

DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 2/5/99

RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA750)
Migration of Contaminated Groundwater Under Control

Facility Name: Thomas G. Faria Corporation
Facility Address: Pink Row, Uncasville, CT
Facility EPA ID #: CTD043038744

RCRA RECORDS CENTER
FACILITY FARIA, THOMAS G.
I.D. NO. CTD 043038744
FILE LOC. R-13
OTHER # 104493

- 1. Has all available relevant/significant information on known and reasonably suspected releases to the groundwater media, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been considered in this EI determination?

[x] If yes - check here and continue with #2 below.

[] If no - re-evaluate existing data, or

[] if data are not available, skip to #8 and enter "IN" (more information needed) status code.



RDMS DocID 104493

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Migration of Contaminated Groundwater Under Control" EI

A positive "Migration of Contaminated Groundwater Under Control" EI determination ("YE" status code) indicates that the migration of "contaminated" groundwater has stabilized, and that monitoring will be conducted to confirm that contaminated groundwater remains within the original "area of contaminated groundwater" (for all groundwater "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Migration of Contaminated Groundwater Under Control" EI pertains ONLY to the physical migration (i.e., further spread) of contaminated ground water and contaminants within groundwater (e.g., non-aqueous phase liquids or NAPLs). Achieving this EI does not substitute for achieving other stabilization or final remedy requirements and expectations associated with sources of contamination and the need to restore, wherever practicable, contaminated groundwater to be suitable for its designated current and future uses.

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

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2. Is **groundwater** known or reasonably suspected to be "**contaminated**"¹ above appropriately protective "levels" (i.e., applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action, anywhere at, or from, the facility?

If yes - continue after identifying key contaminants, citing appropriate "levels," and referencing supporting documentation.

If no - skip to #8 and enter "YE" status code, after citing appropriate "levels," and referencing supporting documentation to demonstrate that groundwater is not "contaminated."

If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s): Chlorinated solvents are present in groundwater on the facility property at elevated concentrations. Faria operates a groundwater recovery and treatment system designed to control the groundwater plume. To monitor the system, groundwater elevations are measured and groundwater samples are collected and analyzed quarterly for VOCs at twelve monitoring wells on-site and three shallow dug wells (formerly for private, residential uses) and two drilled deep overburden wells off-site. The most recent analytical results reported to EPA, for September 2004, December 2004, and March 2005, show on-site concentrations of tetrachloroethene up to 7200 µg/L; trichloroethene up to 250 µg/L; 1,1-dichloroethene up to 12 µg/L; benzene up to 5.8 µg/L; and vinyl chloride up to 2.3 µg/L. March and April 2005 analytical results show off-site concentrations of tetrachloroethene up to 78.8 µg/L and trichloroethene up to 5.3 µg/L; (March 2005 System Monitoring Report Interim Measure Groundwater Recovery and Treatment System, prepared by Woodard & Curran, Inc. for Thomas G. Faria Corporation). Connecticut Remediation Standard Regulation (CT RSR) GA/GAA groundwater protection criteria (GWPC) for these constituents are as follows: 5 µg/L for tetrachloroethene and trichloroethene, 7 µg/L for 1,1-dichloroethene, 2 µg/L for vinyl chloride and 1 µg/L for benzene.

Footnotes:

¹"Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriate "levels" (appropriate for the protection of the groundwater resource and its beneficial uses).

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3. Has the migration of contaminated groundwater stabilized (such that contaminated groundwater is expected to remain within "existing area of contaminated groundwater"² as defined by the monitoring locations designated at the time of this determination)?

If yes - continue, after presenting or referencing the physical evidence (e.g., groundwater sampling/measurement/migration barrier data) and rationale why contaminated groundwater is expected to remain within the (horizontal or vertical) dimensions of the "existing area of groundwater contamination"²).

If no (contaminated groundwater is observed or expected to migrate beyond the designated locations defining the "existing area of groundwater contamination"²) - skip to #8 and enter "NO" status code, after providing an explanation.

