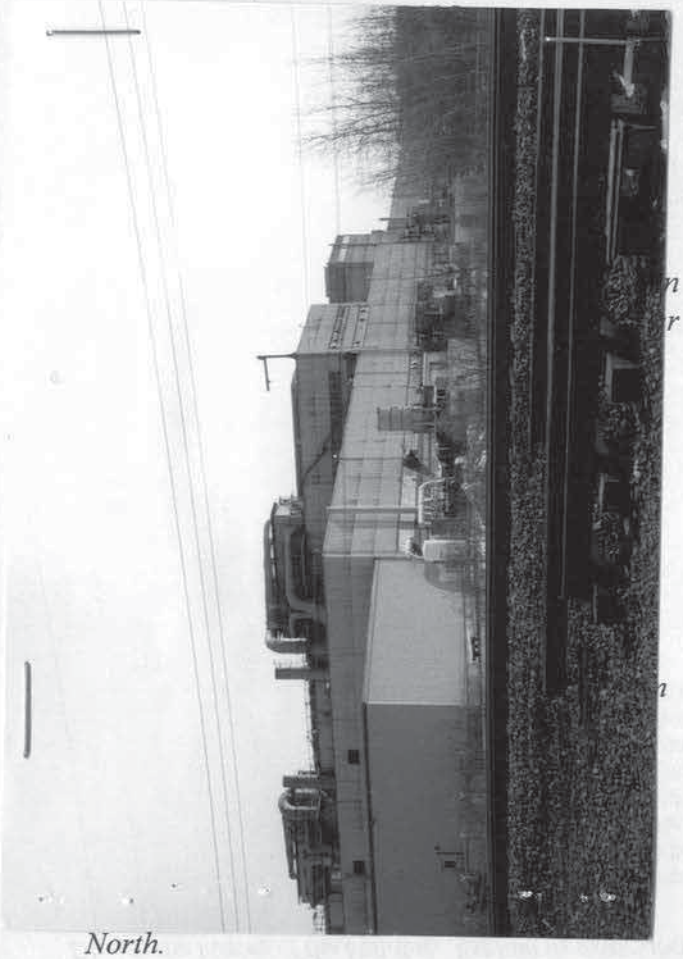
Massachusetts Cultural Resource Information System
Scanned Record Cover Page

Inventory No:	GRF.1187
Historic Name:	Wyman-Gordon Drop Forging Company
Common Name:	
Address:	244 Worcester St
City/Town:	Grafton
Village/Neighborhood:	North Grafton
Local No:	111-35-1
Year Constructed:	c 1930
Architect(s):	
Architectural Style(s):	No style
Use(s):	Forge; Industrial Complex or District; Machine Factory
Significance:	Architecture; Industry; Military
Area(s):	
Designation(s):	
Building Materials(s):	Roof: Tar, Built-up Wall: Brick; Concrete Unspecified; Sheet Metal; Concrete Cinderblock Foundation: Concrete Unspecified

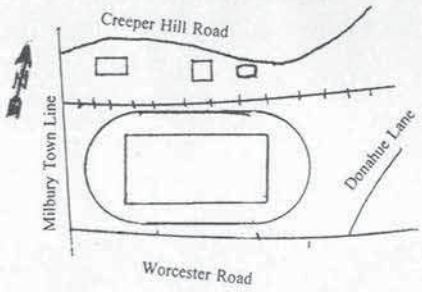
FORM B - BUILDING

Assessor's number	USGS Quad	Area(s)	Form Number
111/35/1	Milford GRAFTON		1187

Massachusetts Historical Commission
Massachusetts Archives Building
220 Morrissey Blvd.



North.



Recorded by Sanford Johnson

Organization Timelines Inc.

Date 04/96

Town GRAFTON

Place *(neighborhood or village)* NORTH GRAFTON

Address 244 Worcester Street

Historic Name WYMAN-GORDON COMPANY

Uses: **Present** Industrial

Original Industrial

Date of Construction ca. 1930

Source Company employee

Style/Form No style

Architect/Builder

Exterior Material:

Foundation Concrete

Wall/Trim Brick and concrete

Roof Tar

Outbuildings/Secondary Structures

Major Alteration *(with dates)*
Several large additions

Condition Good

Moved ☒ no ☐ yes Date

Acreage 189

Setting Commercial/residential with Conrail tracks to the north.

Follow Massachusetts Historical Commission Survey Manual instructions for completing this form.

GRF.1187

BUILDING FORM

ARCHITECTURAL DESCRIPTION ☐ *see continuation sheet*

Describe architectural features. Evaluate the characteristics of this building in terms of other buildings within the community.
No. 244 Worcester Street is a mid twentieth-century industrial/manufacturing complex built in many phases, beginning in ca. 1930. It is a one-story, flat-roof structure composed of several rectangular building sections occupying several hundred thousand square feet. It is constructed of brick, glass undetermined corrugated metal and concrete with aluminum roof vents. Sashes are fixed panes with metal frames. There is a large, rectangular brick section that was attached to the front of the structure in the mid twentieth century. The building appears in fair to good condition. Adjacent buildings are residential and industrial.

HISTORICAL NARRATIVE ☐ *see continuation sheet*

Discuss the history of the building. Explain its association with local (or state) history. Include uses of the building, and the role(s) the owners played within the community.

The approximate site of the Wyman-Gordon company was occupied in 1870 by a Mrs. N. (possibly Nelson), according to the Beers atlas of that year. The company was started in Worcester in 1883 by two graduates of Worcester Polytechnic Indstitute named Wyman and Gordon. The company began manufactruring drop forgings for loom and weaving equipment and expanded to include railroad and auto parts. By the 1890s, 40 men were employed by Wyman-Gordon and the product line was again expanded to include bicycles. The present building was first constructed prior to 1930, when Wyman-Gordon began forging aircraft, automobile and marine engine parts. During the same period, it became the largest drop-forging company in the world, employed 1,200 people at the new facility in Grafton and in Illinois, and produced 75% of all automobile-engine crankshafts. The company continued to grow through the purchase of larger hydraulic press equipment and did sufficient business with the railroad to install a siding to facilitate product shipment. The company continues to occupy the site and produce drop forgings.

BIBLIOGRAPHY and/or REFERENCE ☐ *see continuation sheet*

Beers atlas of Worcester County, 1870; Charles Brigham, Jr., 1831 map of Grafton; MHC Reconnaissance Report 1984; Ivan Sandrof, Massachusetts Towns: An 1840 Overview, 1963; Orra Stone, History of Massachusetts Industries, 1930.

☐ Recommended for listing in the National Register of Historic Places. *If checked, you must attach a completed National Register Criteria Statement form.*

GRF.1187
Groton AJ-
1187

The Commonwealth of Massachusetts

William Francis Galvin, Secretary of the Commonwealth
Massachusetts Historical Commission

September 9, 1996

Diana Parcon
Environmental Permitting Specialist
Massachusetts Bay Transportation
Authority
Ten Park Plaza
Boston, MA 02116-3974

RE: Cultural Resources Survey, Worcester Commuter Rail Extension Project; MHC #9415

Dear Ms. Parcon:

Staff of the Massachusetts Historical Commission have reviewed Volume II, "Historic Properties Survey For the Right-of-Way of the Worcester Commuter Rail Extension" which was submitted to this office together with original Area, Building, and Structure Forms. Please have two (2) additional copies of the final Volume II report submitted to the MHC to complete our files.

In general, the report is well-organized and comprehensive and MHC staff concur with the majority of the consultant's eligibility determinations for listing in the National Register of Historic Places and recommendations for further research. However, MHC staff do not agree that the right-of-way for the commuter rail extension constitutes a National Register-eligible entity; a fragment of the larger Boston & Worcester Railroad line, it retains insufficient integrity as an eligible property in its own right. After review and evaluation of this information, MHC staff have the following comments.

FRAMINGHAM

MHC staff concur that Lloyd's Diner (aka Worcester Lunch Car No. 749), 156 Fountain Street, is individually eligible for National Register listing. FRM.1073

The Fountain Street Area, a comparatively well-preserved complex of manufacturing and support buildings associated with the shoe, textiles, leather, and auto body manufacturing enterprises of Richard H. Long in the early 20th century, is National Register eligible. FRM.MA

The former Gossamer Rubber Company, 885 Waverly Street, appears to be eligible for listing for its associations with one of the oldest and largest rubber clothing manufacturers in the United States in the late 19th century; however, if National Register listing were to be pursued, additional information on construction dates and the physical development of the complex would be required. FRM.I

220 Morrissey Boulevard, Boston, Massachusetts 02125 · (617) 727-8470
(617) 727-5128, TDD: 1-800-392-60

GRF.1187

FRAMINGHAM (cont.)
The following properties are ineligible for National Register listing:

Angier Company Building, 50 Fountain Street FRM. 1074
R.H. Long Car Showroom, 635 Waverly Street FRM. 1075
Residence, 949 Waverly Street FRM. 1077
Residence, 997 Waverly Street FRM. 1078
Residence, 1007 Waverly Street FRM 1079
Residence, 1015 Waverly Street FRM. 1080
Residence, 1035 Waverly Street FRM 1081
Residence, 1045 Waverly Street FRM. 1082
Residence, 1051 Waverly Street FRM 1083

ASHLAND
The Tilton Avenue/Cherry Street Area is eligible for National Register listing as part of a larger Ashland Center historic district. ASL.C

The Kane/Ward Farmhouse, 34 Fountain Street, is individually eligible for National Register listing as a well-preserved example of a mid-19th century farmhouse with attached barn. ASL 416

The former Telechron Watch Company, constructed in 1927 at 50 Homer Street is eligible for individual listing in the National Register as the only Moderne Style building in Ashland. ASL.47

The following properties are ineligible for National Register listing:

Highway Department Garage, 80 Cherry Street ASL. 45
Cloyes Farm, 2-4 High Street ASL 411
Residence, 15 Metcalf Street ASL.25
C.H. Tilton Shoe Factory, 60 Pleasant Street ASL.23
Saving Spring Company, 280 Pleasant Street ASL 24
Commercial/Professional Complex, 360 Pleasant Street ASL.22
Beckongreen Garden Center, 18 Waverly Street ASL 48

SOUTHBOROUGH
The two mill villages of Cordaville and Southville, which developed in the mid-1800s in response to the 1830s construction of the Boston & Albany Railroad, are eligible for National Register listing. Although the mills at Cordaville are no longer extant, the community retains a significant collection of Early and Late Industrial residential architecture associated with industrial and commercial operations in the village. SBR. C

The village of Southville also retains a diverse collection of housing stock constructed in the mid and late 19th century in association with no longer extant boot and shoe factories, woolen and cotton mills, and a grist mill. In addition to the residences, the village also contains a church, former railroad depot, and community hall. Historical archaeological deposits at Cordaville and Southville may retain sufficient integrity as archaeological sites to be found eligible under Criterion D. MHC staff expects that additional information will be forthcoming as the result of archaeological investigations being undertaken. SBR. B

GRF.1187

WBO 408
WBO. 415
WBO. 416
WBO. 417
WBO 420
WBO 421
WBO 422
WBO. 419
WBO 409

WESTBOROUGH

The properties at 25, 27, and 46 High Street Extension, 11, 13, and 15 State Street, 38, 43, and 49 Water Street, and 20 Willow Street are eligible for National Register listing as an extension of the existing West Main Street Historic District.

The Eliezer Rice House, 37 Maynard Street, is individually eligible for National Register listing as a remarkably well-preserved example of a circa 1830 Federal Style farmhouse with an earlier circa 1730 rear ell, and for its associations with Eliezer Rice, an early settler of Westborough. WBO 37

The following properties are ineligible for National Register listing:

Corrugated Paper, 111 Milk Street WBO 418
Bay State Abrasives, Union Street WBO 423

GRAFTON

The Westborough Road Area, a grouping of moderately intact circa 1870 to 1900 single-family residences, appears to eligible for National Register listing; however, if National Register listing were to be pursued, additional information would be required regarding the area's association with the nearby J.S. Nelson shoe factory. GRF RQ

The Wyman-Gordon Company Building, 244 Worcester Street, is not eligible for listing. GRF 1187

WORCESTER

The East Worcester Street Area is eligible for listing in the National Register as a well-preserved complex of industrial and public-works buildings associated with the late 19th and early 20th century development of the City of Worcester. WOR EA

The following properties are ineligible for National Register listing:

Industrial Building, 1451 Grafton Street WOR 2254
Residence, 5 Hecla Street WOR 2257
Residence, 34 Nathaniel Street WOR 2260
White, Peavy & Dexter Co., Building, Putnam Lane WOR 2261
Industrial Building, 383 Shrewsbury Street WOR 2262

BRIDGES

The following bridges are individually eligible for listing in the National Register:

Ashland- Conrail over Stream (Boston & Albany Railroad Bridge No. 26.35) ASL 908
Conrail over Sudbury River (Boston & Albany Railroad Bridge No. 23.54) ASL 909

Southborough- Conrail over Ash Stream (Boston & Albany Railroad Bridge No. 27.29); also considered a contributing element in the Cordaville Historic Area SBR 925

Westborough- Conrail over Millpond (Boston & Albany Railroad Bridge No. 33.12) WBO. 937

GRF. 1187

The following bridges in Southborough are not individually eligible for National Register listing, but are considered eligible as contributing elements in the Cordaville Historic Area:

Conrail over Pedestrian Underpass (Boston & Albany Railroad Bridge No. 27.47) SBR 924
Conrail over Route 85 (Boston & Albany Railroad Bridge No. 27.34) SBR 923

The following bridges are ineligible for National Register Listing:

Ashland- Conrail over Indian Brook (Boston & Albany Railroad Bridge No. 25.84) ASL 910
Conrail over Sudbury River (Boston & Albany Railroad Bridge No. 23.83) ASL 911

Westborough- Conrail over Arch Street (Boston & Albany Railroad Bridge No. 34.73) WBO 934
Conrail over East Main Street (Boston & Albany Railroad Bridge No. 31.99) WBO 935
Fruit Street over Conrail (Boston & Albany Railroad Bridge No. 28.92) WBO 939
Conrail over Maynard Street (Boston & Albany Railroad Bridge No. 33.18) WBO 936
Conrail over Millpond (Boston & Albany Railroad Bridge No. 33.12) WBO 937
Conrail over Water Street (Boston & Albany Railroad Bridge No. 32.22) WBO 938

Grafton- Conrail over Blackstone River (Boston & Albany Railroad Bridge No. 38.24) GRF 9017
Conrail over Pedestrian Subway (Boston & Albany Railroad Bridge No. 37.82) GRF 9015
Conrail over Shrewsbury Street (Boston & Albany Railroad Bridge No. 37.90) GRF 9016

Worcester- Conrail over Putnam Avenue (Boston & Albany Railroad Bridge No. 43.31) WOR 947
Conrail over Route 20 (Boston & Albany Railroad Bridge No. 39.92) WOR 946
Conrail over Sunderland Road (Boston & Albany Railroad Bridge No. 40.23) WOR 945
Conrail over Seasonal Stream (Boston & Albany Railroad Bridge No. 41.89) WOR 944

Finally, MHC staff look forward to reviewing Volume IV on the Ashland, Southborough, and Westborough stations, and consulting on ways to avoid, minimize, or mitigate adverse effects to any significant historic or archaeological resources that may be affected by the project.

