

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 5

RECORD OF DECISION

**Ottawa Township Flat Glass Superfund Site**  
Naplate, La Salle County, Illinois



Selected Remedial Alternatives for the Residential Soils Operable Unit  
and the Illinois River Sediment Operable Unit

September 2008

Cover photo credit: Pilkington North America, Inc. (Hull and Associates, Inc.)

This aerial photo shows nearly the entire Ottawa Township Flat Glass site, formerly known as the Libbey-Owens-Ford (LOF) Plants 5 & 7 site, in Naplate, Illinois. North is at the top of the frame. The flat glass manufacturing facility, now owned by Pilkington North America, Inc. (PNA), is located in the center of the image (PNA-owned property is outlined in red). The Village of Naplate is located immediately north of the plant. U.S. Silica sand quarries can be seen to the west and north of the facility and the Illinois River is south of the plant. A site feature known as the "Original Sand Pond" (OSP) is shown outlined in yellow on the PNA property. The OSP is an area where manufacturing process wastes containing arsenic were stored and/or disposed of by LOF and other past site operators prior to 1980.

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## **DECLARATION**

Selected Remedial Alternatives for the Residential Soils and the  
Illinois River Sediment Operable Units of the

**Ottawa Township Flat Glass Site**  
Naplate, La Salle County, Illinois

### **Statement of Basis and Purpose**

This decision document presents the selected remedial actions for the Residential Soils operable unit (OU #1) and the Illinois River Sediment operable unit (OU #2) of the Ottawa Township Flat Glass (OTFG) site in Naplate, La Salle County, Illinois (CERCLIS identification number ILD005468616). The site is also known as the "Libbey-Owens-Ford (LOF) Plants 5&7" site.

The United States Environmental Protection Agency (U.S. EPA), in consultation with the Illinois Environmental Protection Agency (IL EPA), chose the remedies in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). Our decisions are based on the Administrative Record for the OTFG site.

### **Description of the Selected Remedies**

U.S. EPA, in consultation with IL EPA, has determined that for the Residential Soils operable unit, no further remedial action is necessary to protect public health or welfare or the environment. We have also determined that for the Illinois River Sediment operable unit, no remedial action is necessary to protect public health or welfare or the environment.

The selected remedial action for the Residential Soils operable unit allows for unlimited use of the entire Naplate residential area including the two residential lots that were cleaned up under a prior removal action. The selected remedial action also allows for unrestricted exposure to residual and/or naturally-occurring arsenic levels in the entire Naplate residential area except at the single residential lot whereupon a residual amount of potentially contaminated soil appears to lie beneath a corner of the house foundation. However, the potentially responsible party (PRP) has already applied an institutional control (IC) to the property deed to help maintain protectiveness.

The selected remedial action for the Illinois River Sediment operable unit allows for unlimited use of the Illinois River sediment and unrestricted exposure to naturally-occurring and/or site-derived arsenic levels in the sediment, except for a designated small stretch of river adjacent to the glass-making facility. At this designated stretch of river, the projected maximum site uses involve trespassing or recreational exposures

and, therefore, no adverse human health risks are calculated to occur. Here, U.S. EPA recommends that the site owner erect "No Trespassing" signs along the riverbank to help prevent trespass exposures. U.S. EPA, in consultation with IL EPA, will periodically monitor the future site use assumptions for this small area to maintain protectiveness.

Note: This Record of Decision (ROD) does not address the groundwater and source area operable units (OU #3 and OU #4) of the OTFG site. U.S. EPA will address these operable units in a subsequent ROD for the OTFG site.

### **Statutory Determinations**

U.S. EPA, in consultation with IL EPA, has determined that at the Residential Soils operable unit, no further remedial action is necessary to protect public health or welfare or the environment. The PRP has undertaken previous response actions at the site and subsequent soil sampling results and the baseline human health risk assessment calculations demonstrate that these response actions have eliminated the need to conduct further remedial action at this operable unit.

U.S. EPA, in consultation with IL EPA, has also determined that at the Illinois River Sediment operable unit, no remedial action is necessary to protect public health or welfare or the environment. The baseline ecological and human health risk assessment calculations demonstrate that no current or potential future site conditions or uses pose unacceptable risks to human health or the environment at this operable unit.

U.S. EPA will perform statutory Five-Year Reviews at the designated residential lot and the Illinois River segment next to the facility where arsenic is found above background levels because the selected remedial actions will result in a hazardous substance, pollutant, or contaminant (arsenic) to remain on small parts of the site in excess of levels allowing for unlimited use and unrestricted exposure. We will continue to perform statutory Five-Year Reviews of the selected remedial actions at the OTFG site until conditions allow for full unlimited use and unrestricted exposure at these operable units.

### **State Concurrence**

The State of Illinois has indicated its intention to concur with the selected remedy. The Letter of Concurrence will be attached to this Record of Decision upon receipt.