If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s): Approximately 2,000 feet downgradient from the Faria property, groundwater is reasonably expected to discharge to the Thames River. Therefore, while the nature and extent of groundwater contamination has not yet been fully characterized, contamination in groundwater is not reasonably expected to extend beyond the west bank of the Thames River. VOC contamination has been documented in soils on the Faria property and has yet to be fully characterized. These contaminated soils may act as an ongoing source of contaminants in groundwater. However, previous remedial efforts by Faria have removed a substantial portion of the groundwater contaminant sources. In addition, Faria operates a groundwater recovery and treatment system. Evaluations of the adequacy of groundwater capture are ongoing for the recovery system and current data suggest the need for system upgrades. However, operation of this system appears to reduce the migration of contaminated groundwater beyond the facility boundary. Therefore, based on Faria's previous efforts to remove groundwater contaminant sources and its current operation of the groundwater recovery and treatment system, contaminant inputs to groundwater migrating past the Faria property boundary are limited.

² "existing area of contaminated groundwater" is an area (with horizontal and vertical dimensions) that has been verifiably demonstrated to contain all relevant groundwater contamination for this determination, and is defined by designated (monitoring) locations proximate to the outer perimeter of "contamination" that can and will be sampled/tested in the future to physically verify that all "contaminated" groundwater remains within this area, and that the further migration of "contaminated" groundwater is not occurring. Reasonable allowances in the proximity of the monitoring locations are permissible to incorporate formal remedy decisions (i.e., including public participation) allowing a limited area for natural attenuation.

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4. Does "contaminated" groundwater discharge into surface water bodies?

If yes - continue after identifying potentially affected surface water bodies.

If no - skip to #7 (and enter a "YE" status code in #8, if #7 = yes) after providing an explanation and/or referencing documentation supporting that groundwater "contamination" does not enter surface water bodies.

If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s): Evaluations of groundwater interaction with surface water bodies on and downgradient of the Faria property are ongoing. Based on current data, contaminated groundwater may be reasonably expected to discharge to the Oxoboxo Brook, Gairs Pond, the Thames River, and an un-named brooklet that discharges to Gairs Pond.

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5. Is the **discharge** of "contaminated" groundwater into surface water likely to be **"insignificant"** (i.e., the maximum concentration³ of each contaminant discharging into surface water is less than 10 times their appropriate groundwater "level," and there are no other conditions (e.g., the nature, and number, of discharging contaminants, or environmental setting), which significantly increase the potential for unacceptable impacts to surface water, sediments, or eco-systems at these concentrations)?

 x If yes - skip to #7 (and enter "YE" status code in #8 if #7 = yes), after documenting: 1) the maximum known or reasonably suspected concentration³ of key contaminants discharged above their groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) provide a statement of professional judgement/explanation (or reference documentation) supporting that the discharge of groundwater contaminants into the surface water is not anticipated to have unacceptable impacts to the receiving surface water, sediments, or eco-system.

_____ If no - (the discharge of "contaminated" groundwater into surface water is potentially significant) - continue after documenting: 1) the maximum known or reasonably suspected concentration³ of each contaminant discharged above its groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) for any contaminants discharging into surface water in concentrations³ greater than 100 times their appropriate groundwater "levels," the estimated total amount (mass in kg/yr) of each of these contaminants that are being discharged (loaded) into the surface water body (at the time of the determination), and identify if there is evidence that the amount of discharging contaminants is increasing.

_____ If unknown - enter "IN" status code in #8.

Rationale and Reference(s): Contaminant concentrations have been below the CT RSR Surface Water Protection Criteria in recent samples collected from the groundwater wells that are closest to the Oxoboxo Brook, Gairs Pond, the Thames River, and the un-named brooklet that discharges to Gairs Pond and that are screened in the aquifers from which groundwater would be expected to discharge to these surface water bodies. Concentrations in these wells do not appear to be increasing. For these reasons, the discharge of groundwater contaminants into surface water is not anticipated to have unacceptable impacts to the receiving surface water body.

³ As measured in groundwater prior to entry to the groundwater-surface water/sediment interaction (e.g., hyporheic) zone.

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6. Can the discharge of "contaminated" groundwater into surface water be shown to be "currently acceptable" (i.e., not cause impacts to surface water, sediments or eco-systems that should not be allowed to continue until a final remedy decision can be made and implemented⁴)?

