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: **Lonza, Inc. – Riverside Plant**
Facility Address: **900 River Road, Conshohocken, PA 19428**
Facility EPA ID #: **PAD980550412**

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 #6 and enter "IN" (more information needed) status code.

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).

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?

__X__ 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):

The Lonza, Inc. - Riverside Plant (facility or Lonza) was owned and operated from 1992 until 2010 by Lonza Inc., and is located approximately 15 miles northwest of Philadelphia, within a heavy industrial zoning district in Conshohocken, Montgomery County, Pennsylvania. On November 1, 2010, Johnson Matthey purchased the facility from Lonza Inc.

Located between the Schuylkill River (to the east) and River Road (to the west), the facility consists of two industrial complexes that occupy 29.2 acres. A rail line runs through the facility property, though the facility never used the rail line for any transportation purposes.

The facility historically and currently operates under EPA ID No. PAD980550412 for its hazardous waste operations. It is a large quantity generator (LQG) of hazardous waste, operates a hazardous waste incinerator under a treatment/storage/disposal (TSD) permit and operates a hazardous wastewater treatment (WWT) plant under Pennsylvania Department of Environmental Protection (PADEP) permit by rule (PBR) regulations. Waste treatment operations include evaporation, stripping, liquid and gaseous (volatile organic carbon) waste incineration, bio-oxidation, clarification, and sand filtration.

A RCRA Facility Assessment (RFA) Phase II and a Remedial Investigation (RI) study were performed during the 1980s. Several solid waste management units (SWMUs) and releases were identified at the facility. Several spills, releases, and cleanup activities were reported to PADEP between 2003 and 2009. On January 21, 2011, Lonza submitted to PADEP the Act 2 Combined RI Report/Risk Assessment Report (Combined RIR/RAR). On May 4, 2011, PADEP provided Lonza a deficiency letter. On July 5, 2011, Lonza submitted an addendum to the Combined RIR/RAR. On July 28, 2011, PADEP approved the RIR in accordance with the provisions of Act 2.

On July 31, 2012, PADEP notified Johnson Matthey that it had received and reviewed the June 7, 2012, Final Report for Soil and Groundwater. The final report described the area(s) of the property characterized, contaminants identified, remediation performed, and that a site-specific standard was attained. PADEP approved this report for the substances identified in soil and groundwater and remediated to an Act 2 standard within the site. The facility attained the nonresidential (NR) site-specific standard for arsenic and lead in soil through pathway elimination. Bis(2-ethylhexyl)phthalate was detected in one well (7.3 µg/L at MW-5, located in the center of the site) slightly above the PADEP Medium Specific Concentrations (MSC) and EPA Drinking water standards of 6 µg/L The site-specific standard was attained for bis(2-ethylhexyl)phthalate, methylene chloride, MTBE, arsenic, beryllium, and lead in groundwater via pathway elimination.

[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).

Since the site-specific standard was selected for soil and groundwater via pathway elimination, PADEP and EPA require an environmental covenant on the site that includes the following activity and use limitations:

- Restriction of groundwater usage.
- Restriction of the use of the property to nonresidential purposes only.
- The current asphalt, concrete, and gravel cap present across the site will be inspected and maintained per the Post Remediation Care Plan (PRCP) to eliminate exposure to surface soils in localized areas where impacts above direct contact MSCs are documented.

A PRCP is not required for downgradient properties since the dissolved phase plume attains the statewide health standard on the site, based on groundwater sampling results from the perimeter well sampling data.

Groundwater is present at a depth of 50 to 80 feet bgs within bedrock fractures, bedding planes, and solution channels. Closer to the river, monitoring wells screened within the overburden encountered shallower groundwater depths (less than approximately 30 feet bgs) within the facility area. Groundwater beneath the facility was encountered in the overburden with depths ranging from 11 to 28 feet bgs. Based on the proximity of the facility to the Schuylkill River, the net flow is expected to be from west to east across the site; however, different hydrogeologic conditions can alter the groundwater flow. Groundwater elevation contour maps were prepared for the October and November 2010 sampling events; groundwater flow was generally to the west toward River Road at an average gradient of approximately 0.02.

Groundwater usage in the vicinity of the facility is primarily for industrial purposes such as cooling and lawn irrigation. There are no known production wells at the facility. There are no known drinking water wells within one mile of the facility. Potable water for the area is obtained from the local water utility, which receives water from various sources such as wells, surface water, and reservoirs.