These comments are provided to assist in compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (36 CFR 800), Massachusetts General Laws, Chapter 9, Sec. 26-27c, as amended by Chapter 254 of the Acts of 1988 (950 CMR 71), MEPA (301 CMR 11), and the terms of the Process Memorandum of Agreement for this project.

If you have additional questions, please contact Allen Johnson or Edward L. Bell of this office.

Sincerely,

Judith B. McDonough
Executive Director
State Historic Preservation Officer
Massachusetts Historical Commission

cc: Local Historical Commissions
Michael Roberts, Timelines, Inc.
Leslie Donovan
James Herlihy, Edwards & Kelcey, Inc.
Jaqueline Wilkins, Rackemann Environmental Services, Inc.

FORM B - BUILDING

Assessor's Number	USGS Quad	Area(s)	Form Number
111/35/1	Milford		GRF.1187

Massachusetts Historical Commission
80 Boylston Street
Boston, Massachusetts 02116

Town Grafton

ighborhood or village)

244 Worcester Street

Name Wyman-Gordon Company

resent Commercial

riginal Commercial

Construction ca. 1945

Company Employee

rm

t/Builder

Exterior Material:

Foundation Concrete

Wall/Trim Brick and concrete

Roof Tar

Outbuildings/Secondary Structures

Major Alterations *(with dates)*

Condition Good

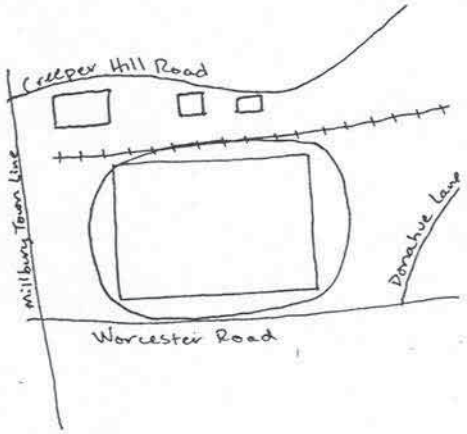
Moved ☐ no ☐ yes Date

Acreage 189 acres

Setting Commercial/residential with Conrail tracks to the north.

Sketch Map

Draw a map showing the building's location in relation to the nearest cross streets and/or major natural features. Show all buildings between inventoried building and nearest intersection or natural feature. Label streets including route numbers, if any. Circle and number the inventoried building. Indicate north.



Recorded by Barbara Putnam and Rachel Smith

Organization Timelines, Inc.

Date *(month/year)* 1/95

Follow Massachusetts Historical Commission Survey Manual instructions for completing this form.

GRF.1187

BUILDING FORM

ARCHITECTURAL DESCRIPTION ☐ *see continuation sheet*

Describe architectural features. Evaluate the characteristics of this building in terms of other buildings within the community.

Rising a tall single story from a concrete foundation, 244 Worcester Street is a brick and concrete, flat-roofed industrial building. The shape of this building is highly irregular and it appears that many concrete-block additions to the north have been made to this structure, home of the Wyman-Gordon Company. The facade of the building has a band of brick, a band of windows, and a band of concrete from bottom to top. Many metal vent shafts are located throughout the main building and the extensions to the north. 244 Worcester Street is located in a residential/industrial area (the other side of the road is residential) and is atypical of its surroundings.

HISTORICAL NARRATIVE ☐ *see continuation sheet*

Discuss the history of the building. Explain its associations with local (or state) history. Include uses of the buildings, and the role(s) the owners/occupants played within the community.

This section of North Grafton, between Worcester Road and Creeper Hill Road, west of the present Donahue Lane, remained undeveloped prior to the construction of the Wyman-Gordon Company complex. Involved in aircraft forging, this company was started with an 18,000-ton hydraulic press and by 1963 had added a 35,000-ton and a 50,000-ton hydraulic press. Located south of and adjacent to the tracks of the Boston and Albany Railroad, the plant is reached by several railroad spurs to facilitate shipping and receiving.

BIBLIOGRAPHY and/or REFERENCES ☐ *see continuation sheet*

Beers, F.W.
1870 *Atlas of Worcester County. Massachusetts.* F.W.Beers, New York.

Brigham, Jr., Charles
1837 Map of Grafton, Worcester County. Pendleton's Lithography, Boston.

Massachusetts Historical Commission
1984 *Reconnaissance Survey Report: Grafton*. Massachusetts Historical Commission, Boston.

Sandrup, Ivan
1963 *Massachusetts Towns: An 1840 Overview.* Barre Publishers, Barre.

☐ Recommended for listing in the National Register of Historic Places. *If checked, you must attach a completed National Register Criteria Statement Form.*

Massachusetts Cultural Resource Information System
MACRIS

MACRIS Search Results

Search Criteria: Town(s): Grafton; Street No: 244; Street Name: worcester; Resource Type(s): Area, Building, Burial Ground, Object, Structure;

Inv. No.	Property Name	Street	Town	
GRF.1187	Wyman-Gordon Drop Forging Company	244 Worcester St	Grafton	

ATTACHMENT 7

LABORATORY ANALYTICAL RESULTS

CERTIFICATE OF ANALYSIS

Tim Briggs
GZA GeoEnvironmental, Inc.
One Edgewater Drive
Norwood, MA 02062

RE: Wyman Gordon West PCB (01.019274.08 task 3)
ESS Laboratory Work Order Number: 1208043

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 10:03 am, Aug 20, 2012

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

ESS Laboratory certifies that the test results meet the requirements of NELAC and A2LA, except where noted within this project narrative.

Subcontracted Analyses

ESS Laboratory - Hopkinton - Hopkinton, MA	Volatile Compounds

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Wyman Gordon West PCB

ESS Laboratory Work Order: 1208043

SAMPLE RECEIPT

The following samples were received on August 02, 2012 for the analyses specified on the enclosed Chain of Custody Record.

To achieve CAM compliance for MCP data, ESS Laboratory has performed and reviewed all QA/QC Requirements and Performance Standards listed in each method. Holding times and preservation have also been reviewed. All CAM requirements have been achieved unless noted in the project narrative.

Each method has been set-up in the laboratory to reach required MCP standards. The methods for aqueous VOA and Soil Methanol VOA have known limitations for certain analytes. The regulatory standards may not be achieved due to these limitations. In addition, for all methods, matrix interferences, dilutions, and %Solids may elevate method reporting limits above regulatory standards. ESS Laboratory can provide, upon request, a Data Checker (regulatory standard comparison spreadsheet) electronic deliverable which will highlight these exceedances.

For EPH soil samples, the aromatic range results have been corrected for identified cartridge contaminant in accordance with the CAM protocol.

Question I: All samples for Metals were analyzed for a subset of the required MCP list per the client's request.

Revision 1 August 20, 2012: This report has been revised to include tert-butyl alcohol results.

Lab Number	SampleName	Matrix	Analysis
1208043-01	WPCBW-1	Ground Water	1664A, 2540D, 300.0, 4500 CN CE, 4500Cl D, 6010B, 7010, 7196A, 7470A, 8082A, 8260, 8270C

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Wyman Gordon West PCB ESS Laboratory Work Order: 1208043

PROJECT NARRATIVE

8082A Polychlorinated Biphenyls (PCB)

1208043-01 **Surrogate recovery(ies) diluted below the MRL (SD).**
Decachlorobiphenyl (% @ 30-150%), Decachlorobiphenyl [2C] (% @ 30-150%), Tetrachloro-m-xylene (% @ 30-150%), Tetrachloro-m-xylene [2C] (% @ 30-150%)

8260B Volatile Organic Compounds

N2H0005-CCV1 **Continuing Calibration recovery is above upper control limit (C+).**
Tetrahydrofuran

N2H0005-CCV1 **The Response Factor (RF) for this analyte did not meet the minimum RF criteria specified in Table 4 of Method 8260C, but was above 0.050. (0.064)**
Acetone

8270C Semi-Volatile Organic Compounds

CH20617-BSD1 **Relative percent difference for duplicate is outside of criteria (D+).**
2-Chlorophenol (25%), 2-Nitrophenol (22%)

CVH0065-CCV1 **Initial Calibration Verification recovery is outside of control limit (ICV).**
Hexachlorocyclopentadiene

Classical Chemistry

1208043-01 **The maximum holding time listed in 40 CFR Part 136 Table II for pH, Dissolved Oxygen, Sulfite and Residual Chlorine is fifteen minutes.**
Total Residual Chlorine

No other observations noted.

End of Project Narrative.

DATA USABILITY LINKS

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Wyman Gordon West PCB

ESS Laboratory Work Order: 1208043

MassDEP Analytical Protocol Certification Form

MADEP RTN: _____

This form provides certification for the following data set: **1208043-01**

Matrices: (X) Ground Water/Surface Water ( ) Soil/Sediment ( ) Drinking Water ( ) Air ( ) Other:_ _

CAM Protocol (check all that apply below):

(X) 8260 VOC CAM II A	(X) 7470/7471 Hg CAM III B	( ) MassDEP VPH CAM IV A	( ) 8081 Pesticides CAM V B	( ) 7196 Hex Cr CAM VI B	( ) MassDEP APH CAM IX A
(X) 8270 SVOC CAM II B	(X) 7010 Metals CAM III C	( ) MassDEP EPH CAM IV B	( ) 8151 Herbicides CAM V C	( ) 8330 Explosives CAM VIII A	( ) TO-15 VOC CAM IX B
(X) 6010 Metals CAM III A	( ) 6020 Metals CAM III D	(X) 8082 PCB CAM V A	( ) 6860 Perchlorate CAM VIII B	( ) 9014 Total Cyanide/PAC CAM VI A	

Affirmative responses to questions A through F are required for "Presumptive Certainty" status

A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	Yes (X) No ( )
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	Yes (X) No ( )
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	Yes (X) No ( )
D	Does the laboratory report comply with all the reporting requirements specified in the CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	Yes (X) No ( )
E	a. VPH, EPH, APH and TO-15 only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	Yes ( ) No ( )
	b. APH and TO-15 Methods only: Was the complete analyte list reported for each method?	Yes ( ) No ( )
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	Yes (X) No ( )

Responses to Questions G, H and I below are required for "Presumptive Certainty" status

G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocols(s)?	Yes (X) No ( )*
	***Data User Note:* Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WSC-07-350.**	
H	Were **all** QC performance standards specified in the CAM protocol(s) achieved?	Yes ( ) No (X)*
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	Yes ( ) No (X)*

All negative responses must be addressed in an attached laboratory narrative.

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.

Signature: Laurel Stoddard _ Date: August 09, 2012

Printed Name: Laurel Stoddard Position: Laboratory Director

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Wyman Gordon West PCB
Client Sample ID: WPCBW-1
Date Sampled: 08/02/12 12:45
Percent Solids: N/A

ESS Laboratory Work Order: 1208043
ESS Laboratory Sample ID: 1208043-01
Sample Matrix: Ground Water
Units: ug/L

3005A/3020A/6000/7000 Total Metals

Analyte	Results (MRL)	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Antimony	**3.6** (2.5)	7010		1	SVD	08/07/12 19:19	50	25	CH20302
Arsenic	**44.3** (12.5)	7010		5	SVD	08/08/12 9:44	50	25	CH20302
Cadmium	ND (2.5)	6010B		1	SVD	08/03/12 20:52	50	25	CH20302
Chromium	**25** (10)	6010B		1	SVD	08/03/12 20:52	50	25	CH20302
Copper	**44** (10)	6010B		1	SVD	08/03/12 20:52	50	25	CH20302
Iron	**18200** (50)	6010B		1	SVD	08/03/12 20:52	50	25	CH20302
Lead	**35** (10)	6010B		1	SVD	08/03/12 20:52	50	25	CH20302
Mercury	ND (0.20)	7470A		1	LLZ	08/06/12 11:33	20	40	CH20315
Nickel	**29** (25)	6010B		1	SVD	08/03/12 20:52	50	25	CH20302
Selenium	ND (25)	6010B		1	SVD	08/03/12 20:52	50	25	CH20302
Silver	ND (5)	6010B		1	SVD	08/03/12 20:52	50	25	CH20302
Zinc	**394** (25)	6010B		1	SVD	08/03/12 20:52	50	25	CH20302

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Wyman Gordon West PCB
Client Sample ID: WPCBW-1
Date Sampled: 08/02/12 12:45
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 5
Extraction Method: 3510C

ESS Laboratory Work Order: 1208043
ESS Laboratory Sample ID: 1208043-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: TAJ
Prepared: 8/3/12 9:00
Cleanup Method: 3665A

8082A Polychlorinated Biphenyls (PCB)

Analyte	Results (MRL)	Limit	DF	Analyzed	Sequence	Batch
Aroclor 1016	ND (46.7)		100	08/06/12 20:39		CH20228
Aroclor 1221	ND (46.7)		100	08/06/12 20:39		CH20228
Aroclor 1232	ND (46.7)		100	08/06/12 20:39		CH20228
Aroclor 1242	ND (46.7)		100	08/06/12 20:39		CH20228
Aroclor 1248	ND (46.7)		100	08/06/12 20:39		CH20228
Aroclor 1254	**461** (46.7)		100	08/06/12 20:39		CH20228
Aroclor 1260	ND (46.7)		100	08/06/12 20:39		CH20228
Aroclor 1262	ND (46.7)		100	08/06/12 20:39		CH20228
Aroclor 1268	ND (46.7)		100	08/06/12 20:39		CH20228

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	%	SD	30-150
Surrogate: Decachlorobiphenyl [2C]	%	SD	30-150
Surrogate: Tetrachloro-m-xylene	%	SD	30-150
Surrogate: Tetrachloro-m-xylene [2C]	%	SD	30-150