_____ If yes - continue after either: 1) identifying the Final Remedy decision incorporating these conditions, or other site-specific criteria (developed for the protection of the site's surface water, sediments, and eco-systems), and referencing supporting documentation demonstrating that these criteria are not exceeded by the discharging groundwater; OR 2) providing or referencing an interim-assessment,⁵ appropriate to the potential for impact, that shows the discharge of groundwater contaminants into the surface water is (in the opinion of a trained specialists, including ecologist) adequately protective of receiving surface water, sediments, and eco-systems, until such time when a full assessment and final remedy decision can be made. Factors which should be considered in the interim-assessment (where appropriate to help identify the impact associated with discharging groundwater) include: surface water body size, flow, use/classification/habitats and contaminant loading limits, other sources of surface water/sediment contamination, surface water and sediment sample results and comparisons to available and appropriate surface water and sediment "levels," as well as any other factors, such as effects on ecological receptors (e.g., via bio-assays/benthic surveys or site-specific ecological Risk Assessments), that the overseeing regulatory agency would deem appropriate for making the EI determination.

_____ If no - (the discharge of "contaminated" groundwater can not be shown to be "currently acceptable") - skip to #8 and enter "NO" status code, after documenting the currently unacceptable impacts to the surface water body, sediments, and/or eco-systems.

_____ If unknown - skip to 8 and enter "IN" status code.

Rationale and Reference(s): _____

⁴ Note, because areas of inflowing groundwater can be critical habitats (e.g., nurseries or thermal refugia) for many species, appropriate specialist (e.g., ecologist) should be included in management decisions that could eliminate these areas by significantly altering or reversing groundwater flow pathways near surface water bodies.

⁵ The understanding of the impacts of contaminated groundwater discharges into surface water bodies is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration to be reasonably certain that discharges are not causing currently unacceptable impacts to the surface waters, sediments or eco-systems.

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7. Will groundwater **monitoring** / measurement data (and surface water/sediment/ecological data, as necessary) be collected in the future to verify that contaminated groundwater has remained within the horizontal (or vertical, as necessary) dimensions of the "existing area of contaminated groundwater?"

If yes - continue after providing or citing documentation for planned activities or future sampling/measurement events. Specifically identify the well/measurement locations which will be tested in the future to verify the expectation (identified in #3) that groundwater contamination will not be migrating horizontally (or vertically, as necessary) beyond the "existing area of groundwater contamination."

If no - enter "NO" status code in #8.

If unknown - enter "IN" status code in #8.

Rationale and Reference(s): Quarterly groundwater sampling will continue at the following on-site wells: RW-120, MW-2, MW-3S, MW-3D, MW-3R, MW-4S, MW-4D, MW-4R, MW-5, MW-102, MW-103, MW-104. Quarterly groundwater sampling is also expected to continue at the following off-site wells, but is subject to continued permission from property owners: MW-200, MW-201, 23 Pink Row, 27 Pink Row, and 31 Pink Row.

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8. Check the appropriate RCRIS status codes for the Migration of Contaminated Groundwater Under Control EI (event code CA750), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (attach appropriate supporting documentation as well as a map of the facility).

YE - Yes, "Migration of Contaminated Groundwater Under Control" has been verified. Based on a review of the information contained in this EI determination, it has been determined that the "Migration of Contaminated Groundwater" is "Under Control" at the Thomas G. Faria Corporation facility, EPA ID # CTD043038744, located at Pink Row, Uncasville, CT. Specifically, this determination indicates that the migration of "contaminated" groundwater is under control, and that monitoring will be conducted to confirm that contaminated groundwater remains within the "existing area of contaminated groundwater" This determination will be re-evaluated when the Agency becomes aware of significant changes at the facility.

NO - Unacceptable migration of contaminated groundwater is observed or expected.

IN - More information is needed to make a determination.