Approved by: Richard C. Karl 9-25-08  
Richard C. Karl, Director Date  
Superfund Division

U.S. ENVIRONMENTAL PROTECTION AGENCY

ADMINISTRATIVE RECORD  
FOR  
OTTAWA TOWNSHIP FLAT GLASS SITE  
OPERABLE UNITS #1 AND #2  
NAPLATE, LA SALLE COUNTY, ILLINOIS

ORIGINAL  
JUNE 9, 2008

<u>DATE</u>	<u>AUTHOR</u>	<u>RECIPIENT</u>	<u>TITLE/DESCRIPTION</u>	<u>PAGES</u>
11/00/01	Hull & Associates, Inc.	Pilkington North America, Inc.	Health and Safety Plan for the Remedial Investigation/Feasibility Study, for the Ottawa Township Flat Glass Site <b>(SDMS ID: 299627)</b>	127
02/00/02	Hull & Associates, Inc.	Pilkington North America, Inc.	Field Sampling and Analysis Plan for the Remedial Investigation/Feasibility Study, Residential Soils, for the Ottawa Township Flat Glass Site <b>(SDMS ID: 299628)</b>	35
02/00/03	Hull & Associates, Inc.	Pilkington North America, Inc.	Work Plan for Residential Soils Excavation at the Ottawa Township Flat Glass Site <b>(SDMS ID: 299629)</b>	170
06/00/05	Hull & Associates, Inc.	Pilkington North America, Inc.	Work Plan for the Soil Arsenic Bioavailability Study in Support of the Baseline Human Health Risk Assessment for the Ottawa Township Flat Glass Site <b>(SDMS ID: 299630)</b>	40
7/00/05	Hull & Associates, Inc.	Pilkington North America, Inc.	Summary Report for Residential Soils for the Ottawa Flat Glass Site <b>(SDMS ID: 299631)</b>	1171
09/00/05	Hull & Associates, Inc.	Pilkington North America, Inc.	Work Plan Addendum for the Remedial Investigation/Feasibility Study, Residential Soils, for the Ottawa Township Flat Glass Site (Revised) <b>(SDMS ID: 299632)</b>	56

<u>DATE</u>	<u>AUTHOR</u>	<u>RECIPIENT</u>	<u>TITLE/DESCRIPTION</u>	<u>PAGES</u>
08/00/07	Hull & Associates, Inc.	Pilkington North America, Inc.	Remedial Investigation and Baseline Human Health Risk Assessment, Operable Unit 1, for the Ottawa Township Flat Glass Site <b>(SDMS ID: 299633)</b>	552
09/00/07	Arcadis BBL	Pilkington North America, Inc.	Remedial Investigation and Baseline Risk Assessment Report, Illinois River Sediment Operable Unit, for the Ottawa Township Flat Glass Site <b>(SDMS ID: 299634)</b>	489
04/00/08	Hull & Associates, Inc.	Pilkington North America, Inc.	Work Plan for Residential Soils Excavation Operable Unit 1 for the Ottawa Township Flat Glass Site <b>(SDMS ID: 299635)</b>	202
04/24/08	Ratliff. G., IL EPA	Adler, K., U.S. EPA	Letter re: Comments on the Work Plan for Residential Soils Excavation, Operable Unit 1, and the Proposed Plan for the Ottawa Township Flat Glass Site <b>(SDMS ID: 299636)</b>	1



# ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

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James R. Thompson Center, 100 West Randolph, Suite 11-300, Chicago, IL 60601 • (312) 814-6026

PAT QUINN, GOVERNOR

DOUGLAS P. SCOTT, DIRECTOR

217-524-1655

August 11, 2009

Ms. Sharon J. Jaffess  
United States Environmental Protection Agency  
Superfund Division  
77 West Jackson Boulevard  
Mail Code S-5J  
Chicago, Illinois 60604-3507

Re: 0990600002 – LaSalle County  
Ottawa Township Flat Glass  
ILD 005 468 616  
Superfund/Technical Reports

Dear Ms. Jaffess:

The purpose of this letter is to transmit the formal concurrence of the State of Illinois the Record of Decision (ROD) for the Operable Units 1 (Residential Soils Operable Unit) and 2 (Illinois River Sediment Operable Unit) of the Ottawa Township Flat Glass Superfund Alternative Site in Naplate, LaSalle County, Illinois.

If you should have any questions, need any additional information, or require any assistance regarding this matter, please contact me at 217-524-1655 or via electronic mail at: [clarence.smith@epa.state.il.us](mailto:clarence.smith@epa.state.il.us).

Respectfully,

A handwritten signature in black ink, appearing to read "Clarence L. Smith".

Clarence L. Smith, Manager  
Federal Site Remediation Section  
Division of Remediation Management  
Bureau of Land

Attachments

August 11, 2009

Letter to Ms. Sharon J. Jaffess

Regarding the Ottawa Township Flat Glass Superfund Alternative Site  
Operable Units 1 and 2

Page 2 of 2

bcc: Bureau File  
Robin M. Albarracin  
Terry G. Ayers  
Gary P. King  
Clarence L. Smith  
Bureau Chief's File

## **DECLARATION FOR THE RECORD OF DECISION**

Selected Remedial Alternatives for the  
Residential Soils Operable Unit  
and the  
Illinois River Sediment Operable Unit  
of the

**Ottawa Township Flat Glass Superfund Alternative Site**  
Naplate, LaSalle County, Illinois

### **SITE NAME AND LOCATION**

Ottawa Township Flat Glass Superfund Alternative Site  
Residential Soils Operable Unit (OU 1) and Illinois River Sediment Operable Unit (OU 2)  
Illinois Identification Number: 990600002– LaSalle County  
CERCLIS Identification Number: ILD 005 468 616  
Naplate, Illinois

### **Statement of Basis and Purpose**

This decision document presents the selected remedial actions for the Residential Soils Operable Unit (OU 1) and the Illinois River Sediment Operable Unit (OU 2) of the Ottawa Township Flat Glass (OTFG) site in Naplate, La Salle County, Illinois (CERCLIS Identification Number ILD005468616). The site is also known as the Libbey-Owens-Ford (LOF) Plants 5 and 7 site.