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)?

__X__ 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):

Groundwater at the facility was sampled on 7/16/2010 and again on 10/15/2010 for MTBE (Methyl tert-butyl ether, Methylene Chloride, Bis(2-ethylhexyl) phthalate (BEHP), Arsenic, Beryllium, Lead, and Zinc. None of the constituents detected were above the PADEP used aquifer MSCs at the point of compliance wells (MW-1, MW-2, MW-3, MW-4, and MW-6), as illustrated in the attached Figure 8. Both the PADEP Used Aquifer MSC and the EPA Drinking water standards for BEHP have a limit 6 µg/L. PADEP's non-use aquifer MSC for BEHP is 290 µg/L. Although BEHP was detected at MW-5 (7.3 µg/L), located in the interior portion of the site, at a concentration slightly above the drinking water standard, this compound was not observed at detectable levels at any of the five point of compliance wells. As a result of the sampling, the site-specific standard has been attained for these constituents through pathway elimination.

The facility utilizes the municipal water supply, which obtains water supplied from various sources such as wells, surface water, and reservoirs. Groundwater usage in the vicinity of the facility is primarily for industrial purposes such as cooling and lawn irrigation. There are no known production wells at the facility. There are no known drinking water wells within a one mile of the facility.

Since the facility demonstrated attainment of the site-specific standard via pathway elimination for the site, an environmental covenant has been recorded for the Lonza property.

[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.

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

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

__X__ 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):

None of the chemical constituents detected in groundwater at the downgradient point of compliance wells (MW-1, MW-3, and MW-4) were above the PADEP used aquifer MSCs or EPA maximum contaminant levels (MCLs). These point of compliance wells lie between groundwater direction flow and the Schuylkill River. If contamination were being discharged from this facility into the Schuylkill River, it would be detected in these wells. Reference attached Figure 8 for visual location of these compliance wells. The Schuylkill River is located east of the railroad tracks shown in Figure 8.

5. Is the **discharge** of "contaminated" groundwater into surface water likely to be **"insignificant"** (i.e., the maximum concentration[3] 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)?

____ If yes - skip to #7 (and enter "YE" status code in #8 if #7 = yes), after documenting: 1) the maximum known or reasonably suspected concentration[3] 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 concentration[3] 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 concentrations[3] 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):

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

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 implemented[4])?

____ 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, 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.

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?"

__x__ 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):

After multiple rounds of sampling from the facility's wells, no exceedances of PADEP used aquifer MSCs from any groundwater sample were detected. No further sampling and no further action is requested with respect to groundwater as no Contaminants of Potential Concern (COPC's) were detected at concentrations above PADEP used aquifer MSCs for any perimeter monitoring wells. No further action or investigations are planned for soil or groundwater.

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).

__X__ 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 **Lonza, Inc. – Riverside Plant** facility, EPA ID # **PAD980550412**, located at **900 River Road, Conshohocken, PA 19428**. 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) _____ for Date 6/12/15

(print) Grant Dufficy

(title) RCRA Project Manager

Supervisor (signature) _____ Date 6/12/15

(print) Luis Pizarro

(title) Assoc. Director Office of Remediation

(EPA Region or State) EPA Region III

Locations where References may be found:

USEPA Region III
Land & Chemicals Division
1650 Arch Street
Philadelphia, PA 19103