Completed by (signature) *Stephanie Carr* Date 9/13/05
(print) Stephanie Carr
(title) RCRA Facility Manager

Supervisor (signature) *Raphael Carr* Date 6-12-06
(print) RAPHAEL CARR
(title) SECTION CHIEF
(EPA Region or State) EPA REGION 1

Locations where references may be found:

March 2005 System Monitoring Report Interim Measure Groundwater Recovery and Treatment System, dated June 6, 2005, prepared by Woodard & Curran, Inc. for Thomas G. Faria Corporation (available at EPA- New England, 1 Congress Street, Boston, MA)

Response to EPA Comments on the Supplemental RFI Report, dated February 28, 2005, prepared by ENSR for Thomas G. Faria Corporation (available at EPA- New England, 1 Congress Street, Boston, MA)

Connecticut Remediation Standard Regulations (available at <http://dep.state.ct.us/wtr/regs/remediationregs.htm>)

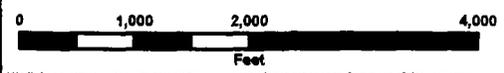
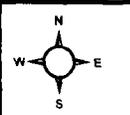
Contact telephone and e-mail numbers: (name) Stephanie Carr
(phone #) 617/918-1363
(e-mail) carr.stephanie@epa.gov



Legend

GroundWaterQuality Class

-  <all other values>
- WQCLASSP**
-  GA
-  GA-Impaired
-  GAA
-  GAA-Impaired
-  GAA-NY
-  GAA-Well
-  GAA-Well-Impaired
-  GAAs
-  GB
-  GC