The United States Environmental Protection Agency (USEPA), in consultation with the Illinois Environmental Protection Agency (Illinois EPA), chose the remedies in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA or Superfund) and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP, 40 Code of Federal Regulations (CFR) 300-399). Our decisions are based on the Administrative Record for the OTFG site.

### **Description of the Selected Remedies**

USEPA, in consultation with Illinois EPA, has determined that for the Residential Soils OU, no further remedial action is necessary to protect public health or welfare or the environment. We have also determined that for the Illinois River Sediment OU, no remedial action is necessary to protect public health or welfare or the environment.

The selected remedial action for the Residential Soils OU allows for unlimited use of the entire Naplate residential area including the two residential lots that were cleaned up under a prior removal action. The selected remedial action also allows for unrestricted exposure to residual and/or naturally-occurring arsenic levels in the entire Naplate residential area except at the single residential lot whereupon a residual amount of potentially contaminated soil appears to lie

DECLARATION FOR THE RECORD OF DECISION  
Ottawa Township Flat Glass Superfund Alternative Site  
Page 2 of 3

beneath a corner of the house foundation. However, the potentially responsible party (PRP) has already applied an institutional control (IC) to the property deed to help maintain protectiveness.

The selected remedial action for the Illinois River Sediment OU allows for unlimited use of the Illinois River sediment and unrestricted exposure to naturally-occurring and/or site-derived arsenic levels in the sediment, except for a designated small stretch of river adjacent to the glass-making facility. At this designated stretch of river, the projected maximum site uses involve trespassing or recreational exposures and, therefore, no adverse human health risks are calculated to occur. Here, USEPA recommends that the site owner erect "No Trespassing" signs along the river bank as well as working with those entities that maintain navigational charts for the Illinois River to place anchorage or landing restrictions on the charts for this stretch of the river. USEPA, in consultation with Illinois EPA, will periodically monitor the future site use assumptions for this small area to maintain protectiveness.

This Record of Decision (ROD) does not address the Groundwater OU (OU 3) and Source Area OU (OU 4) of the OTFG site. USEPA will address these operable units in a subsequent ROD for the OTFG site.

### **Statutory Determinations**

USEPA, in consultation with Illinois EPA, has determined that at the Residential Soils Operable Unit, no further remedial action is necessary to protect public health or welfare or the environment. The PRP has undertaken previous response actions at the site and subsequent soil sampling results and the baseline human health risk assessment calculations demonstrate that these response actions have eliminated the need to conduct further remedial action at this OU.

USEPA, in consultation with Illinois EPA, has also determined that at the Illinois River Sediment Operable Unit, no remedial action is necessary to protect public health or welfare or the environment. The baseline ecological and human health risk assessment calculations demonstrate that no current or potential future site conditions or uses pose unacceptable risks to human health or the environment at this OU.


USEPA will perform a statutory Five-Year Review at the designated residential lot and the Illinois River segment next to the facility where arsenic is found above background levels because the selected remedial actions will result in a hazardous substance, pollutant, or contaminant (i.e., arsenic) to remain on small parts of the site in excess of levels allowing for unlimited use and unrestricted exposure. USEPA will continue to perform statutory Five-Year Reviews of the selected remedial actions at the OTFG site until conditions allow for full unlimited use and unrestricted exposure at these operable units.

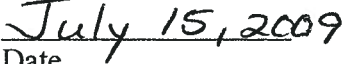
DECLARATION FOR THE RECORD OF DECISION  
Ottawa Township Flat Glass Superfund Alternative Site  
Page 3 of 3

**State Concurrence**

The State of Illinois concurs with the selected remedies. This Declaration will be attached to this Record of Decision upon receipt.

**AUTHORIZING SIGNATURE**

  
\_\_\_\_\_  
Douglas P. Scott, Director  
Illinois Environmental Protection Agency

  
\_\_\_\_\_  
Date

## Glossary

Ottawa Township Flat Glass Site  
Naplate, La Salle County, Illinois

Note: The following terms or expressions may be used throughout this document:

**Carcinogenic risk:** The incremental probability that an individual will develop cancer over a lifetime as a result of exposure to a carcinogen. A risk number is usually expressed in scientific notation (e.g.,  $1 \times 10^{-6}$ ) and is referred to as an “excess lifetime cancer risk” (or “ELCR”) because it would be in addition to the risk that individuals face of developing cancer from other potential causes such as smoking or exposure to too much sunlight. An excess lifetime cancer risk of  $1 \times 10^{-6}$  indicates that an individual experiencing the reasonable maximum exposure to a carcinogen at a site has an extra one in one million chance of developing cancer over his/her lifetime. (The probability of an individual in the U.S. developing cancer from all other causes has been estimated to be as high as one in three.) U.S. EPA generally cleans up Superfund sites to achieve an excess lifetime cancer risk range of  $1 \times 10^{-4}$  to  $1 \times 10^{-6}$ .

**Gram (g):** Metric unit of mass and weight measurement (about 28.3 grams equal one ounce).

**Hazard Index (HI) Quotient:** The ratio of the amount of a non-carcinogenic chemical contaminant that an individual may be exposed to at a site to the amount of the contaminant that causes an adverse toxic reaction within the body. An HI quotient of 1 or more means that there is enough contaminant at the site to cause a toxic reaction in a person should one be exposed to the contaminant. U.S. EPA generally cleans up Superfund sites to achieve a HI quotient of less than 1 for non-carcinogenic compounds.