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Wyman Gordon West PCB
Client Sample ID: WPCBW-1
Date Sampled: 08/02/12 12:45
Percent Solids: N/A
Initial Volume: 940
Final Volume: 1
Extraction Method: 3520C

ESS Laboratory Work Order: 1208043
ESS Laboratory Sample ID: 1208043-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: IBM
Prepared: 8/6/12 18:30

8270C Semi-Volatile Organic Compounds

Analyte	Results (MRL)	Limit	DF	Analyzed	Sequence	Batch
1,1-Biphenyl	ND (10.6)		1	08/08/12 0:03	CVH0065	CH20617
1,2,4-Trichlorobenzene	ND (10.6)		1	08/08/12 0:03	CVH0065	CH20617
1,2-Dichlorobenzene	ND (10.6)		1	08/08/12 0:03	CVH0065	CH20617
1,3-Dichlorobenzene	ND (10.6)		1	08/08/12 0:03	CVH0065	CH20617
1,4-Dichlorobenzene	ND (10.6)		1	08/08/12 0:03	CVH0065	CH20617
2,3,4,6-Tetrachlorophenol	ND (53.2)		1	08/08/12 0:03	CVH0065	CH20617
2,4,5-Trichlorophenol	ND (10.6)		1	08/08/12 0:03	CVH0065	CH20617
2,4,6-Trichlorophenol	ND (10.6)		1	08/08/12 0:03	CVH0065	CH20617
2,4-Dichlorophenol	ND (10.6)		1	08/08/12 0:03	CVH0065	CH20617
2,4-Dimethylphenol	ND (53.2)		1	08/08/12 0:03	CVH0065	CH20617
2,4-Dinitrophenol	ND (53.2)		1	08/08/12 0:03	CVH0065	CH20617
2,4-Dinitrotoluene	ND (10.6)		1	08/08/12 0:03	CVH0065	CH20617
2,6-Dinitrotoluene	ND (10.6)		1	08/08/12 0:03	CVH0065	CH20617
2-Chloronaphthalene	ND (10.6)		1	08/08/12 0:03	CVH0065	CH20617
2-Chlorophenol	ND (10.6)		1	08/08/12 0:03	CVH0065	CH20617
2-Methylnaphthalene	ND (10.6)		1	08/08/12 0:03	CVH0065	CH20617
2-Methylphenol	ND (10.6)		1	08/08/12 0:03	CVH0065	CH20617
2-Nitroaniline	ND (10.6)		1	08/08/12 0:03	CVH0065	CH20617
2-Nitrophenol	ND (10.6)		1	08/08/12 0:03	CVH0065	CH20617
3,3´-Dichlorobenzidine	ND (21.3)		1	08/08/12 0:03	CVH0065	CH20617
3+4-Methylphenol	ND (21.3)		1	08/08/12 0:03	CVH0065	CH20617
3-Nitroaniline	ND (10.6)		1	08/08/12 0:03	CVH0065	CH20617
4,6-Dinitro-2-Methylphenol	ND (53.2)		1	08/08/12 0:03	CVH0065	CH20617
4-Bromophenyl-phenylether	ND (10.6)		1	08/08/12 0:03	CVH0065	CH20617
4-Chloro-3-Methylphenol	ND (10.6)		1	08/08/12 0:03	CVH0065	CH20617
4-Chloroaniline	ND (21.3)		1	08/08/12 0:03	CVH0065	CH20617
4-Chloro-phenyl-phenyl ether	ND (10.6)		1	08/08/12 0:03	CVH0065	CH20617
4-Nitroaniline	ND (10.6)		1	08/08/12 0:03	CVH0065	CH20617
4-Nitrophenol	ND (53.2)		1	08/08/12 0:03	CVH0065	CH20617
Acenaphthene	ND (10.6)		1	08/08/12 0:03	CVH0065	CH20617
Acenaphthylene	ND (10.6)		1	08/08/12 0:03	CVH0065	CH20617

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Wyman Gordon West PCB
Client Sample ID: WPCBW-1
Date Sampled: 08/02/12 12:45
Percent Solids: N/A
Initial Volume: 940
Final Volume: 1
Extraction Method: 3520C

ESS Laboratory Work Order: 1208043
ESS Laboratory Sample ID: 1208043-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: IBM
Prepared: 8/6/12 18:30

8270C Semi-Volatile Organic Compounds

Analyte	Results (MRL)	Limit	DF	Analyzed	Sequence	Batch
Acetophenone	ND (10.6)		1	08/08/12 0:03	CVH0065	CH20617
Aniline	ND (10.6)		1	08/08/12 0:03	CVH0065	CH20617
Anthracene	ND (10.6)		1	08/08/12 0:03	CVH0065	CH20617
Azobenzene	ND (21.3)		1	08/08/12 0:03	CVH0065	CH20617
Benzo(a)anthracene	ND (10.6)		1	08/08/12 0:03	CVH0065	CH20617
Benzo(a)pyrene	ND (10.6)		1	08/08/12 0:03	CVH0065	CH20617
Benzo(b)fluoranthene	ND (10.6)		1	08/08/12 0:03	CVH0065	CH20617
Benzo(g,h,i)perylene	ND (10.6)		1	08/08/12 0:03	CVH0065	CH20617
Benzo(k)fluoranthene	ND (10.6)		1	08/08/12 0:03	CVH0065	CH20617
Benzoic Acid	ND (106)		1	08/08/12 0:03	CVH0065	CH20617
Benzyl Alcohol	ND (10.6)		1	08/08/12 0:03	CVH0065	CH20617
bis(2-Chloroethoxy)methane	ND (10.6)		1	08/08/12 0:03	CVH0065	CH20617
bis(2-Chloroethyl)ether	ND (10.6)		1	08/08/12 0:03	CVH0065	CH20617
bis(2-chloroisopropyl)Ether	ND (10.6)		1	08/08/12 0:03	CVH0065	CH20617
bis(2-Ethylhexyl)phthalate	ND (6.4)		1	08/08/12 0:03	CVH0065	CH20617
Butylbenzylphthalate	ND (10.6)		1	08/08/12 0:03	CVH0065	CH20617
Carbazole	ND (10.6)		1	08/08/12 0:03	CVH0065	CH20617
Chrysene	ND (10.6)		1	08/08/12 0:03	CVH0065	CH20617
Dibenzo(a,h)Anthracene	ND (10.6)		1	08/08/12 0:03	CVH0065	CH20617
Dibenzofuran	ND (10.6)		1	08/08/12 0:03	CVH0065	CH20617
Diethylphthalate	ND (10.6)		1	08/08/12 0:03	CVH0065	CH20617
Dimethylphthalate	ND (10.6)		1	08/08/12 0:03	CVH0065	CH20617
Di-n-butylphthalate	ND (10.6)		1	08/08/12 0:03	CVH0065	CH20617
Di-n-octylphthalate	ND (10.6)		1	08/08/12 0:03	CVH0065	CH20617
Fluoranthene	ND (10.6)		1	08/08/12 0:03	CVH0065	CH20617
Fluorene	ND (10.6)		1	08/08/12 0:03	CVH0065	CH20617
Hexachlorobenzene	ND (10.6)		1	08/08/12 0:03	CVH0065	CH20617
Hexachlorobutadiene	ND (10.6)		1	08/08/12 0:03	CVH0065	CH20617
Hexachlorocyclopentadiene	ND (26.6)		1	08/08/12 0:03	CVH0065	CH20617
Hexachloroethane	ND (5.3)		1	08/08/12 0:03	CVH0065	CH20617
Indeno(1,2,3-cd)Pyrene	ND (10.6)		1	08/08/12 0:03	CVH0065	CH20617

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Wyman Gordon West PCB
Client Sample ID: WPCBW-1
Date Sampled: 08/02/12 12:45
Percent Solids: N/A
Initial Volume: 940
Final Volume: 1
Extraction Method: 3520C

ESS Laboratory Work Order: 1208043
ESS Laboratory Sample ID: 1208043-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: IBM
Prepared: 8/6/12 18:30

8270C Semi-Volatile Organic Compounds

Analyte	Results (MRL)	Limit	DF	Analyzed	Sequence	Batch
Isophorone	ND (10.6)		1	08/08/12 0:03	CVH0065	CH20617
Naphthalene	ND (10.6)		1	08/08/12 0:03	CVH0065	CH20617
Nitrobenzene	ND (10.6)		1	08/08/12 0:03	CVH0065	CH20617
N-Nitrosodimethylamine	ND (10.6)		1	08/08/12 0:03	CVH0065	CH20617
N-Nitroso-Di-n-Propylamine	ND (10.6)		1	08/08/12 0:03	CVH0065	CH20617
N-nitrosodiphenylamine	ND (10.6)		1	08/08/12 0:03	CVH0065	CH20617
Pentachlorophenol	ND (53.2)		1	08/08/12 0:03	CVH0065	CH20617
Phenanthrene	ND (10.6)		1	08/08/12 0:03	CVH0065	CH20617
Phenol	ND (10.6)		1	08/08/12 0:03	CVH0065	CH20617
Pyrene	ND (10.6)		1	08/08/12 0:03	CVH0065	CH20617
Pyridine	ND (106)		1	08/08/12 0:03	CVH0065	CH20617

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*68 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*103 %*		*15-110*
Surrogate: 2-Chlorophenol-d4	*84 %*		*15-110*
Surrogate: 2-Fluorobiphenyl	*61 %*		*30-130*
Surrogate: 2-Fluorophenol	*68 %*		*15-110*
Surrogate: Nitrobenzene-d5	*78 %*		*30-130*
Surrogate: Phenol-d6	*88 %*		*15-110*
Surrogate: p-Terphenyl-d14	*37 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Wyman Gordon West PCB
Client Sample ID: WPCBW-1
Date Sampled: 08/02/12 12:45
Percent Solids: N/A

ESS Laboratory Work Order: 1208043
ESS Laboratory Sample ID: 1208043-01
Sample Matrix: Ground Water

Classical Chemistry

Analyte	Results (MRL)	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Chloride	**0.9** (0.5)	300.0		1	EEM	08/08/12 15:45	mg/L	CH20808
Hexavalent Chromium	ND (10)	7196A		1	JLM	08/02/12 18:30	ug/L	CH20233
Total Cyanide (LL)	ND (5.0)	4500 CN CE		1	EEM	08/08/12 14:10	ug/L	CH20810
Total Petroleum Hydrocarbon	ND (5)	1664A		1	GAB	08/06/12 13:00	mg/L	CH20605
Total Residual Chlorine	**HT** ND (0.02)	4500Cl D		1	EEM	08/02/12 18:50	mg/L	CH20232
Total Suspended Solids	**760** (33)	2540D		1	GAB	08/06/12 16:40	mg/L	CH20604

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Wyman Gordon West PCB
Client Sample ID: WPCBW-1
Date Sampled: 08/02/12 12:45
Percent Solids: N/A
Initial Volume: 25
Final Volume: 25
Extraction Method: 5030

ESS Laboratory Work Order: 1208043
ESS Laboratory Sample ID: 1208043-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: MQS

8260B Volatile Organic Compounds

Analyte	Results (MRL)	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (1.0)		1	08/04/12 5:49	N2H0005	NH20304
1,1,1-Trichloroethane	ND (1.0)		1	08/04/12 5:49	N2H0005	NH20304
1,1,2,2-Tetrachloroethane	ND (1.0)		1	08/04/12 5:49	N2H0005	NH20304
1,1,2-Trichloroethane	ND (1.0)		1	08/04/12 5:49	N2H0005	NH20304
1,1-Dichloroethane	ND (1.0)		1	08/04/12 5:49	N2H0005	NH20304
1,1-Dichloroethene	ND (1.0)		1	08/04/12 5:49	N2H0005	NH20304
1,1-Dichloropropene	ND (2.0)		1	08/04/12 5:49	N2H0005	NH20304
1,2,3-Trichlorobenzene	ND (1.0)		1	08/04/12 5:49	N2H0005	NH20304
1,2,3-Trichloropropane	ND (1.0)		1	08/04/12 5:49	N2H0005	NH20304
1,2,4-Trichlorobenzene	ND (1.0)		1	08/04/12 5:49	N2H0005	NH20304
1,2,4-Trimethylbenzene	ND (1.0)		1	08/04/12 5:49	N2H0005	NH20304
1,2-Dibromo-3-Chloropropane	ND (5.0)		1	08/04/12 5:49	N2H0005	NH20304
1,2-Dibromoethane	ND (1.0)		1	08/04/12 5:49	N2H0005	NH20304
1,2-Dichlorobenzene	ND (1.0)		1	08/04/12 5:49	N2H0005	NH20304
1,2-Dichloroethane	ND (1.0)		1	08/04/12 5:49	N2H0005	NH20304
1,2-Dichloropropane	ND (1.0)		1	08/04/12 5:49	N2H0005	NH20304
1,3,5-Trimethylbenzene	ND (1.0)		1	08/04/12 5:49	N2H0005	NH20304
1,3-Dichlorobenzene	ND (1.0)		1	08/04/12 5:49	N2H0005	NH20304
1,3-Dichloropropane	ND (1.0)		1	08/04/12 5:49	N2H0005	NH20304
1,4-Dichlorobenzene	ND (1.0)		1	08/04/12 5:49	N2H0005	NH20304
1,4-Dioxane	ND (500)		1	08/04/12 5:49	N2H0005	NH20304
2,2-Dichloropropane	ND (1.0)		1	08/04/12 5:49	N2H0005	NH20304
2-Butanone	ND (10.0)		1	08/04/12 5:49	N2H0005	NH20304
2-Chlorotoluene	ND (1.0)		1	08/04/12 5:49	N2H0005	NH20304
2-Hexanone	ND (10.0)		1	08/04/12 5:49	N2H0005	NH20304
4-Chlorotoluene	ND (1.0)		1	08/04/12 5:49	N2H0005	NH20304
4-Isopropyltoluene	ND (1.0)		1	08/04/12 5:49	N2H0005	NH20304
4-Methyl-2-Pentanone	ND (25.0)		1	08/04/12 5:49	N2H0005	NH20304
Acetone	ND (10.0)		1	08/04/12 5:49	N2H0005	NH20304
Benzene	ND (1.0)		1	08/04/12 5:49	N2H0005	NH20304
Bromobenzene	ND (2.0)		1	08/04/12 5:49	N2H0005	NH20304

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Wyman Gordon West PCB
Client Sample ID: WPCBW-1
Date Sampled: 08/02/12 12:45
Percent Solids: N/A
Initial Volume: 25
Final Volume: 25
Extraction Method: 5030