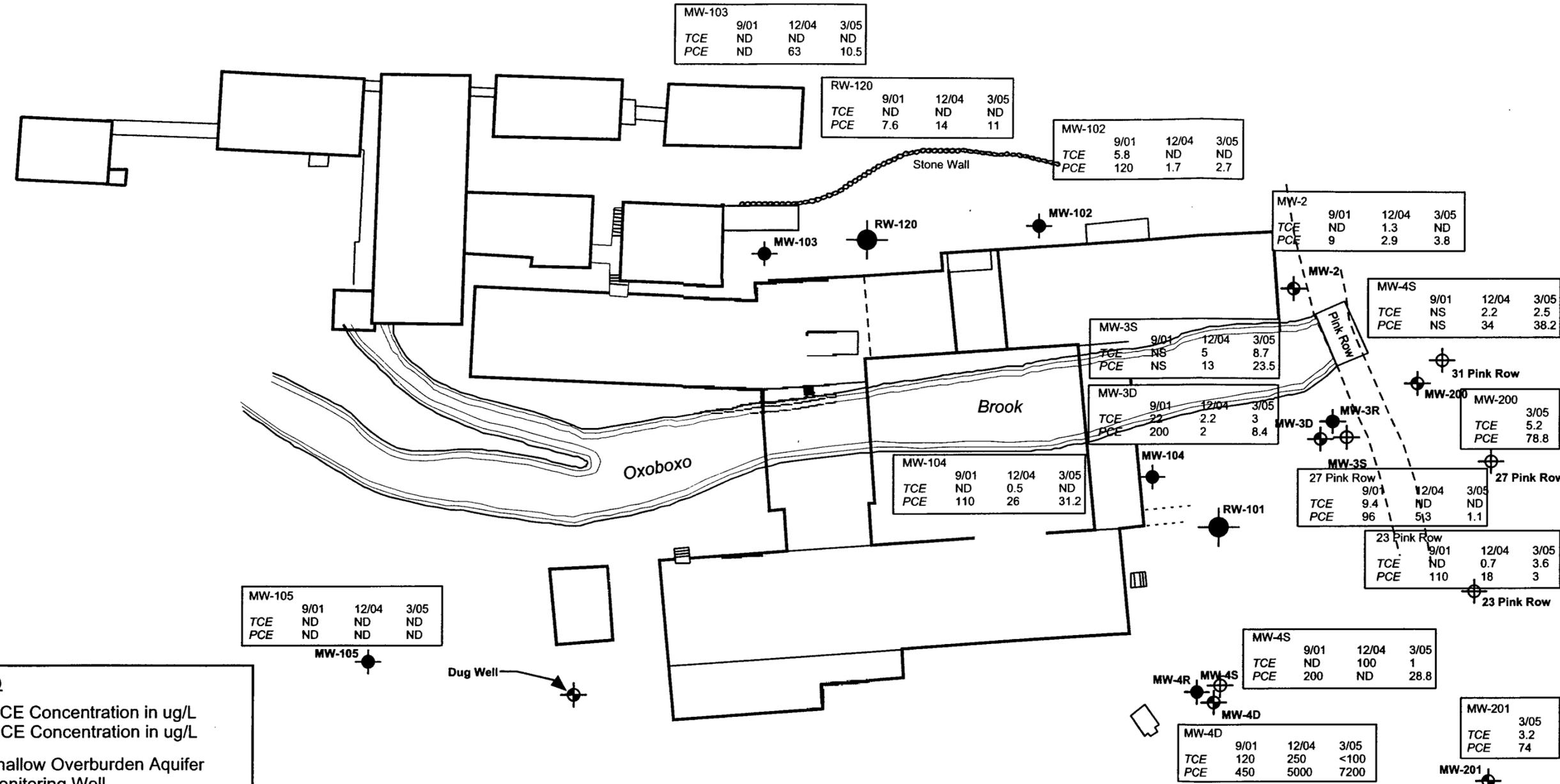


Thomas G. Faria
 Corporation
 Uncasville, Connecticut

FIGURE 11:
 CT DEP Water Quality Map

Source: CT DEP
 Updated 11/2004

J:\ndf_Service\Project Files\Faria\10125\Supplemental RFI\Responses to Comments\GWQuality.mxd
 01/28/2005



MW-103			
	9/01	12/04	3/05
TCE	ND	ND	ND
PCE	ND	63	10.5

RW-120			
	9/01	12/04	3/05
TCE	ND	ND	ND
PCE	7.6	14	11

MW-102			
	9/01	12/04	3/05
TCE	5.8	ND	ND
PCE	120	1.7	2.7

MW-2			
	9/01	12/04	3/05
TCE	ND	1.3	ND
PCE	9	2.9	3.8

MW-4S			
	9/01	12/04	3/05
TCE	NS	2.2	2.5
PCE	NS	34	38.2

MW-3S			
	9/01	12/04	3/05
TCE	NS	5	8.7
PCE	NS	13	23.5

MW-3D			
	9/01	12/04	3/05
TCE	22	2.2	3
PCE	200	2	8.4

MW-200			
	9/01	12/04	3/05
TCE	5.2		
PCE	78.8		

MW-104			
	9/01	12/04	3/05
TCE	ND	0.5	ND
PCE	110	26	31.2

27 Pink Row			
	9/01	12/04	3/05
TCE	9.4	ND	ND
PCE	96	5/3	1.1

23 Pink Row			
	9/01	12/04	3/05
TCE	ND	0.7	3.6
PCE	110	18	3

MW-105			
	9/01	12/04	3/05
TCE	ND	ND	ND
PCE	ND	ND	ND

MW-4S			
	9/01	12/04	3/05
TCE	ND	100	1
PCE	200	ND	28.8

MW-4D			
	9/01	12/04	3/05
TCE	120	250	<100
PCE	450	5000	7200

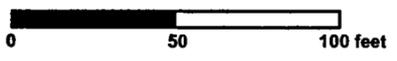
MW-201			
	9/01	12/04	3/05
TCE	3.2		
PCE	74		

MW-5			
	9/01	12/04	3/05
TCE	ND	ND	1
PCE	28	4.3	15.1

LEGEND

- ND TCE Concentration in ug/L
- ND PCE Concentration in ug/L
- Shallow Overburden Aquifer Monitoring Well
- Deep Overburden Aquifer Monitoring Well
- Bedrock Aquifer Monitoring Well
- Recovery Well

NOTE: Groundwater elevation relative to mean sea level
 ND - Not detected at method detection limit of 0.5 ug/L.



DES.BY:	DR.BY: CJP	CK.BY: RM
THOMAS G. FARIA CORPORATION		
FIGURE 4		
TCE and PCE CONCENTRATION IN GROUNDWATER		
March 29, 2005		
SCALE: 1" = 50'	JOB NO.: 985031.21	
DATE: June 2005	FILE NAME: PCE/TCE	
WOODARD & CURRAN Engineering • Science • Operations		