**Kilogram (kg):** Metric unit of mass and weight measurement equal to 1000 grams (about 2.2 pounds or about 1 liter of pure water).

**Liter (L):** Metric unit of volume measurement (about 3.78 liters equal one gallon).

**Micro ( $\mu$ ):** Prefix denoting one millionth part of something. Example: 1 microgram ( $\mu\text{g}$ ) is one millionth of a gram.

**Milli (m):** Prefix denoting one thousandth part of something. Example: 1 milligram (mg) is one thousandth of a gram.

**Operable Unit (OU):** U.S. EPA sometimes divides up a complex cleanup site into discrete portions, termed operable units, to better manage the overall cleanup action. At the Ottawa Township Flat Glass site, OU #1 is the Residential Soils, OU #2 is the Illinois River Sediment, OU #3 is the Groundwater and Source Areas South of the Illinois River, and OU #4 is Groundwater and Source Areas North of the Illinois River.

## Acronyms and Abbreviations

ARAR	Applicable or Relevant and Appropriate Requirements
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act (Superfund)
CFR	Code of Federal Regulations
COC	Contaminant of concern
ELCR	Excess lifetime cancer risk
FR	<i>Federal Register</i>
FS	Feasibility Study
HI	Hazard Index
IAC	Illinois Administrative Code
IL EPA	Illinois Environmental Protection Agency
LOF	Libbey-Owens-Ford
mg/kg	Milligrams per kilogram ("parts per million")
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
OTFG	Ottawa Township Flat Glass
OU	Operable unit
ppb	Parts per billion
ppm	Parts per million
RCRA	Resource Conservation and Recovery Act
RI	Remedial investigation
ROD	Record of Decision
TACO	Tiered Approach to Cleanup Objectives (Illinois Administrative Code)
U.S. EPA	United States Environmental Protection Agency
yd <sup>3</sup>	Cubic yard





**Figure 2:** Aerial view of the OTFG site. The red line denotes the facility property boundaries and the yellow outlines the Original Sand Pond area (see text). Naplate residential areas are at the top of the frame and the Illinois River is at the lower right.

The LOF glass manufacturing plant has been making flat glass products in Naplate, Illinois since about 1908. Arsenic trioxide was a minor ingredient in the manufacturing process from 1908 until 1970 when its use was discontinued. The final step in the flat glass manufacturing process involved grinding and polishing (G&P) the cast glass with fine silica sand and water. The process generated waste in the form of a slurry (“G&P slurry”) consisting of mostly sand, water, and glass particles containing arsenic which was discharged into the nearby former quarries and other areas such as the “Original Sand Pond” for settling of solids and discharge of overflow water into the Illinois River. The G&P slurry in the settling areas contains appreciable levels of arsenic and can be or is a source of arsenic contamination to the environment.

The United States Environmental Protection Agency (U.S. EPA) (“we” or “us”) is the lead agency and the Illinois Environmental Protection Agency (IL EPA) is the support agency at the OTFG site. The site is a potentially responsible party (PRP)-lead site; to date, the PRP has performed a time critical removal action, a remedial investigation, and baseline human health and ecological risk assessments under U.S. EPA oversight. In addition, the PRP has a feasibility study for groundwater cleanup currently underway.

U.S. EPA has divided the OTFG site into four portions, called "operable units" (OU), for ease of investigating and addressing site contaminant levels and potential health risks. These include the Residential Soils (OU #1), Illinois River Sediment (OU #2), Groundwater and Source Areas south of the river (OU #3), and Groundwater and Source Areas north of the river (OU #4).

## **B. Site History and Enforcement Activities**

### Site History

The Federal Plate Glass Company built and began operating the glass manufacturing facility in 1908. National Plate Glass (for which Naplate, IL is named) bought the facility in 1921. National Plate Glass had become a subsidiary of Fisher Body in 1920 and Fisher Body in turn became a wholly-owned subsidiary of General Motors Corporation in 1926. National Plate Glass sold the Naplate glass plant to the Libbey-Owens-Ford (LOF) Company of Toledo, Ohio, in 1931.

From 1908 to 1970 the facility's glass-making recipe contained one percent or less arsenic (as arsenic trioxide) to reduce discoloration caused by trace amounts of iron in the melt. The final step in the flat glass manufacturing process involved grinding and polishing (G&P) the cast glass with fine silica sand and water. The process generated waste in the form of a slurry ("G&P slurry") consisting of mostly sand, water, and glass particles containing arsenic. The G&P slurry was discharged into nearby former silica sand quarries and other areas for settling of solids and discharge of overflow water into the Illinois River. In 1970, the facility began using the recently-invented Pilkington "float glass" manufacturing method. The float method did not require the use of arsenic or a G&P step, thus, large-scale discharge of arsenic-containing G&P slurry material onto the site was discontinued.

Pilkington North America, Inc. (PNA) purchased the glass manufacturing facility from LOF in 1986, about 16 years after the use of arsenic in the glass-making process was discontinued. PNA continues to operate the glass manufacturing plant to date.

### Enforcement

Illinois EPA managed the OTFG site investigations from the mid-1980s until 1999 when it referred the site to U.S. EPA. U.S. EPA reached an agreement with PNA, the current site owner, in September 2001 whereby the OTFG site would be handled as a Superfund Alternative Site (SAS), or as if it were listed on the Superfund National Priorities List (NPL) even though it did not have to go through the formal NPL site-listing process. U.S. EPA and PNA also signed an Administrative Order on Consent (AOC) in September 2001 under which PNA would conduct a remedial investigation (RI) and feasibility study (FS) at the site under U.S. EPA oversight. PNA has been conducting remedial investigation activities at the OTFG site in accordance with the AOC to determine the nature and extent of (arsenic) contamination in area groundwater, soil, and sediment.