ESS Laboratory Work Order: 1208043
ESS Laboratory Sample ID: 1208043-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: MQS

8260B Volatile Organic Compounds

Analyte	Results (MRL)	Limit	DF	Analyzed	Sequence	Batch
Bromochloromethane	ND (1.0)		1	08/04/12 5:49	N2H0005	NH20304
Bromodichloromethane	ND (1.0)		1	08/04/12 5:49	N2H0005	NH20304
Bromoform	ND (1.0)		1	08/04/12 5:49	N2H0005	NH20304
Bromomethane	ND (2.0)		1	08/04/12 5:49	N2H0005	NH20304
Carbon Disulfide	ND (1.0)		1	08/04/12 5:49	N2H0005	NH20304
Carbon Tetrachloride	ND (1.0)		1	08/04/12 5:49	N2H0005	NH20304
Chlorobenzene	ND (1.0)		1	08/04/12 5:49	N2H0005	NH20304
Chloroethane	ND (2.0)		1	08/04/12 5:49	N2H0005	NH20304
Chloroform	ND (1.0)		1	08/04/12 5:49	N2H0005	NH20304
Chloromethane	ND (2.0)		1	08/04/12 5:49	N2H0005	NH20304
cis-1,2-Dichloroethene	ND (1.0)		1	08/04/12 5:49	N2H0005	NH20304
cis-1,3-Dichloropropene	ND (1.0)		1	08/04/12 5:49	N2H0005	NH20304
Dibromochloromethane	ND (1.0)		1	08/04/12 5:49	N2H0005	NH20304
Dibromomethane	ND (1.0)		1	08/04/12 5:49	N2H0005	NH20304
Dichlorodifluoromethane	ND (2.0)		1	08/04/12 5:49	N2H0005	NH20304
Diethyl Ether	ND (1.0)		1	08/04/12 5:49	N2H0005	NH20304
Di-isopropyl ether	ND (1.0)		1	08/04/12 5:49	N2H0005	NH20304
Ethyl tertiary-butyl ether	ND (1.0)		1	08/04/12 5:49	N2H0005	NH20304
Ethylbenzene	ND (1.0)		1	08/04/12 5:49	N2H0005	NH20304
Hexachlorobutadiene	ND (1.0)		1	08/04/12 5:49	N2H0005	NH20304
Isopropylbenzene	ND (1.0)		1	08/04/12 5:49	N2H0005	NH20304
Methyl tert-Butyl Ether	ND (1.0)		1	08/04/12 5:49	N2H0005	NH20304
Methylene Chloride	ND (2.0)		1	08/04/12 5:49	N2H0005	NH20304
Naphthalene	ND (1.0)		1	08/04/12 5:49	N2H0005	NH20304
n-Butylbenzene	ND (1.0)		1	08/04/12 5:49	N2H0005	NH20304
n-Propylbenzene	ND (1.0)		1	08/04/12 5:49	N2H0005	NH20304
sec-Butylbenzene	ND (1.0)		1	08/04/12 5:49	N2H0005	NH20304
Styrene	ND (1.0)		1	08/04/12 5:49	N2H0005	NH20304
tert-Butylbenzene	ND (1.0)		1	08/04/12 5:49	N2H0005	NH20304
Tertiary-amyl methyl ether	ND (2.0)		1	08/04/12 5:49	N2H0005	NH20304
Tertiary-butyl Alcohol	ND (25.0)		1	08/04/12 5:49	N2H0005	NH20304

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Wyman Gordon West PCB
Client Sample ID: WPCBW-1
Date Sampled: 08/02/12 12:45
Percent Solids: N/A
Initial Volume: 25
Final Volume: 25
Extraction Method: 5030

ESS Laboratory Work Order: 1208043
ESS Laboratory Sample ID: 1208043-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: MQS

8260B Volatile Organic Compounds

Analyte	Results (MRL)	Limit	DF	Analyzed	Sequence	Batch
Tetrachloroethene	ND (1.0)		1	08/04/12 5:49	N2H0005	NH20304
Tetrahydrofuran	ND (5.0)		1	08/04/12 5:49	N2H0005	NH20304
Toluene	ND (1.0)		1	08/04/12 5:49	N2H0005	NH20304
trans-1,2-Dichloroethene	ND (1.0)		1	08/04/12 5:49	N2H0005	NH20304
trans-1,3-Dichloropropene	ND (1.0)		1	08/04/12 5:49	N2H0005	NH20304
Trichloroethene	ND (1.0)		1	08/04/12 5:49	N2H0005	NH20304
Trichlorofluoromethane	ND (1.0)		1	08/04/12 5:49	N2H0005	NH20304
Vinyl Chloride	ND (1.0)		1	08/04/12 5:49	N2H0005	NH20304
Xylene O	ND (1.0)		1	08/04/12 5:49	N2H0005	NH20304
Xylene P,M	ND (2.0)		1	08/04/12 5:49	N2H0005	NH20304

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*97 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*92 %*		*70-130*
Surrogate: Dibromofluoromethane	*97 %*		*70-130*
Surrogate: Toluene-d8	*98 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Wyman Gordon West PCB

ESS Laboratory Work Order: 1208043

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
3005A/3020A/6000/7000 Total Metals										
Batch CH20302 - 3005A										
Blank										
Antimony	ND	2.5	ug/L							
Arsenic	ND	2.5	ug/L							
Cadmium	ND	.5	ug/L							
Chromium	ND	10	ug/L							
Copper	ND	10	ug/L							
Iron	ND	50	ug/L							
Lead	ND	10	ug/L							
Nickel	ND	25	ug/L							
Selenium	ND	5	ug/L							
Silver	ND	5	ug/L							
Zinc	ND	5	ug/L							
LCS										
Cadmium	127	.5	ug/L	125.0		102	80-120			
Chromium	65	10	ug/L	50.0		106	80-120			
Copper	60	10	ug/L	50.0		104	80-120			
Iron	1320	50	ug/L	1250		106	80-120			
Lead	60	10	ug/L	50.0		104	80-120			
Nickel	262	25	ug/L	50.0		105	80-120			
Selenium	519	25	ug/L	500.0		104	80-120			
Silver	131	5	ug/L	125.0		105	80-120			
Zinc	260	5	ug/L	50.0		104	80-120			
LCS										
Antimony	9.9	.5	ug/L	10.00		99	80-120			
Arsenic	9.8	.5	ug/L	10.00		98	80-120			
LCS Dup										
Cadmium	128	.5	ug/L	125.0		102	80-120	0.6	0	
Chromium	269	10	ug/L	50.0		107	80-120	1	0	
Copper	264	10	ug/L	50.0		106	80-120		0	
Iron	1340	50	ug/L	1250		107	80-120		0	
Lea□	60	10	ug/L	50.0		104	80-120	0.2	0	
Nickel	266	25	ug/L	50.0		106	80-120	1	0	
Selenium	514	5	ug/L	500.0		103	80-120	0.9	0	
Silver	132	5	ug/L	125.0		105	80-120	0.8	0	
Zinc	260	5	ug/L	50.0		104	80-120	0.03	0	
LCS Dup										
Antimony	10.6	2.5	ug/L	10.00		106	80-120	6	0	
Arsenic	10.4	.5	ug/L	10.00		104	80-120	6	0	
Batch CH20315 - 245.1/7470A										
Blank										
Mercury	ND	0.20	ug/L							
LCS										
Mercury	6.73	0.20	ug/L	6.000		112	80-120			

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
3005A/3020A/6000/7000 Total Metals										
Batch CH20315 - 245.1/7470A										
LCS Dup										
Mercury	6.55	0.20	ug/L	6.000		109	80-120	3	0	
8082A Polychlorinated Biphenyls (PCB)										
Batch CH20228 - 3510C										
Blank										
Aroclor 1016	ND	0.50	ug/L							
Aroclor 1016 (1)	ND	0.50	ug/L							
Aroclor 1016 (1) [2C]	ND	0.50	ug/L							
Aroclor 1016 (2)	ND	0.50	ug/L							
Aroclor 1016 (2) [2C]	ND	0.50	ug/L							
Aroclor 1016 (3)	ND	0.50	ug/L							
Aroclor 1016 (3) [2C]	ND	0.50	ug/L							
Aroclor 1016 (4)	ND	0.50	ug/L							
Aroclor 1016 (4) [2C]	ND	0.50	ug/L							
Aroclor 1016 (5)	ND	0.50	ug/L							
Aroclor 1016 (5) [2C]	ND	0.50	ug/L							
Aroclor 12 1	ND	0.50	ug/L							
Aroclor 12 1 (1)	ND	0.50	ug/L							
Aroclor 12 1 (1) [2C]	ND	0.50	ug/L							
Aroclor 12 1 (2)	ND	0.50	ug/L							
Aroclor 12 1 (2) [2C]	ND	0.50	ug/L							
Aroclor 12 1 (3)	ND	0.50	ug/L							
Aroclor 12 1 (3) [2C]	ND	0.50	ug/L							
Aroclor 12 1 (4)	ND	0.50	ug/L							
Aroclor 12 1 (4) [2C]	ND	0.50	ug/L							
Aroclor 12 1 (5)	ND	0.50	ug/L							
Aroclor 12 1 (5) [2C]	ND	0.50	ug/L							
Aroclor 1232	ND	0.50	ug/L							
Aroclor 1232 (1)	ND	0.50	ug/L							
Aroclor 1232 (1) [2C]	ND	0.50	ug/L							
Aroclor 1232 (2)	ND	0.50	ug/L							
Aroclor 1232 (2) [2C]	ND	0.50	ug/L							
Aroclor 1232 (3)	ND	0.50	ug/L							
Aroclor 1232 (3) [2C]	ND	0.50	ug/L							
Aroclor 1232 (4)	ND	0.50	ug/L							
Aroclor 1232 (4) [2C]	ND	0.50	ug/L							
Aroclor 1232 (5)	ND	0.50	ug/L							
Aroclor 1232 (5) [2C]	ND	0.50	ug/L							
Aroclor 1242	ND	0.50	ug/L							
Aroclor 1242 (1)	ND	0.50	ug/L							
Aroclor 1242 (1) [2C]	ND	0.50	ug/L							
Aroclor 1242 (2)	ND	0.50	ug/L							
Aroclor 1242 (2) [2C]	ND	0.50	ug/L							
Aroclor 1242 (3)	ND	0.50	ug/L							

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8082A Polychlorinated Biphenyls (PCB)										
Batch CH20228 - 3510C										
Aroclor 1242 (3) [2C]	ND	0.50	ug/L							
Aroclor 1242 (4)	ND	0.50	ug/L							
Aroclor 1242 (4) [2C]	ND	0.50	ug/L							
Aroclor 1242 (5)	ND	0.50	ug/L							
Aroclor 1242 (5) [2C]	ND	0.50	ug/L							
Aroclor 1248	ND	0.50	ug/L							
Aroclor 1248 (1)	ND	0.50	ug/L							
Aroclor 1248 (1) [2C]	ND	0.50	ug/L							
Aroclor 1248 (2)	ND	0.50	ug/L							
Aroclor 1248 (2) [2C]	ND	0.50	ug/L							
Aroclor 1248 (3)	ND	0.50	ug/L							
Aroclor 1248 (3) [2C]	ND	0.50	ug/L							
Aroclor 1248 (4)	ND	0.50	ug/L							
Aroclor 1248 (4) [2C]	ND	0.50	ug/L							
Aroclor 1248 (5)	ND	0.50	ug/L							
Aroclor 1248 (5) [2C]	ND	0.50	ug/L							
Aroclor 1254	ND	0.50	ug/L							
Aroclor 1254 (1)	ND	0.50	ug/L							
Aroclor 1254 (1) [2C]	ND	0.50	ug/L							
Aroclor 1254 (2)	ND	0.50	ug/L							
Aroclor 1254 (2) [2C]	ND	0.50	ug/L							
Aroclor 1254 (3)	ND	0.50	ug/L							
Aroclor 1254 (3) [2C]	ND	0.50	ug/L							
Aroclor 1254 (4)	ND	0.50	ug/L							
Aroclor 1254 (4) [2C]	ND	0.50	ug/L							
Aroclor 1254 (5)	ND	0.50	ug/L							
Aroclor 1254 (5) [2C]	ND	0.50	ug/L							
Aroclor 1260	ND	0.50	ug/L							
Aroclor 1260 (1)	ND	0.50	ug/L							
Aroclor 1260 (1) [2C]	ND	0.50	ug/L							
Aroclor 1260 (2)	ND	0.50	ug/L							
Aroclor 1260 (2) [2C]	ND	0.50	ug/L							
Aroclor 1260 (3)	ND	0.50	ug/L							
Aroclor 1260 (3) [2C]	ND	0.50	ug/L							
Aroclor 1260 (4)	ND	0.50	ug/L							
Aroclor 1260 (4) [2C]	ND	0.50	ug/L							
Aroclor 1260 (5)	ND	0.50	ug/L							
Aroclor 1260 (5) [2C]	ND	0.50	ug/L							
Aroclor 1262	ND	0.50	ug/L							
Aroclor 1262 (1)	ND	0.50	ug/L							
Aroclor 1262 (1) [2C]	ND	0.50	ug/L							
Aroclor 1262 (2)	ND	0.50	ug/L							
Aroclor 1262 (2) [2C]	ND	0.50	ug/L							
Aroclor 1262 (3)	ND	0.50	ug/L							
Aroclor 1262 (3) [2C]	ND	0.50	ug/L							