PADEP
South East Regional Office
2 E. Main Street
Norristown, PA 19401

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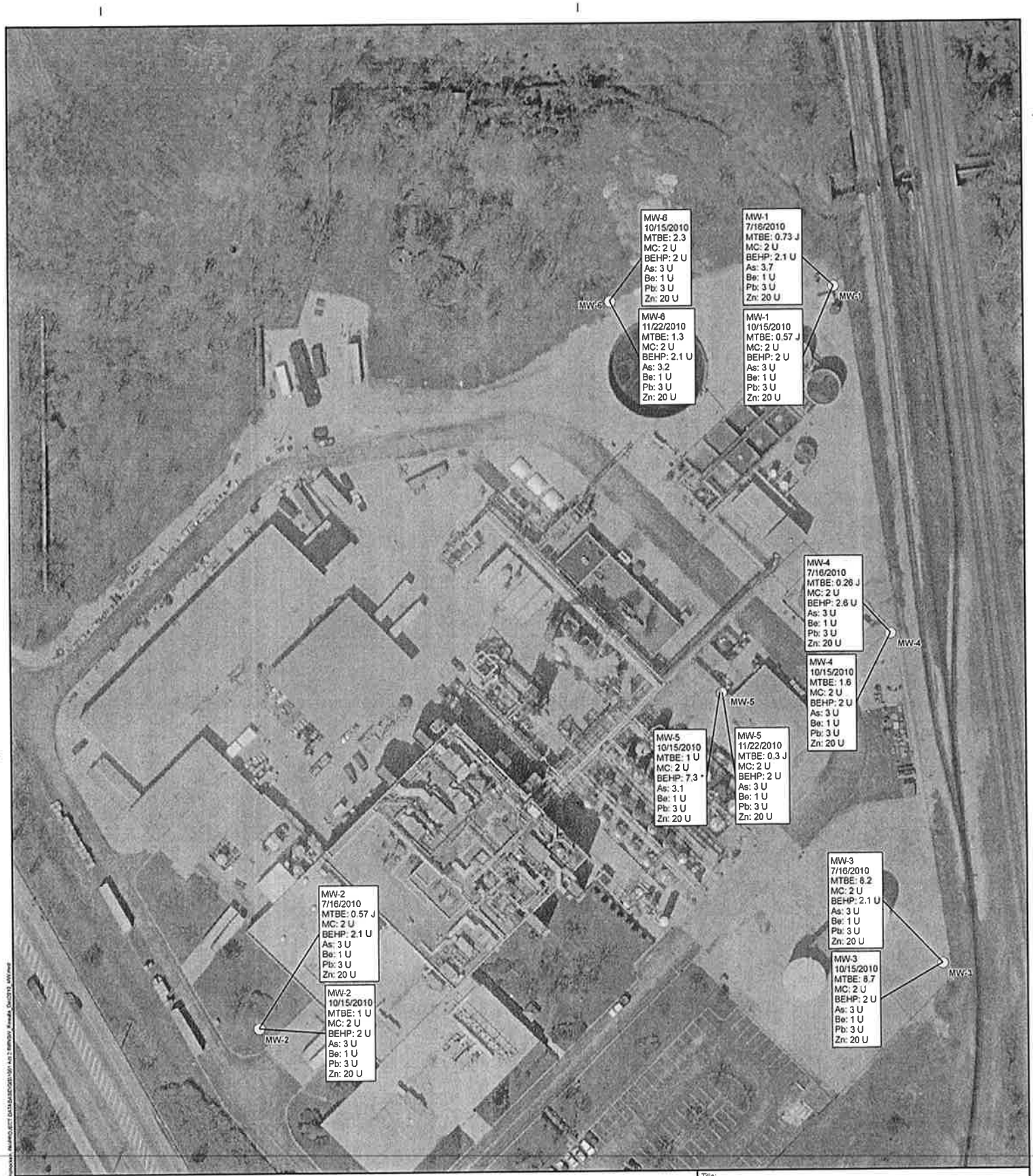

Legend

- Monitoring Well with one or more exceedances of the PADEP NRUA MSC
- Monitoring Well with no exceedances of the PADEP NRUA MSC

* Result exceeds PADEP NRUA MSC. No results exceed PADEP NRUNA MSC.

Notes:

1. PADEP NRUA MSC = Pennsylvania Department of Environmental Protection Nonresidential Used Aquifer Medium Specific Concentration.
   PADEP NRNUA MSC = Pennsylvania Department of Environmental Protection Nonresidential Non-used Aquifer Medium Specific Concentration.
2. All results reported in micrograms per liter (ug/l).
3. J = Result below the reporting limit (estimated value).
   U = Not detected above laboratory detection limit.
4. MTBE: Methyl tert butyl ether, MC: Methylene Chloride, BEHP: bis(2-Ethylhexyl)phthalate, As: Arsenic, Be: Beryllium, Pb: Lead, and Zn: Zinc.
5. 2005 Aerial photography provided by the Delaware Valley Regional Planning Commission, published June 29, 2007.

N

60 0 60 120 Feet

Title:

MONITORING WELL GROUNDWATER SAMPLE RESULTS

900 River Road
Conshohocken, Pennsylvania

Prepared For:

Lonza Inc.

ROUX ASSOCIATES, INC. Environmental Consulting & Management	Compiled by: ST	Date: 12/20/2010	FIGURE 8
	Prepared by: ST	Scale: 1:720	
	Project Mgr: EP	Office: NJ	
	File No: 1001.F8(CP)	Project: 1912.0001J003	