## Previous Site Cleanup Actions

PNA conducted soil sampling in several Naplate residential areas in late 2002 and discovered elevated levels of arsenic in shallow (0 to 6 inches) and deep (greater than 12 inches) sampling points on two residential lots (417 and 419 22<sup>nd</sup> Ave.) located close to the factory. Soil arsenic levels were found to be as high as 44,800 milligrams per kilogram (mg/kg or "parts per million" or "ppm") on parts of these lots. In contrast, U.S. EPA's removal action trigger point for arsenic levels in residential soil is about 100 ppm. PNA later determined that fill material containing G&P slurry solids had been taken from the facility and used to fill in low spots so that a home could be built on one of the lots.

U.S. EPA, therefore, issued an order to PNA under the terms of the AOC to conduct a time-critical removal action at the two residential yards and, in December 2003, PNA began digging up soil and G&P slurry material that contained arsenic levels generally above about 20-40 ppm instead of the 100 ppm trigger value. The lower value was used as the target cleanup level because PNA reasoned that a potential future remedial action at the site might need to achieve a lower cleanup standard than 100 ppm. Thus, it could be more cost effective to complete a single cleanup action instead of potentially having to come back and re-open the excavations to complete a second cleanup action.

PNA safely excavated a total of 3,325 cubic yards of soil and G&P slurry material and disposed of it in an off-site landfill. While this work was being done the residents of the two homes were temporarily relocated to a local hotel. After sampling the edges and bottoms of the excavations to confirm that all impacted soils had been removed, PNA placed clean soil backfill into the excavations and reseeded the lots. The removal action was completed in June 2004. The homes were also found to have above-normal levels of arsenic-laden dust inside and PNA performed an interior cleanup action in 2004 for the home at 419 22<sup>nd</sup> Ave. and in 2006 for the home at 417 22<sup>nd</sup> Ave. to reduce the interior arsenic levels to safe levels.

## **C. Community Participation**

U.S. EPA, in consultation with IL EPA, issued a proposed plan fact sheet for the Residential Soils and Illinois River Sediment operable units of the OTFG site to the public for review and comment in June 2008. U.S. EPA placed the proposed plan and other site documents into the Administrative Record file and the information repository maintained at the U.S. EPA Records Center (U.S. EPA Region 5, 77 W. Jackson Blvd., Chicago, IL) and at the Reddick Library (1010 Canal St., Ottawa, IL). We placed a notice of the availability of the proposed plan and other documents in the *Ottawa Times*, an area newspaper of wide circulation, also in June 2008.

U.S. EPA opened a public comment period on the proposed plan from June 16, 2008 to July 16, 2008. We held a public meeting on June 24, 2008 at the Naplate Village Hall to present the proposed plan and take public comment. We answered questions at the meeting about the actual or potential health risks posed by contaminants at the site and why we proposed that the No Action alternative be our response action for these two

operable units. Our responses to public comments received during the comment period are included in the Responsiveness Summary section of this Record of Decision.

#### **D. Scope and Role of the Operable Units**

U.S. EPA divided the OTFG site into four operable units (OU), for ease of investigating and addressing site contaminant levels and potential health risks. These include the Residential Soils (OU #1), Illinois River Sediment (OU #2), Groundwater and Source Areas south of the Illinois River (OU #3), and Groundwater and Source Areas north of the Illinois River (OU #4).

This Record of Decision (ROD) addresses the first two operable units, Residential Soils (OU #1), Illinois River Sediment (OU #2). The previous response action taken at OU #1 under U.S. EPA's CERCLA removal authority has removed arsenic-contaminated soil from the residential area, leaving residual arsenic levels in the soil at or below general background levels for metropolitan counties in Illinois. Additionally, U.S. EPA found that no response activity is necessary to protect human health or the environment at OU #2. Thus, U.S. EPA plans no further cleanup activity at either of these two operable units.