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Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8082A Polychlorinated Biphenyls (PCB)										
Batch CH20228 - 3510C										
Aroclor 1262 (4)	ND	0.50	ug/L							
Aroclor 1262 (4) [2C]	ND	0.50	ug/L							
Aroclor 1262 (5)	ND	0.50	ug/L							
Aroclor 1262 (5) [2C]	ND	0.50	ug/L							
Aroclor 1268	ND	0.50	ug/L							
Aroclor 1268 (1)	ND	0.50	ug/L							
Aroclor 1268 (1) [2C]	ND	0.50	ug/L							
Aroclor 1268 (2)	ND	0.50	ug/L							
Aroclor 1268 (2) [2C]	ND	0.50	ug/L							
Aroclor 1268 (3)	ND	0.50	ug/L							
Aroclor 1268 (3) [2C]	ND	0.50	ug/L							
Aroclor 1268 (4)	ND	0.50	ug/L							
Aroclor 1268 (4) [2C]	ND	0.50	ug/L							
Aroclor 1268 (5)	ND	0.50	ug/L							
Aroclor 1268 (5) [2C]	ND	0.50	ug/L							
Surrogate: Decachlorobiphenyl	*0.237*		ug/L	*0.2500*		*95*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.237*		ug/L	*0.2500*		*95*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.240*		ug/L	*0.2500*		*96*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.281*		ug/L	*0.2500*		*112*	*30-150*			
LCS										
Aroclor 1016	6.39	0.50	ug/L	5.000		128	40-140			
Aroclor 1260	6.14	0.50	ug/L	5.000		123	40-140			
Surrogate: Decachlorobiphenyl	*0.2*		ug/L	*0.2500*		*89*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.219*		ug/L	*0.2500*		*88*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.244*		ug/L	*0.2500*		*98*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.283*		ug/L	*0.2500*		*113*	*30-150*			
LCS Dup										
Aroclor 1016	6.39	0.50	ug/L	5.000		128	40-140	0.02	0	
Aroclor 1260	6.26	0.50	ug/L	5.000		125	40-140		0	
Surrogate: Decachlorobiphenyl	*0.2 8*		ug/L	*0.2500*		*91*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.2 6*		ug/L	*0.2500*		*91*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.242*		ug/L	*0.2500*		*97*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.272*		ug/L	*0.2500*		*109*	*30-150*			
8270C Semi-Volatile Organic Compounds										
Batch CH20617 - 3520C										
Blank										
1,1-Biphenyl	ND	10.0	ug/L							
1,2,4-Trichlorobenzene	ND	10.0	ug/L							
1,2-Dichlorobenzene	ND	10.0	ug/L							
1,3-Dichlorobenzene	ND	10.0	ug/L							
1,4-Dichlorobenzene	ND	10.0	ug/L							

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270C Semi-Volatile Organic Compounds										
Batch CH20617 - 3520C										
,3,4,6-Tetrachlorophenol	ND	50.0	ug/L							
2,4,5-Trichlorophenol	ND	10.0	ug/L							
2,4,6-Trichlorophenol	ND	10.0	ug/L							
2,4-Dichlorophenol	ND	10.0	ug/L							
2,4-Dimethylphenol	ND	50.0	ug/L							
2,4-Dinitrophenol	ND	50.0	ug/L							
2,4-Dinitrotoluene	ND	10.0	ug/L							
2,6-Dinitrotoluene	ND	10.0	ug/L							
2-Chloronaphthalene	ND	10.0	ug/L							
2-Chlorophenol	ND	10.0	ug/L							
2-Methylnaphthalene	ND	10.0	ug/L							
2-Methylphenol	ND	10.0	ug/L							
2-Nitroaniline	ND	10.0	ug/L							
2-Nitrophenol	ND	10.0	ug/L							
3,3´-Dichlorobenzidine	ND	20.0	ug/L							
3+4-Methylphenol	ND	0.0	ug/L							
3-Nitroaniline	ND	10.0	ug/L							
4,6-Dinitro-2-Methylphenol	ND	50.0	ug/L							
4-Bromophenyl-phenylether	ND	10.0	ug/L							
4-Chloro-3-Methylphenol	ND	10.0	ug/L							
4-Chloroaniline	ND	0.0	ug/L							
4-Chloro-phenyl-phenyl ether	ND	10.0	ug/L							
4-Nitroaniline	ND	10.0	ug/L							
4-Nitrophenol	ND	50.0	ug/L							
Acenaphthene	ND	10.0	ug/L							
Acenaphthylene	ND	10.0	ug/L							
Acetophenone	ND	10.0	ug/L							
Aniline	ND	10.0	ug/L							
Anthracene	ND	10.0	ug/L							
Azobenzene	ND	0.0	ug/L							
Benzo(a)anthracene	ND	10.0	ug/L							
Benzo(a)pyrene	ND	10.0	ug/L							
Benzo(b)fluoranthene	ND	10.0	ug/L							
Benzo(g,h,i)perylene	ND	10.0	ug/L							
Benzo(k)fluoranthene	ND	10.0	ug/L							
Benzoic Acid	ND	100	ug/L							
Benzyl Alcohol	ND	10.0	ug/L							
bis(2-Chloroethoxy)methane	ND	10.0	ug/L							
bis(2-Chloroethyl)ether	ND	10.0	ug/L							
bis(2-chloroisopropyl)Ether	ND	10.0	ug/L							
bis(2-Ethylhexyl)phthalate	ND	6.0	ug/L							
Butylbenzylphthalate	ND	10.0	ug/L							
Carbazole	ND	10.0	ug/L							
Chrysene	ND	10.0	ug/L							
Dibenzo(a,h)Anthracene	ND	10.0	ug/L							

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Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270C Semi-Volatile Organic Compounds										
Batch CH20617 - 3520C										
Dibenzofuran	ND	10.0	ug/L							
Diethylphthalate	ND	10.0	ug/L							
Dimethylphthalate	ND	10.0	ug/L							
Di-n-butylphthalate	ND	10.0	ug/L							
Di-n-octylphthalate	ND	10.0	ug/L							
Fluoranthene	ND	10.0	ug/L							
Fluorene	ND	10.0	ug/L							
Hexachlorobenzene	ND	10.0	ug/L							
Hexachlorobutadiene	ND	10.0	ug/L							
Hexachlorocyclopentadiene	ND	5.0	ug/L							
Hexachloroethane	ND	5.0	ug/L							
Indeno(1,2,3-cd)Pyrene	ND	10.0	ug/L							
Isophorone	ND	10.0	ug/L							
Naphthalene	ND	10.0	ug/L							
Nitrobenzene	ND	10.0	ug/L							
N-Nitrosodimethylamine	ND	10.0	ug/L							
N-Nitroso-Di-n-Propylamine	ND	10.0	ug/L							
N-nitrosodiphenylamine	ND	10.0	ug/L							
Pentachlorophenol	ND	50.0	ug/L							
Phenanthrene	ND	10.0	ug/L							
Phenol	ND	10.0	ug/L							
Pyrene	ND	10.0	ug/L							
Pyridine	ND	100	ug/L							
Surrogate: 1,2-Dichlorobenzene-d4	*65.1*		ug/L	*100.0*		*65*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*157*		ug/L	*150.0*		*105*	*15-110*			
Surrogate: 2-Chlorophenol-d4	*120*		ug/L	*150.0*		*80*	*15-110*			
Surrogate: 2-Fluorobiphenyl	*69.1*		ug/L	*100.0*		*69*	*30-130*			
Surrogate: 2-Fluorophenol	*103*		ug/L	*150.0*		*69*	*15-110*			
Surrogate: Nitrobenzene-d5	*69.5*		ug/L	*100.0*		*70*	*30-130*			
Surrogate: Phenol-d6	*124*		ug/L	*150.0*		*83*	*15-110*			
Surrogate: p-Terphenyl-d14	*94.7*		ug/L	*100.0*		*95*	*30-130*			
LCS										
1,1-Biphenyl	72.2	10.0	ug/L	100.0		72	40-140			
1,2,4-Trichlorobenzene	59.5	10.0	ug/L	100.0		59	40-140			
1,2-Dichlorobenzene	60.9	10.0	ug/L	100.0		61	40-140			
1,3-Dichlorobenzene	57.1	10.0	ug/L	100.0		57	40-140			
1,4-Dichlorobenzene	59.4	10.0	ug/L	100.0		59	40-140			
,3,4,6-Tetrachlorophenol	85.9	50.0	ug/L	100.0		86	40-140			
,4,5-Trichlorophenol	80.7	10.0	ug/L	100.0		81	30-130			
,4,6-Trichlorophenol	74.7	10.0	ug/L	100.0		75	30-130			
,4-Dichlorophenol	66.9	10.0	ug/L	100.0		67	30-130			
,4-Dimethylphenol	70.1	50.0	ug/L	100.0		70	30-130			
,4-Dinitrophenol	72.0	50.0	ug/L	100.0		72	30-130			
,4-Dinitrotoluene	86.4	10.0	ug/L	100.0		86	40-140			
,6-Dinitrotoluene	84.7	10.0	ug/L	100.0		85	40-140			

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Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270C Semi-Volatile Organic Compounds										
Batch CH20617 - 3520C										
-Chloronaphthalene	66.4	10.0	ug/L	100.0		66	40-140			
-Chlorophenol	55.4	10.0	ug/L	100.0		55	30-130			
-Methylnaphthalene	69.1	10.0	ug/L	100.0		69	40-140			
-Methylphenol	64.5	10.0	ug/L	100.0		65	30-130			
-Nitroaniline	75.3	10.0	ug/L	100.0		75	40-140			
-Nitrophenol	62.0	10.0	ug/L	100.0		62	30-130			
3,3´-Dichlorobenzidine	89.6	20.0	ug/L	100.0		90	40-140			
3+4-Methylphenol	136	0.0	ug/L	00.0		68	30-130			
3-Nitroaniline	86.3	10.0	ug/L	100.0		86	40-140			
4,6-Dinitro-2-Methylphenol	83.5	50.0	ug/L	100.0		83	30-130			
4-Bromophenyl-phenylether	86.2	10.0	ug/L	100.0		86	40-140			
4-Chloro-3-Methylphenol	77.6	10.0	ug/L	100.0		78	30-130			
4-Chloroaniline	61.5	0.0	ug/L	100.0		61	40-140			
4-Chloro-phenyl-phenyl ether	80.2	10.0	ug/L	100.0		80	40-140			
4-Nitroaniline	93.6	10.0	ug/L	100.0		94	40-140			
4-Nitrophenol	88.7	50.0	ug/L	100.0		89	30-130			
Acenaphthene	79.6	10.0	ug/L	100.0		80	40-140			
Acenaphthylene	70.6	10.0	ug/L	100.0		71	40-140			
Acetophenone	68.6	10.0	ug/L	100.0		69	40-140			
Aniline	55.8	10.0	ug/L	100.0		56	40-140			
Anthracene	90.7	10.0	ug/L	100.0		91	40-140			
Azobenzene	79.0	0.0	ug/L	100.0		79	40-140			
Benzo(a)anthracene	92.5	10.0	ug/L	100.0		93	40-140			
Benzo(a)pyrene	82.0	10.0	ug/L	100.0		82	40-140			
Benzo(b)fluoranthene	95.4	10.0	ug/L	100.0		95	40-140			
Benzo(g,h,i)perylene	95.2	10.0	ug/L	100.0		95	40-140			
Benzo(k)fluoranthene	91.6	10.0	ug/L	100.0		92	40-140			
Benzoic Aci□	58.7	100	ug/L	100.0		59	40-140			
Benzyl Alcohol	67.6	10.0	ug/L	100.0		68	40-140			
bis(2-Chloroethoxy)methane	66.4	10.0	ug/L	100.0		66	40-140			
bis(2-Chloroethyl)ether	65.1	10.0	ug/L	100.0		65	40-140			
bis(2-chloroisopropyl)Ether	63.0	10.0	ug/L	100.0		63	40-140			
bis(2-Ethylhexyl)phthalate	94.0	6.0	ug/L	100.0		94	40-140			
Butylbenzylphthalate	91.0	10.0	ug/L	100.0		91	40-140			
Carbazole	88.3	10.0	ug/L	100.0		88	40-140			
Chrysene	90.3	10.0	ug/L	100.0		90	40-140			
Dibenzo(a,h)Anthracene	98.4	10.0	ug/L	100.0		98	40-140			
Dibenzofuran	78.0	10.0	ug/L	100.0		78	40-140			
Diethylphthalate	86.0	10.0	ug/L	100.0		86	40-140			
Dimethylphthalate	83.1	10.0	ug/L	100.0		83	40-140			
Di-n-butylphthalate	91.0	10.0	ug/L	100.0		91	40-140			
Di-n-octylphthalate	94.8	10.0	ug/L	100.0		95	40-140			
Fluoranthene	88.0	10.0	ug/L	100.0		88	40-140			
Fluorene	84.1	10.0	ug/L	100.0		84	40-140			
Hexachlorobenzene	83.3	10.0	ug/L	100.0		83	40-140			

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Client Name: GZA GeoEnvironmental, Inc.
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ESS Laboratory Work Order: 1208043

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270C Semi-Volatile Organic Compounds										
Batch CH20617 - 3520C										
Hexachlorobutadiene	60.7	10.0	ug/L	100.0		61	40-140			
Hexachlorocyclopentadiene	43.4	5.0	ug/L	100.0		43	40-140			
Hexachloroethane	56.6	5.0	ug/L	100.0		57	40-140			
Indeno(1,2,3-cd)Pyrene	94.3	10.0	ug/L	100.0		94	40-140			
Isophorone	67.0	10.0	ug/L	100.0		67	40-140			
Naphthalene	66.2	10.0	ug/L	100.0		66	40-140			
Nitrobenzene	64.2	10.0	ug/L	100.0		64	40-140			
N-Nitrosodimethylamine	60.5	10.0	ug/L	100.0		60	40-140			
N-Nitroso-Di-n-Propylamine	69.5	10.0	ug/L	100.0		69	40-140			
N-nitrosodiphenylamine	87.3	10.0	ug/L	100.0		87	40-140			
Pentachlorophenol	84.3	50.0	ug/L	100.0		84	30-130			
Phenanthrene	92.7	10.0	ug/L	100.0		93	40-140			
Phenol	57.4	10.0	ug/L	100.0		57	30-130			
Pyrene	93.7	10.0	ug/L	100.0		94	40-140			
Pyridine	46.2	100	ug/L	100.0		46	40-140			
Surrogate: 1,2-Dichlorobenzene-d4	*55.0*		ug/L	*100.0*		*55*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*151*		ug/L	*150.0*		*101*	*15-110*			
Surrogate: 2-Chlorophenol-d4	*91.4*		ug/L	*150.0*		*61*	*15-110*			
Surrogate: 2-Fluorobiphenyl	*65.3*		ug/L	*100.0*		*65*	*30-130*			
Surrogate: 2-Fluorophenol	*69.4*		ug/L	*150.0*		*46*	*15-110*			
Surrogate: Nitrobenzene-d5	*61.2*		ug/L	*100.0*		*61*	*30-130*			
Surrogate: Phenol-d6	*98.4*		ug/L	*150.0*		*66*	*15-110*			
Surrogate: p-Terphenyl-d14	*86.6*		ug/L	*100.0*		*87*	*30-130*			
LCS Dup										
1,1-Biphenyl	76.6	10.0	ug/L	100.0		77	40-140	6	0	
1,2,4-Trichlorobenzene	71.1	10.0	ug/L	100.0		71	40-140	18	0	
1,2-Dichlorobenzene	72.3	10.0	ug/L	100.0		72	40-140	17	0	
1,3-Dichlorobenzene	69.4	10.0	ug/L	100.0		69	40-140	19	0	
1,4-Dichlorobenzene	71.0	10.0	ug/L	100.0		71	40-140	18	0	
,3,4,6-Tetrachlorophenol	89.0	50.0	ug/L	100.0		89	40-140	4	0	
,4,5-Trichlorophenol	88.2	10.0	ug/L	100.0		88	30-130	9	0	
,4,6-Trichlorophenol	83.3	10.0	ug/L	100.0		83	30-130	11	0	
,4-Dichlorophenol	79.0	10.0	ug/L	100.0		79	30-130	17	0	
,4-Dimethylphenol	79.8	50.0	ug/L	100.0		80	30-130	13	0	
,4-Dinitrophenol	72.8	50.0	ug/L	100.0		73	30-130	1	0	
,4-Dinitrotoluene	89.2	10.0	ug/L	100.0		89	40-140	3	0	
,6-Dinitrotoluene	89.5	10.0	ug/L	100.0		90	40-140	6	0	
-Chloronaphthalene	72.9	10.0	ug/L	100.0		73	40-140	9	0	
-Chlorophenol	71.0	10.0	ug/L	100.0		71	30-130	5	0	D+
-Methylnaphthalene	78.2	10.0	ug/L	100.0		78	40-140	12	0	
-Methylphenol	76.6	10.0	ug/L	100.0		77	30-130	17	0	
-Nitroaniline	75.5	10.0	ug/L	100.0		75	40-140	0.2	0	
-Nitrophenol	77.4	10.0	ug/L	100.0		77	30-130		0	D+
3,3´-Dichlorobenzidine	88.2	0.0	ug/L	100.0		88	40-140		0	
3+4-Methylphenol	156	0.0	ug/L	00.0		78	30-130	13	0	