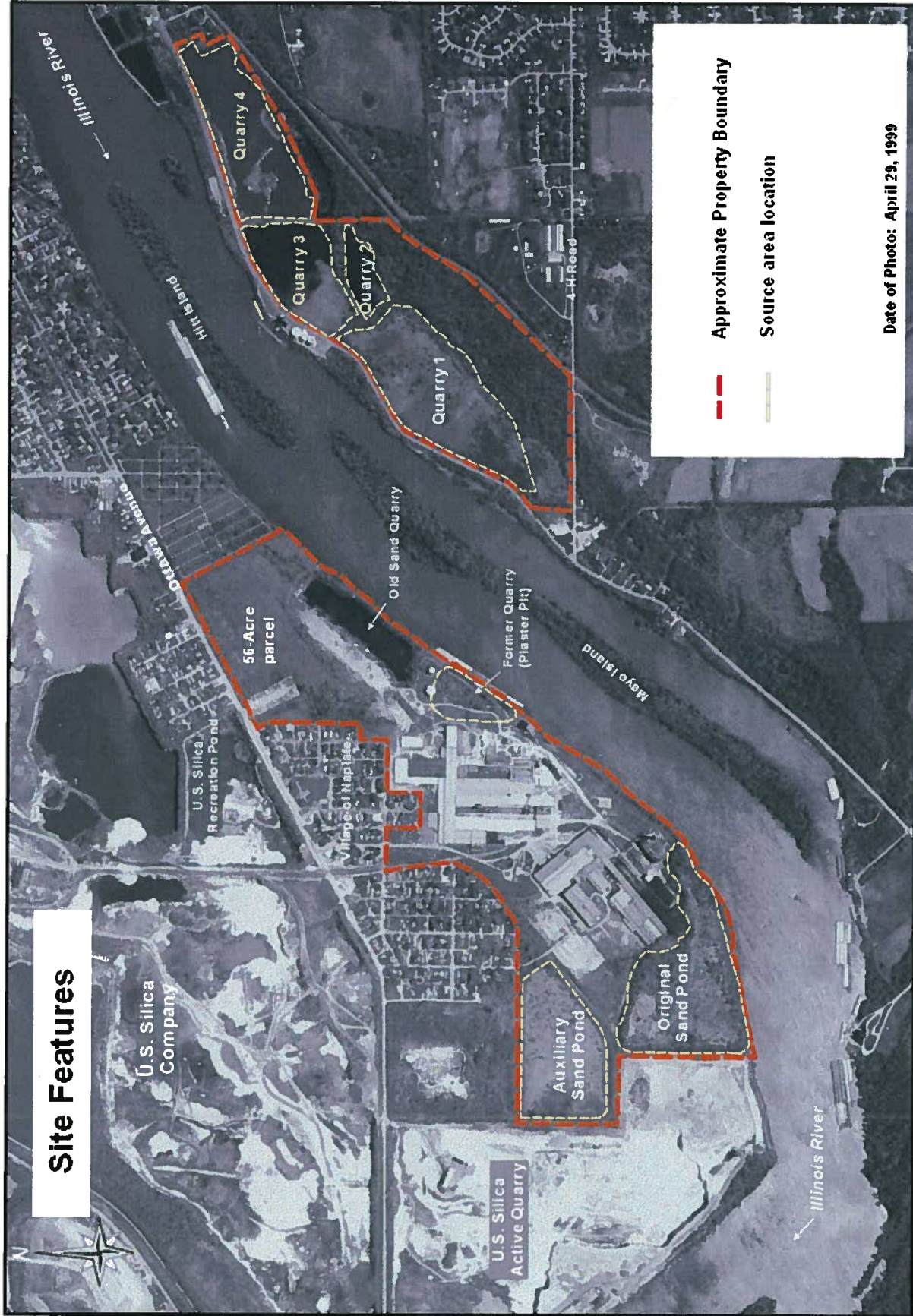
U.S. EPA and IL EPA are beginning to evaluate potential response actions for the last two operable units, Groundwater and Source Areas south of the Illinois River (OU #3), and Groundwater and Source Areas north of the Illinois River (OU #4). The response actions will address the arsenic contamination in the St. Peter Sandstone aquifer beneath the site and the potential sources of arsenic in the former settling ponds. Ingestion of water extracted from the St. Peter Sandstone aquifer could pose a current and potential future risk to human health because U.S. EPA's acceptable risk range is exceeded and the concentration of arsenic is greater than the maximum contaminant level for drinking water (as specified in the Safe Drinking Water Act). The response actions for the groundwater operable units would represent the final response actions for this site. We estimate that we will release a proposed groundwater cleanup plan for public comment in about summer 2009 and issue a final ROD in about fall 2009.

Note: The operable units do not address conditions inside the plant buildings or the buildings themselves because the plant is an operating facility regulated under RCRA.

#### **E. Site Characteristics and Investigation Results**

The 228-acre OTFG site consists of the property containing a glass manufacturing facility ("Plant #5" (active) and "Plant #7" (currently inactive)) located on the north side of the Illinois River plus former silica sand quarries, wastewater disposal areas, and a 56-acre undeveloped parcel of land. It also includes additional former silica quarries and wastewater disposal areas across from the facility on the south side of the river. (See Figure 3, next page.)

The Naplate residential area is located around the north side of the facility and topography in this area is generally flat. Naplate contains about 220 properties, a few



**Figure 3: Site features**

of which have light commercial uses (except for the glass plant). Active silica quarries owned by others lie to the west of the plant. The drop-off from the site into these quarries is very steep. The Illinois River flows from the southeast to south of the plant and the drop-off from the Original Sand Pond area into the river is also very steep.

As recounted above, from 1908-1970 the facility's glass-making recipe contained one percent or less arsenic to reduce discoloration caused by trace amounts of iron in the melt. The final step in the manufacturing process involved grinding and polishing the cast glass with fine silica sand and water. The process generated waste in the form of a slurry ("G&P slurry") mostly consisting of silica sand, glass particles containing arsenic, and water which was discharged into nearby former silica sand quarries and other areas for settling of solids and discharge of overflow water into the Illinois River. One of the discharge areas, known as the Original Sand Pond (OSP), contains many thousands of cubic yards of G&P slurry material.

The conceptual site model (see Figure 4, next page) for the Residential Soils OU demonstrates that the OSP could be a source of arsenic contamination in the Residential Soils operable unit and, similarly (although not depicted), in the Illinois River Sediment operable unit, leading to potential human or ecological receptor exposures by incidental ingestion or dermal contact. The OSP and the other arsenic contaminant source areas are potential exposure points via dermal contact or incidental ingestion as well as being potential sources of arsenic contamination to area groundwater. Ingestion or dermal contact exposure to arsenic in groundwater would potentially come from potable uses such as drinking, cooking, or bathing.