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Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270C Semi-Volatile Organic Compounds										
Batch CH20617 - 3520C										
3-Nitroaniline	85.9	10.0	ug/L	100.0		86	40-140	0.5	0	
4,6-Dinitro-2-Methylphenol	86.4	50.0	ug/L	100.0		86	30-130	3	0	
4-Bromophenyl-phenylether	89.1	10.0	ug/L	100.0		89	40-140	3	0	
4-Chloro-3-Methylphenol	86.0	10.0	ug/L	100.0		86	30-130	10	0	
4-Chloroaniline	68.9	0.0	ug/L	100.0		69	40-140	11	0	
4-Chloro-phenyl-phenyl ether	84.8	10.0	ug/L	100.0		85	40-140	6	0	
4-Nitroaniline	93.4	10.0	ug/L	100.0		93	40-140	0.3	0	
4-Nitrophenol	91.0	50.0	ug/L	100.0		91	30-130	3	0	
Acenaphthene	86.3	10.0	ug/L	100.0		86	40-140	8	0	
Acenaphthylene	77.2	10.0	ug/L	100.0		77	40-140	9	0	
Acetophenone	76.3	10.0	ug/L	100.0		76	40-140	11	0	
Aniline	63.3	10.0	ug/L	100.0		63	40-140	13	0	
Anthracene	95.1	10.0	ug/L	100.0		95	40-140	5	0	
Azobenzene	83.2	0.0	ug/L	100.0		83	40-140	5	0	
Benzo(a)anthracene	93.8	10.0	ug/L	100.0		94	40-140	1	0	
Benzo(a)pyrene	86.0	10.0	ug/L	100.0		86	40-140	5	0	
Benzo(b)fluoranthene	99.4	10.0	ug/L	100.0		99	40-140	4	0	
Benzo(g,h,i)perylene	98.5	10.0	ug/L	100.0		99	40-140	3	0	
Benzo(k)fluoranthene	92.9	10.0	ug/L	100.0		93	40-140	1	0	
Benzoic Aci□	65.6	100	ug/L	100.0		66	40-140	11	0	
Benzyl Alcohol	74.1	10.0	ug/L	100.0		74	40-140	9	0	
bis(2-Chloroethoxy)methane	77.8	10.0	ug/L	100.0		78	40-140	16	0	
bis(2-Chloroethyl)ether	75.6	10.0	ug/L	100.0		76	40-140	15	0	
bis(2-chloroisopropyl)Ether	73.5	10.0	ug/L	100.0		73	40-140	15	0	
bis(2-Ethylhexyl)phthalate	94.2	6.0	ug/L	100.0		94	40-140	0.3	0	
Butylbenzylphthalate	91.7	10.0	ug/L	100.0		92	40-140	0.8	0	
Carbazole	89.5	10.0	ug/L	100.0		90	40-140	1	0	
Chrysene	95.7	10.0	ug/L	100.0		96	40-140	6	0	
Dibenzo(a,h)Anthracene	102	10.0	ug/L	100.0		102	40-140	4	0	
Dibenzofuran	83.1	10.0	ug/L	100.0		83	40-140	6	0	
Diethylphthalate	88.4	10.0	ug/L	100.0		88	40-140	3	0	
Dimethylphthalate	86.6	10.0	ug/L	100.0		87	40-140	4	0	
Di-n-butylphthalate	92.1	10.0	ug/L	100.0		92	40-140	1	0	
Di-n-octylphthalate	96.1	10.0	ug/L	100.0		96	40-140	1	0	
Fluoranthene	90.0	10.0	ug/L	100.0		90	40-140		0	
Fluorene	89.5	10.0	ug/L	100.0		89	40-140	6	0	
Hexachlorobenzene	86.3	10.0	ug/L	100.0		86	40-140	4	0	
Hexachlorobutadiene	73.1	10.0	ug/L	100.0		73	40-140	19	0	
Hexachlorocyclopentadiene	50.5	5.0	ug/L	100.0		50	40-140	15	0	
Hexachloroethane	69.2	5.0	ug/L	100.0		69	40-140	0	0	
Indeno(1,2,3-cd)Pyrene	96.7	10.0	ug/L	100.0		97	40-140		0	
Isophorone	79.4	10.0	ug/L	100.0		79	40-140	17	0	
Naphthalene	78.0	10.0	ug/L	100.0		78	40-140	16	0	
Nitrobenzene	76.2	10.0	ug/L	100.0		76	40-140	17	0	
N-Nitrosodimethylamine	63.4	10.0	ug/L	100.0		63	40-140	5	0	

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270C Semi-Volatile Organic Compounds										
Batch CH20617 - 3520C										
N-Nitroso-Di-n-Propylamine	76.1	10.0	ug/L	100.0		76	40-140	9	0	
N-nitrosodiphenylamine	89.0	10.0	ug/L	100.0		89	40-140		0	
Pentachlorophenol	87.6	50.0	ug/L	100.0		88	30-130	4	0	
Phenanthrene	96.0	10.0	ug/L	100.0		96	40-140	4	0	
Phenol	69.9	10.0	ug/L	100.0		70	30-130	0	0	
Pyrene	97.3	10.0	ug/L	100.0		97	40-140	4	0	
Pyridine	55.9	100	ug/L	100.0		56	40-140	19	0	
Surrogate: 1,2-Dichlorobenzene-d4	*66.1*		ug/L	*100.0*		*66*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*156*		ug/L	*150.0*		*104*	*15-110*			
Surrogate: 2-Chlorophenol-d4	*118*		ug/L	*150.0*		*79*	*15-110*			
Surrogate: 2-Fluorobiphenyl	*71.0*		ug/L	*100.0*		*71*	*30-130*			
Surrogate: 2-Fluorophenol	*99.4*		ug/L	*150.0*		*66*	*15-110*			
Surrogate: Nitrobenzene-d5	*72.2*		ug/L	*100.0*		*72*	*30-130*			
Surrogate: Phenol-d6	*121*		ug/L	*150.0*		*81*	*15-110*			
Surrogate: p-Terphenyl-d14	*96.5*		ug/L	*100.0*		*96*	*30-130*			
Classical Chemistry										
Batch CH20232 - General Preparation										
Blank										
Total Residual Chlorine	ND	0.02	mg/L							
LCS										
Total Residual Chlorine	2.04		mg/L	.010		101	85-115			
Batch CH20233 - General Preparation										
Blank										
Hexavalent Chromium	ND	10	ug/L							
LCS										
Hexavalent Chromium	0.5		mg/L	0.4998		103	90-110			
LCS Dup										
Hexavalent Chromium	0.5		mg/L	0.4998		102	90-110	0.6	0	
Batch CH20604 - General Preparation										
Blank										
Total Suspended Solids	ND	5	mg/L							
LCS										
Total Suspended Solids	28		mg/L	31.90		88	80-120			
Batch CH20605 - General Preparation										
Blank										
Total Petroleum Hydrocarbon	ND	5	mg/L							
LCS										
Total Petroleum Hydrocarbon	20	5	mg/L	18.66		106	66-114			
Batch CH20808 - General Preparation										
Blank										
Chloride	ND	0.5	mg/L							

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Classical Chemistry										
Batch CH20808 - General Preparation										
LCS										
Chloride	2.4		mg/L	.500		97	90-110			
Batch CH20810 - TCN Prep										
Blank										
Total Cyanide (LL)	ND	5.0	ug/L							
LCS										
Total Cyanide (LL)	20.1	5.0	ug/L	0.06		100	90-110			
LCS										
Total Cyanide (LL)	145	5.0	ug/L	150.4		96	90-110			
LCS Dup										
Total Cyanide (LL)	145	5.0	ug/L	150.4		96	90-110	0.2	0	

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8260B Volatile Organic Compounds										
Batch NH20304 - 5030										
Blank										
1,1,1,2-Tetrachloroethane	ND	1.0	ug/L							
1,1,1-Trichloroethane	ND	1.0	ug/L							
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L							
1,1,2-Trichloroethane	ND	1.0	ug/L							
1,1-Dichloroethane	ND	1.0	ug/L							
1,1-Dichloroethene	ND	1.0	ug/L							
1,1-Dichloropropene	ND	.0	ug/L							
1,2,3-Trichlorobenzene	ND	1.0	ug/L							
1,2,3-Trichloropropane	ND	1.0	ug/L							
1,2,4-Trichlorobenzene	ND	1.0	ug/L							
1,2,4-Trimethylbenzene	ND	1.0	ug/L							
1,2-Dibromo-3-Chloropropane	ND	5.0	ug/L							
1,2-Dibromoethane	ND	1.0	ug/L							
1,2-Dichlorobenzene	ND	1.0	ug/L							
1,2-Dichloroethane	ND	1.0	ug/L							
1,2-Dichloropropane	ND	1.0	ug/L							
1,3,5-Trimethylbenzene	ND	1.0	ug/L							
1,3-Dichlorobenzene	ND	1.0	ug/L							
1,3-Dichloropropane	ND	1.0	ug/L							
1,4-Dichlorobenzene	ND	1.0	ug/L							
1,4-Dioxane	ND	500	ug/L							
,2-Dichloropropane	ND	1.0	ug/L							
2-Butanone	ND	10.0	ug/L							
2-Chlorotoluene	ND	1.0	ug/L							

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Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8260B Volatile Organic Compounds										
Batch NH20304 - 5030										
-Hexanone	ND	10.0	ug/L							
4-Chlorotoluene	ND	1.0	ug/L							
4-Isopropyltoluene	ND	1.0	ug/L							
4-Methyl-2-Pentanone	ND	5.0	ug/L							
Acetone	ND	10.0	ug/L							
Benzene	ND	1.0	ug/L							
Bromobenzene	ND	.0	ug/L							
Bromochloromethane	ND	1.0	ug/L							
Bromodichloromethane	ND	1.0	ug/L							
Bromoform	ND	1.0	ug/L							
Bromomethane	ND	.0	ug/L							
Carbon Disulfide	ND	1.0	ug/L							
Carbon Tetrachloride	ND	1.0	ug/L							
Chlorobenzene	ND	1.0	ug/L							
Chloroethane	ND	.0	ug/L							
Chloroform	ND	1.0	ug/L							
Chloromethane	ND	.0	ug/L							
cis-1,2-Dichloroethene	ND	1.0	ug/L							
cis-1,3-Dichloropropene	ND	1.0	ug/L							
Dibromochloromethane	ND	1.0	ug/L							
Dibromomethane	ND	1.0	ug/L							
Dichlorodifluoromethane	ND	.0	ug/L							
Diethyl Ether	ND	1.0	ug/L							
Di-isopropyl ether	ND	1.0	ug/L							
Ethyl tertiary-butyl ether	ND	1.0	ug/L							
Ethylbenzene	ND	1.0	ug/L							
Hexachlorobutadiene	ND	1.0	ug/L							
Isopropylbenzene	ND	1.0	ug/L							
Methyl tert-Butyl Ether	ND	1.0	ug/L							
Methylene Chloride	ND	.0	ug/L							
Naphthalene	ND	1.0	ug/L							
n-Butylbenzene	ND	1.0	ug/L							
n-Propylbenzene	ND	1.0	ug/L							
sec-Butylbenzene	ND	1.0	ug/L							
Styrene	ND	1.0	ug/L							
tert-Butylbenzene	ND	1.0	ug/L							
Tertiary-amyl methyl ether	ND	2.0	ug/L							
Tertiary-butyl Alcohol	ND	5.0	ug/L							
Tetrachloroethene	ND	1.0	ug/L							
Tetrahydrofuran	ND	5.0	ug/L							
Toluene	ND	1.0	ug/L							
trans-1,2-Dichloroethene	ND	1.0	ug/L							
trans-1,3-Dichloropropene	ND	1.0	ug/L							
Trichloroethene	ND	1.0	ug/L							
Trichlorofluoromethane	ND	1.0	ug/L							