Based on the conceptual site model, the Residential Soils investigation focused on answering the question whether unsafe levels of arsenic were released into the village from the plant or from the settling ponds. Therefore, limited soil sampling was initiated in areas directly adjacent to the plant and later expanded to the entire village when results warranted it. In addition, the Illinois River Sediment investigation focused on answering the question of whether unsafe levels of arsenic were released into the river due to erosion of material from the OSP or other potential source areas. Therefore, sediment and water column sampling results were taken and/or evaluated for a stretch of river a few miles upstream (to determine background conditions) and a few miles downstream to the nearby Starved Rock lock-and-dam facility.

### Residential Soils

PNA conducted soil sampling in several Naplate residential areas in late 2002 and discovered elevated levels of arsenic in shallow (0 to 6 inches) and deep (greater than 12 inches) sampling points on two residential lots (417 and 419 22<sup>nd</sup> Ave.) located close to the factory. Soil arsenic levels were found to be as high as 44,800 milligrams per kilogram (mg/kg or "parts per million" or "ppm") on parts of these lots. In contrast, U.S. EPA's removal action trigger point for arsenic levels in residential soil is about 100 ppm. PNA later determined that fill material containing G&P slurry solids had been taken from the facility and used to fill in low spots so that a home could be built on one of the lots.

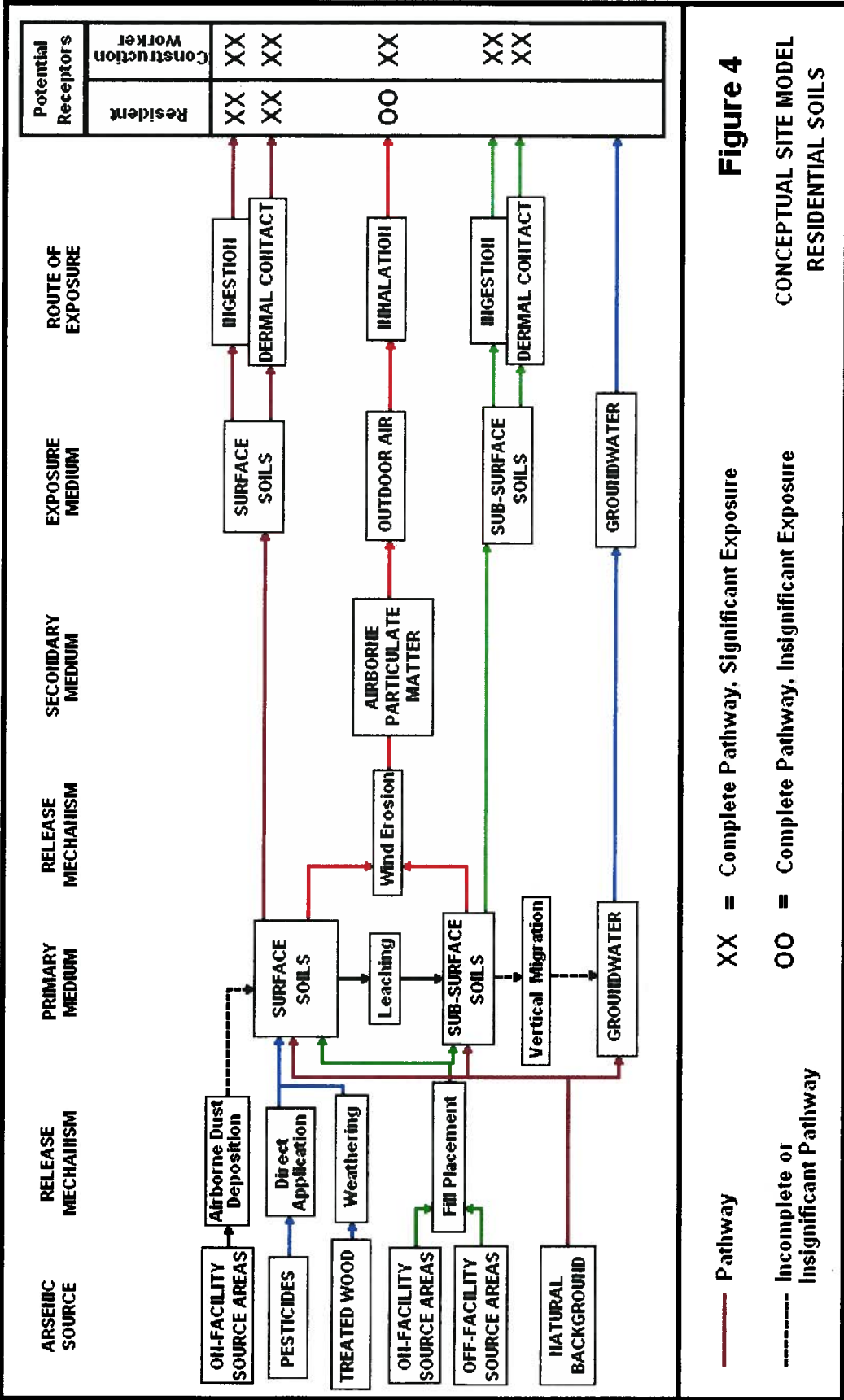


Figure 4: Conceptual Site Model for the Residential Soils Operable Unit

The other lots sampled at this time did not have levels of arsenic above 100 ppm in the soil.