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Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8260B Volatile Organic Compounds										
Batch NH20304 - 5030										
Vinyl Chloride	ND	1.0	ug/L							
Xylene O	ND	1.0	ug/L							
Xylene P,M	ND	.0	ug/L							
Surrogate: 1,2-Dichloroethane-d4	*10.2*		ug/L	*10.00*		*102*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*9.36*		ug/L	*10.00*		*94*	*70-130*			
Surrogate: Dibromofluoromethane	*9.89*		ug/L	*10.00*		*99*	*70-130*			
Surrogate: Toluene-d8	*9.86*		ug/L	*10.00*		*99*	*70-130*			
LCS										
1,1,1,2-Tetrachloroethane	19.0	1.0	ug/L	0.00		95	70-130			
1,1,1-Trichloroethane	18.7	1.0	ug/L	0.00		94	70-130			
1,1,2,2-Tetrachloroethane	19.8	1.0	ug/L	0.00		99	70-130			
1,1,2-Trichloroethane	20.0	1.0	ug/L	0.00		100	70-130			
1,1-Dichloroethane	19.3	1.0	ug/L	0.00		96	70-130			
1,1-Dichloroethene	18.5	1.0	ug/L	0.00		93	70-130			
1,1-Dichloropropene	18.6	.0	ug/L	0.00		93	70-130			
1,2,3-Trichlorobenzene	20.4	1.0	ug/L	0.00		102	70-130			
1,2,3-Trichloropropane	19.8	1.0	ug/L	0.00		99	70-130			
1,2,4-Trichlorobenzene	19.2	1.0	ug/L	0.00		96	70-130			
1,2,4-Trimethylbenzene	20.1	1.0	ug/L	0.00		100	70-130			
1,2-Dibromo-3-Chloropropane	18.7	5.0	ug/L	0.00		94	70-130			
1,2-Dibromoethane	20.1	1.0	ug/L	0.00		101	70-130			
1,2-Dichlorobenzene	20.2	1.0	ug/L	0.00		101	70-130			
1,2-Dichloroethane	19.1	1.0	ug/L	0.00		96	70-130			
1,2-Dichloropropane	20.2	1.0	ug/L	0.00		101	70-130			
1,3,5-Trimethylbenzene	20.1	1.0	ug/L	0.00		101	70-130			
1,3-Dichlorobenzene	19.8	1.0	ug/L	0.00		99	70-130			
1,3-Dichloropropane	19.4	1.0	ug/L	0.00		97	70-130			
1,4-Dichlorobenzene	19.7	1.0	ug/L	0.00		98	70-130			
,2-Dichloropropane	16.5	1.0	ug/L	20.00		83	70-130			
-Butanone	202	10.0	ug/L	200.0		101	70-130			
-Chlorotoluene	19.2	1.0	ug/L	20.00		96	70-130			
-Hexanone	215	10.0	ug/L	200.0		107	70-130			
4-Chlorotoluene	19.2	1.0	ug/L	0.00		96	70-130			
4-Isopropyltoluene	20.4	1.0	ug/L	0.00		102	70-130			
4-Methyl-2-Pentanone	209	5.0	ug/L	00.0		105	70-130			
Acetone	173	10.0	ug/L	00.0		87	70-130			
Benzene	19.1	1.0	ug/L	0.00		95	70-130			
Bromobenzene	19.5	.0	ug/L	0.00		98	70-130			
Bromochloromethane	20.4	1.0	ug/L	0.00		102	70-130			
Bromodichloromethane	18.1	1.0	ug/L	0.00		90	70-130			
Bromoform	19.5	1.0	ug/L	0.00		98	70-130			
Bromomethane	18.9	.0	ug/L	0.00		94	70-130			
Carbon Disulfide	16.7	1.0	ug/L	0.00		83	70-130			
Carbon Tetrachloride	18.9	1.0	ug/L	0.00		95	70-130			
Chlorobenzene	20.3	1.0	ug/L	0.00		102	70-130			

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Wyman Gordon West PCB

ESS Laboratory Work Order: 1208043

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8260B Volatile Organic Compounds										
Batch NH20304 - 5030										
Chloroethane	18.1	.0	ug/L	0.00		91	70-130			
Chloroform	18.6	1.0	ug/L	0.00		93	70-130			
Chloromethane	19.6	.0	ug/L	0.00		98	70-130			
cis-1,2-Dichloroethene	19.4	1.0	ug/L	0.00		97	70-130			
cis-1,3-Dichloropropene	19.5	1.0	ug/L	0.00		98	70-130			
Dibromochloromethane	20.6	1.0	ug/L	0.00		103	70-130			
Dibromomethane	20.0	1.0	ug/L	0.00		100	70-130			
Dichlorodifluoromethane	18.1	.0	ug/L	0.00		90	70-130			
Diethyl Ether	18.3	1.0	ug/L	0.00		92	70-130			
Di-isopropyl ether	19.2	1.0	ug/L	0.00		96	70-130			
Ethyl tertiary-butyl ether	18.1	1.0	ug/L	0.00		91	70-130			
Ethylbenzene	20.0	1.0	ug/L	0.00		100	70-130			
Hexachlorobutadiene	16.5	1.0	ug/L	0.00		82	70-130			
Isopropylbenzene	20.1	1.0	ug/L	0.00		101	70-130			
Methyl tert-Butyl Ether	16.9	1.0	ug/L	0.00		85	70-130			
Methylene Chloride	18.5	.0	ug/L	0.00		93	70-130			
Naphthalene	21.3	1.0	ug/L	0.00		107	70-130			
n-Butylbenzene	19.9	1.0	ug/L	0.00		100	70-130			
n-Propylbenzene	19.9	1.0	ug/L	0.00		100	70-130			
sec-Butylbenzene	20.1	1.0	ug/L	0.00		100	70-130			
Styrene	19.4	1.0	ug/L	0.00		97	70-130			
tert-Butylbenzene	19.9	1.0	ug/L	0.00		99	70-130			
Tertiary-amyl methyl ether	17.4	2.0	ug/L	0.00		87	70-130			
Tertiary-butyl Alcohol	88.9	5.0	ug/L	100.0		89	70-130			
Tetrachloroethene	20.9	1.0	ug/L	0.00		104	70-130			
Tetrahydrofuran	25.2	5.0	ug/L	0.00		126	70-130			
Toluene	19.6	1.0	ug/L	0.00		98	70-130			
trans-1,2-Dichloroethene	19.2	1.0	ug/L	0.00		96	70-130			
trans-1,3-Dichloropropene	16.8	1.0	ug/L	0.00		84	70-130			
Trichloroethene	20.5	1.0	ug/L	0.00		103	70-130			
Trichlorofluoromethane	18.2	1.0	ug/L	0.00		91	70-130			
Vinyl Chloride	17.7	1.0	ug/L	0.00		89	70-130			
Xylene O	19.3	1.0	ug/L	0.00		96	70-130			
Xylene P,M	39.1	.0	ug/L	40.00		98	70-130			
Surrogate: 1,2-Dichloroethane-d4	*9.60*		ug/L	*10.00*		*96*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*9.48*		ug/L	*10.00*		*95*	*70-130*			
Surrogate: Dibromofluoromethane	*9.41*		ug/L	*10.00*		*94*	*70-130*			
Surrogate: Toluene-d8	*9.72*		ug/L	*10.00*		*97*	*70-130*			
LCS Dup										
1,1,1,2-Tetrachloroethane	20.1	1.0	ug/L	0.00		101	70-130	6	5	
1,1,1-Trichloroethane	19.6	1.0	ug/L	0.00		98	70-130	4	5	
1,1,2,2-Tetrachloroethane	20.4	1.0	ug/L	0.00		102	70-130	3	5	
1,1,2-Trichloroethane	20.6	1.0	ug/L	0.00		103	70-130	3	5	
1,1-Dichloroethane	20.1	1.0	ug/L	0.00		101	70-130	4	5	
1,1-Dichloroethene	18.8	1.0	ug/L	0.00		94	70-130	1	5	

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Wyman Gordon West PCB

ESS Laboratory Work Order: 1208043

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8260B Volatile Organic Compounds										
Batch NH20304 - 5030										
1,1-Dichloropropene	19.2	.0	ug/L	0.00		96	70-130	3	5	
1,2,3-Trichlorobenzene	21.1	1.0	ug/L	0.00		106	70-130	4	5	
1,2,3-Trichloropropane	19.9	1.0	ug/L	0.00		99	70-130	0.6	5	
1,2,4-Trichlorobenzene	20.4	1.0	ug/L	0.00		102	70-130	6	5	
1,2,4-Trimethylbenzene	20.8	1.0	ug/L	0.00		104	70-130	3	5	
1,2-Dibromo-3-Chloropropane	19.2	5.0	ug/L	0.00		96	70-130		5	
1,2-Dibromoethane	20.9	1.0	ug/L	0.00		105	70-130	4	5	
1,2-Dichlorobenzene	20.7	1.0	ug/L	0.00		104	70-130	3	5	
1,2-Dichloroethane	19.6	1.0	ug/L	0.00		98	70-130		5	
1,2-Dichloropropane	21.2	1.0	ug/L	0.00		106	70-130	5	5	
1,3,5-Trimethylbenzene	21.1	1.0	ug/L	0.00		105	70-130	5	5	
1,3-Dichlorobenzene	20.5	1.0	ug/L	0.00		103	70-130	3	5	
1,3-Dichloropropane	19.8	1.0	ug/L	0.00		99	70-130		5	
1,4-Dichlorobenzene	20.4	1.0	ug/L	0.00		102	70-130	4	5	
,2-Dichloropropane	17.1	1.0	ug/L	20.00		86	70-130	4	5	
-Butanone	207	10.0	ug/L	200.0		103	70-130		5	
-Chlorotoluene	20.1	1.0	ug/L	20.00		101	70-130	5	5	
-Hexanone	215	10.0	ug/L	200.0		108	70-130	0.3	5	
4-Chlorotoluene	20.0	1.0	ug/L	0.00		100	70-130	4	5	
4-Isopropyltoluene	21.4	1.0	ug/L	0.00		107	70-130	5	5	
4-Methyl-2-Pentanone	213	5.0	ug/L	00.0		106	70-130		5	
Acetone	190	10.0	ug/L	00.0		95	70-130	9	5	
Benzene	19.7	1.0	ug/L	0.00		99	70-130	3	5	
Bromobenzene	20.1	.0	ug/L	0.00		100	70-130	3	5	
Bromochloromethane	20.7	1.0	ug/L	0.00		103	70-130		5	
Bromodichloromethane	19.1	1.0	ug/L	0.00		95	70-130	5	5	
Bromoform	19.5	1.0	ug/L	0.00		98	70-130	0.1	5	
Bromomethane	19.8	.0	ug/L	0.00		99	70-130	5	5	
Carbon Disulfide	17.6	1.0	ug/L	0.00		88	70-130	6	5	
Carbon Tetrachloride	19.6	1.0	ug/L	0.00		98	70-130	3	5	
Chlorobenzene	21.2	1.0	ug/L	0.00		106	70-130	4	5	
Chloroethane	19.1	.0	ug/L	0.00		96	70-130	5	5	
Chloroform	19.1	1.0	ug/L	0.00		96	70-130	3	5	
Chloromethane	19.8	.0	ug/L	0.00		99	70-130	1	5	
cis-1,2-Dichloroethene	20.4	1.0	ug/L	0.00		102	70-130	5	5	
cis-1,3-Dichloropropene	20.4	1.0	ug/L	0.00		102	70-130	4	5	
Dibromochloromethane	21.5	1.0	ug/L	0.00		108	70-130	5	5	
Dibromomethane	20.5	1.0	ug/L	0.00		103	70-130		5	
Dichlorodifluoromethane	18.1	.0	ug/L	0.00		91	70-130	0.2	5	
Diethyl Ether	18.9	1.0	ug/L	0.00		94	70-130	3	5	
Di-isopropyl ether	20.0	1.0	ug/L	0.00		100	70-130	4	5	
Ethyl tertiary-butyl ether	18.8	1.0	ug/L	0.00		94	70-130	4	5	
Ethylbenzene	21.2	1.0	ug/L	0.00		106	70-130	6	5	
Hexachlorobutadiene	20.6	1.0	ug/L	0.00		103	70-130		5	
Isopropylbenzene	20.8	1.0	ug/L	0.00		104	70-130	3	5	

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Wyman Gordon West PCB

ESS Laboratory Work Order: 1208043

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8260B Volatile Organic Compounds										
Batch NH20304 - 5030										
Methyl tert-Butyl Ether	17.6	1.0	ug/L	0.00		88	70-130	4	5	
Methylene Chloride	19.0	.0	ug/L	0.00		95	70-130	3	5	
Naphthalene	21.2	1.0	ug/L	0.00		106	70-130	0.6	5	
n-Butylbenzene	21.3	1.0	ug/L	0.00		106	70-130	6	5	
n-Propylbenzene	20.7	1.0	ug/L	0.00		103	70-130	4	5	
sec-Butylbenzene	21.3	1.0	ug/L	0.00		107	70-130	6	5	
Styrene	20.2	1.0	ug/L	0.00		101	70-130	4	5	
tert-Butylbenzene	20.7	1.0	ug/L	0.00		104	70-130	4	5	
Tertiary-amyl methyl ether	18.2	.0	ug/L	0.00		91	70-130	5	5	
Tertiary-butyl Alcohol	93.1	5.0	ug/L	100.0		93	70-130	5	5	
Tetrachloroethene	21.4	1.0	ug/L	0.00		107	70-130		5	
Tetrahydrofuran	23.1	5.0	ug/L	0.00		116	70-130	9	5	
Toluene	20.6	1.0	ug/L	0.00		103	70-130	5	5	
trans-1,2-Dichloroethene	20.6	1.0	ug/L	0.00		103	70-130	7	5	
trans-1,3-Dichloropropene	17.1	1.0	ug/L	0.00		86	70-130		5	
Trichloroethene	21.2	1.0	ug/L	0.00		106	70-130	3	5	
Trichlorofluoromethane	19.4	1.0	ug/L	0.00		97	70-130	6	5	
Vinyl Chloride	18.5	1.0	ug/L	0.00		93	70-130	4	5	
Xylene O	20.4	1.0	ug/L	0.00		102	70-130	5	5	
Xylene P,M	41.1	.0	ug/L	40.00		103	70-130	5	5	
Surrogate: 1,2-Dichloroethane-d4	*9.72*		ug/L	*10.00*		*97*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*9.75*		ug/L	*10.00*		*98*	*70-130*			
Surrogate: Dibromofluoromethane	*9.81*		ug/L	*10.00*		*98*	*70-130*			
Surrogate: Toluene-d8	*9.87*		ug/L	*10.00*		*99*	*70-130*			

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Wyman Gordon West PCB ESS Laboratory Work Order: 1208043

Notes and Definitions

U	Analyte included in the analysis, but not detected
SD	Surrogate recovery(ies) diluted below the MRL (SD).
ICV	Initial Calibration Verification recovery is outside of control limit (ICV).
HT	The maximum holding time listed in 40 CFR Part 136 Table II for pH, Dissolved Oxygen, Sulfite and Residual Chlorine is fifteen minutes.
D+	Relative percent difference for duplicate is outside of criteria (D+).
D	Diluted.
C+	Continuing Calibration recovery is above upper control limit (C+).
A2	The Response Factor (RF) for this analyte did not meet the minimum RF criteria specified in Table 4 of Method 8260C, but was above 0.050. (0.064)
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Wyman Gordon West PCB

ESS Laboratory Work Order: 1208043

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Department of Defense (DoD) Environmental Laboratory Accreditation Program (ELAP)
A2LA Accredited: Testing Cert# 2864.01
http://www.a2la.org/scopepdf/2864-01.pdf

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/labs/waterlabs-instate.php

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water: RI0002
http://www.maine.gov/dep/blwq/topic/vessel/lab_list.pdf

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/labcert/labcert.aspx

New Hampshire (NELAP accredited) Potable and Non PotableWater, Solid and Hazardous Waste: 2424
http://www4.egov.nh.gov/des/nhelap/namesearch.asp

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

United States Department of Agriculture Soil Permit: S-54210

Maryland Potable Water: 301
http://www.mde.state.md.us/assets/document/WSP_labs-2009apr20.pdf

CHEMISTRY

A2LA Accredited: Testing Cert # 2864.01
Lead in Paint, Phthalates, Lead in Children's Metals Products (Including Jewelry)
http://www.A2LA.org/dirsearchnew/newsearch.cfm

CPSC ID# 1141
Lead Paint, Lead in Children's Metals Jewelry
http://www.cpsc.gov/cgi-bin/labapplist.aspx

Sample and Cooler Receipt Checklist

Client: GZA GeoEnvironmental, Inc.
Client Project ID: _____
Shipped/Delivered Via: ESS Courier

ESS Project ID: 12080043
Date Project Due: 8/9/12
Days For Project: 5 Day

Items to be checked upon receipt:

1. Air Bill Manifest Present?	* No	10. Are the samples properly preserved?	Yes
Air No.:		11. Proper sample containers used?	Yes
2. Were Custody Seals Present?	No	12. Any air bubbles in the VOA vials?	N/A
3. Were Custody Seals Intact?	N/A	13. Holding times exceeded?	No
4. Is Radiation count < 100 CPM?	Yes	14. Sufficient sample volumes?	Yes
5. Is a cooler present?	Yes	15. Any Subcontracting needed?	No
Cooler Temp: **2.6**		16. Are ESS labels on correct containers?	**Yes** / No
Iced With: **Icepacks**		17. Were samples received intact?	**Yes** / No
6. Was COC included with samples?	Yes	ESS Sample IDs:	
7. Was COC signed and dated by client?	Yes	Sub Lab:	
8. Does the COC match the sample	Yes	Analysis:	
9. Is COC complete and correct?	Yes	TAT:	

18. Was there need to call project manager to discuss status? If yes, please explain.

VOC 8260 sent to ESS North

Who was called?:_____ By whom? _____

Sample Number	Properly Preserved	Container Type	# of Containers	Preservative
1	Yes	1 L Glass	2	HCL
1	Yes	1 L Glass	1	NP
1	Yes	1 L Plastic	1	NP
1	Yes	250 ml Plastic	1	NaOH
1	Yes	500 ml Plastic	1	HNO3
1	Yes	500 ml Plastic	3	NP
1	Yes	Other Plastic	4	NP

Completed By: JK Date/Time: 8/2/12 1710
Reviewed By: CD Date/Time: 8/2/12 1720

ESS Laboratory

Division of Thielsch Engineering, Inc.

106 South Street, Hopkinton, MA 01748
Tel. (508) 435-9244 Fax (508) 435-9912
www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab # 1208043

Turn Time X Standard Other

Regulatory State: MA RI CT NH NJ NY ME Other

Is this project for any of the following:(please circle)
MA-MCP Navy USACE CT DEP Other

Reporting Limits -

Electonic Deliverables Excel Access PDF

Co. Name GZA	Project # 19274.08 TB3	Project Name Lyman-Goodn West PCB	
Contact Person Tim Boiqy	Proj. Location		
Address	City , State	Zip	PO #
Tel.	Fax.	email:	

ESS Lab ID	Date	Collection Time	Grab -G Composite-C	Matrix	Sample ID	Pres Code	# of Containers	Type of Container	Vol of Container	Analysis: VOC 8260 (1)	TSS SM2540D	TRC SM4500Cl	Chloride SM4500	Metals (1)	Hex Chromium	TDH 1664A	SVOC 8270	Cyanide	PCB 8082 (2)
01	8-2-12	12:45 PM	G	GW	WPCBW-1		15			X	X	X	X	X	X	X	X	X	X

Container Type: P-Poly G-Glass AG-Amber Glass S-Sterile V-VOA

Matrix: S-Soil SD-Solid D-Sludge WW-Wastewater GW-Groundwater SW-Surface Water DW-Drinking Water O-Oil W-Wipes F-Filter

Cooler Present Yes No

Seals Intact Yes No NA:

Cooler Temperature: 2.9 TB1209 8/6/12 1335 (TB)

Internal Use Only

[ ] Pickup 2.6°

[Y] Technician TB

Preservation Code: 1-NP, 2-HCl, 3-H2SO4, 4-HNO3, 5-NaOH, 6-MeOH, 7-Asorbic Acid, 8-ZnAct, 9-

Sampled by :

Comments: (1) VOC ESSNORM (1) With e-mail TSS (2) PCB might be High

Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)	Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)
8/2/12 13:30	8/2/12 1339	8/2/12 1435	8/2/12 14:45
8/2/12 16:25	8/2/12 1702		

* By circling MA-MCP, client acknowledges samples were collected in accordance with MADEP CAM VIIA

Please fax to the laboratory all changes to Chain of Custody

Report Method Blank & Laboratory Control Sample Results

1 (White) Lab Copy

2 (Yellow) Client Receipt

need to adjust bid - current list

ESS Laboratory

Division of Thielsch Engineering, Inc.

106 South Street, Hopkinton, MA 01748
Tel. (508) 435-9244 Fax (508) 435-9912
www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab # 208043

Turn Time _____ Standard Other _____

Regulatory State: MA RI CT NH NJ NY ME Other _____

Is this project for any of the following:(please circle)
MA-MCP Navy USACE CT DEP Other _____

Reporting Limits - _____

Electonic Deliverables Excel Access PDF

Co. Name GZA

Contact Person Tim Boigy

Project # 19274.08 T33 Project Name Lyman-Golden West PCB

Proj. Location North Grafton Ma

Address | City, State | Zip | PO #

Tel. | Fax. | email:

ESS Lab ID	Date	Collection Time	Grab -G Composite-C	Matrix	Sample ID	Pres Code	# of Containers	Type of Container	Vol of Container
01	8-2-12	12:45 PM	G	GW	WPCBW-1		15		
	* antimony ✓			* Hg ✓					
	* Arsenic ✓			* Ni ✓					
	* Cad ✓			* Selenium ✓					
	* total Cr ✓			* silver ✓					
	* Hex Cr ✓			* Zinc ✓					
	* Cu ✓			* IRON ✓					
	* Pb ✓								

Analysis: VOC 8260 | TSS SM2540D | TRC SM4500CL | Chloride SM4500 | Metals 6010 | Hex Chromium | TPH 1664A | SVOC 8270 | Cyanide | PCB 8082 (2)

VOC > 8260 IN Hopkinton

Container Type: P-Poly G-Glass AG-Amber Glass S-Sterile V-VOA

Matrix: S-Soil SD-Solid D-Sludge WW-Wastewater GW-Groundwater SW-Surface Water DW-Drinking Water O-Oil W-Wipes F-Filter

Cooler Present ✓ Yes ____ No

Seals Intact ____ Yes ____ No NA: ✓

Cooler Temperature: 2.9 TB 1209 8/6/12 1335 TB

Internal Use Only

[ ] Pickup

[✓] Technician TB

Preservation Code: 1-NP, 2-HCl, 3-H2SO4, 4-HNO3, 5-NaOH, 6-MeOH, 7-Asorbic Acid, 8-ZnAct, 9-_____

Sampled by :

Comments: ① Will e-mail 1791 ② PCB might be High

Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)	Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)
8/2 Thu 13:30	8/2/12 1359	8/2/12 1435	

* By circling MA-MCP client acknowledges samples were collected in accordance with MADEP CAM VIIA

Please fax to the laboratory all changes to Chain of Custody

Report Method Blank & Laboratory Control Sample Results

1 (White) Lab Copy
2 (Yellow) Client Receipt

ATTACHMENT 8

SUPPLEMENTAL INFORMATION – 7Q10 DATA FOR WATERSHED

File No. 19274.08
September 12, 2012

DILUTION FACTOR CALCULATIONS
NOTICE OF INTENT FOR THE REMEDIATION GENERAL PERMIT
244 Worcester Street, North Grafton, Massachusetts

$$DF = \frac{Q_d + Q_s}{Q_d}$$

Where,

DF = Dilution Factor

Q_d = Maximum Flow Rate of the Discharge in cubic feet per second (cfs) (1.0 gpm = 0.00223 cfs)

Q_s = Receiving Water 7Q10 Flow (cfs) where,

7Q10 = Minimum Flow (cfs) for 7 Consecutive Days with a Recurrence Interval of 10 Years.

Q_d = 100 gpm = 0.223 cfs

Q_s = 0.036 cfs (M7D10Y on attached USGS Streamstats Ungaged Site Report)

$$\therefore DF = \frac{Q_d + Q_s}{Q_d} = \frac{0.223 + 0.036}{0.223} = 1.16$$

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USGS Massachusetts StreamStats

Streamstats Ungaged Site Report

Date: Wed Sep 12 2012 07:25:01 Mountain Daylight Time
Site Location: Massachusetts
NAD27 Latitude: 42.2325 (42 13 57)
NAD27 Longitude: -71.7308 (-71 43 51)
NAD83 Latitude: 42.2326 (42 13 58)
NAD83 Longitude: -71.7304 (-71 43 49)
ReachCode: 01090003005521
Measure: 78.78
Drainage Area: 0.65 mi2

Low Flows Basin Characteristics

100% Statewide Low Flow (0.65 mi2)

Parameter	Value	Regression Equation Valid Range	
		Min	Max
Drainage Area (square miles)	0.65 (below min value 1.61)	1.61	149
Mean Basin Slope from 250K DEM (percent)	2.23	0.32	24.6
Stratified Drift per Stream Length (square mile per mile)	0.45	0	1.29
Massachusetts Region (dimensionless)	0	0	1

Warning: Some parameters are outside the suggested range. Estimates will be extrapolations with unknown errors.

Probability of Perennial Flow Basin Characteristics

100% Perennial Flow Probability (0.65 mi2)

Parameter	Value	Regression Equation Valid Range	
		Min	Max
Drainage Area (square miles)	0.65	0.01	1.99
Percent Underlain By Sand And Gravel (percent)	73.61	0	100
Percent Forest (percent)	32.15	0	100
Massachusetts Region (dimensionless)	0	0	1

Low Flows Streamflow Statistics

Statistic	Flow (ft^3/s)	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
				Minimum	Maximum
D50	0.62				
D60	0.45				
D70	0.31				
D75	0.25				
D80	0.25				
D85	0.18				
D90	0.16				
D95	0.0838				
D98	0.0536				
D99	0.0374				
M7D2Y	0.0792				
	0.19				

AUGD50					
M7D10Y	0.036				

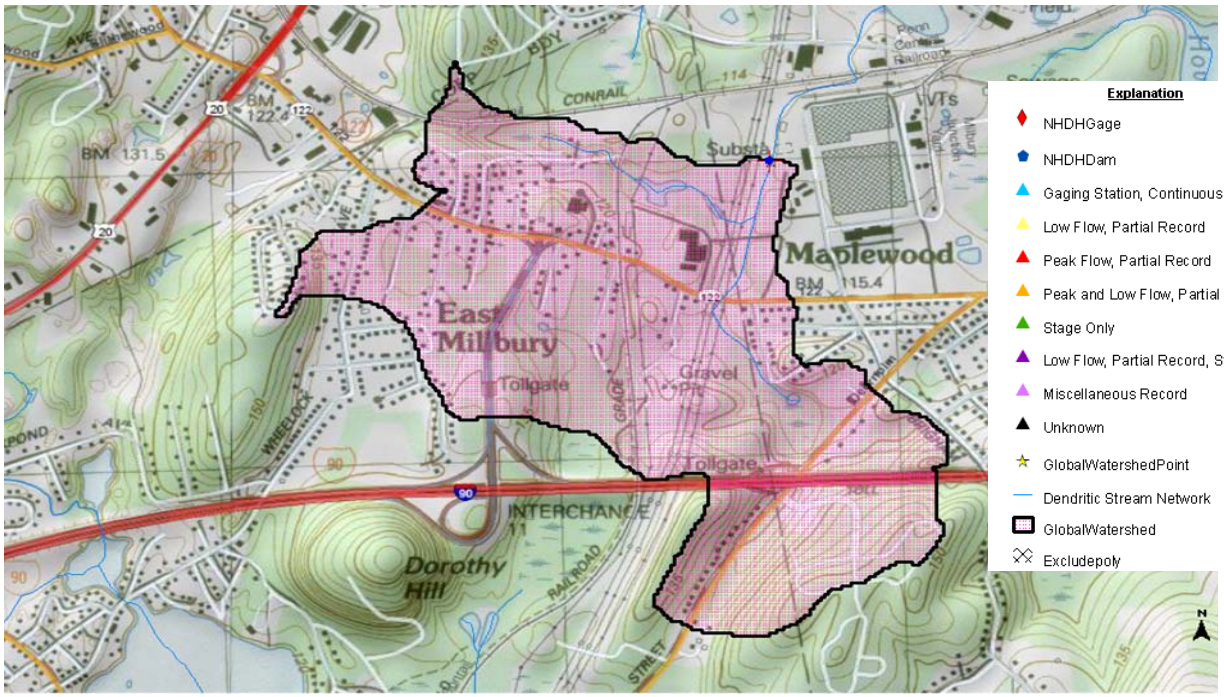
The equation for estimating the probability of perennial flow is applicable for most areas of Massachusetts except eastern Buzzards Bay, Cape Cod, and the Island regions. The estimate obtained from the equation assumes natural flow conditions at the site. The equation also is best used for sites with drainage areas between 0.01 to 1.99 mi2, as errors beyond for basins beyond these bounds are unknown.

Probability of Perennial Flow Statistics

Statistic	Value	Standard Error (percent)
PROBPEREN	0.92	0.4

USGS Massachusetts StreamStats

StreamStats Print Page



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