PNA expanded the residential sampling program in 2003 to include additional testing at residences located very near the area of the two impacted properties. The residential soil-sampling program was expanded again in fall 2005 to cover most or all of the homes or lots in the village. Over 2000 soil samples were taken by PNA at the OTFG site, from about 210 Naplate residential lots, and analyzed for arsenic (see Figure 5, below). About 21 residential lots and 3 commercial properties were not sampled either because access was not granted or there were no exposed soil areas to sample. Results of the soil analyses were tabulated and presented in the *Remedial Investigation Report for the Residential Soils Operable Unit* (August 2007). Results indicate that G&P slurry material has not been placed as fill on any other village lots.



**Figure 5:** Residential Soils sampling locations in Naplate, Illinois.

As presented in the RI Report, surface soil samples (0-6 inches) were taken from five discrete locations in each sampled residential area and a composite sample of the five discrete samples was made and analyzed for arsenic. Yards less than 7000 sq. ft. in area were divided in half and two composite samples were taken. Yards over 7000 sq ft. were divided into quarters and four composite samples were taken. The discrete samples were also tested for arsenic in cases where the composite sample arsenic concentration exceeded 10 ppm. Deep samples were also taken on a one-acre grid

unless the composite sample exceeded 40 ppm. If a composite sample exceeded 40 ppm then a sample was also taken at depth in that area.

### Background Arsenic Levels

A literature search revealed a range of 1 ppm to 24 ppm for reported state-wide naturally-occurring or background arsenic values in soil. Site-specifically, the 56-acre open parcel of land adjacent to the "Old Sand Quarry" (see Figure 3) was selected as an area potentially not impacted by arsenic contamination and thus a source of background samples for the site. This parcel was reportedly used as a golf course for the glass plant executives in the past although it is not in use today. PNA took 23 soil borings from this area for arsenic analysis. Results ranged from 1.5 ppm to 8.7 ppm, confirming that the 56-acre parcel is not impacted by potential arsenic releases from the plant. The calculated 95% upper confidence limit (UCL) value was 9.8 ppm for this data set, meaning that the site-specific background arsenic level is considered to be 9.8 ppm.

### Results

A general review of the arsenic concentration trends in the residential area samples shows that the composite soil arsenic levels were less than or equal to 10 ppm in a great majority (approximately 65 percent) of the sampled areas. Another 33 percent of the sampled areas had composite soil arsenic concentrations of 10 ppm to 20 ppm. In comparison, the composite soil arsenic levels of 98 percent of sampled areas are consistent with the state's published background level of 13 mg/kg (ppm)<sup>1</sup>. Since 13 ppm is an average background soil arsenic level due to anthropogenic sources, U.S. EPA believes it is reasonable to assume that some non-rural areas would be higher than 13 ppm and some lower. Hence a range of 10-20 ppm for the composite samples can generally be thought of as being consistent with this value.

The last 2 percent of the sampled areas, or seven residential yards and one area in an alley, had composite arsenic concentrations of 20 ppm to 30 ppm or more. In these 8 areas, an individual sample arsenic concentration in the range of 50 ppm to 109 ppm was found, yielding the slightly higher composite results. The highest composite result for arsenic was 35 ppm.

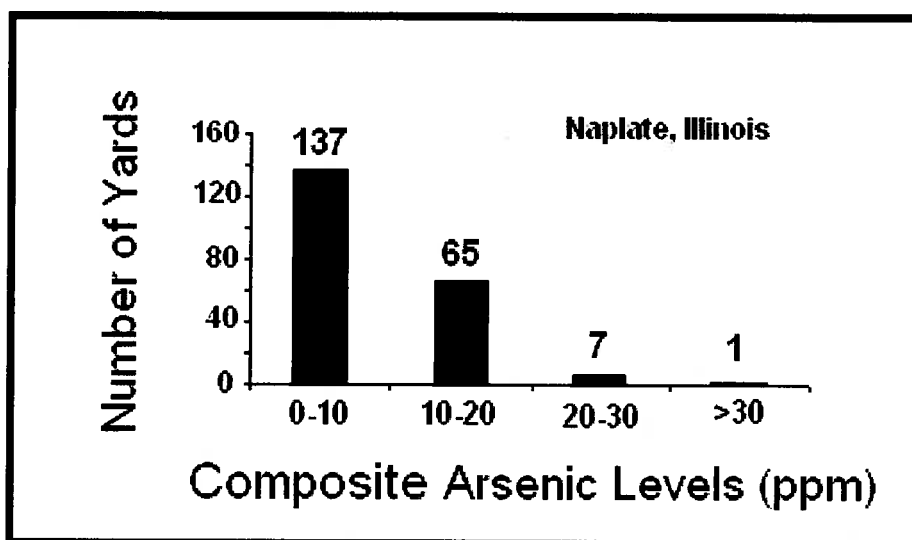
Figure 6 (next page), shows the distribution of composite soil arsenic levels in Naplate.

### Illinois River Sediment

PNA and others began testing the Illinois River environment for arsenic before the 2001 RI/FS AOC was signed. PNA both collected sediment samples and conducted bathymetric surveys. With regards to sediment, PNA had characterized arsenic content in local river sediment in 2000. Data indicated an area of potential concern along the

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<sup>1</sup> This applies to regional soil arsenic concentrations in counties within metropolitan areas (source: Illinois EPA, Part 742 Tiered Approach to Corrective Action Objectives (TACO) program).



**Figure 6:** Distribution of sampled Residential Soils areas versus composite soil arsenic levels.

north side of the Illinois River next to the Original Sand Pond (OSP) (see Figure 3, above on page 3, and Figure 7, next page).

PNA took 33 sediment samples upstream of the OTFG site. These samples were considered to be background samples or those unaffected by the site. Arsenic values ranged from not detected (ND) to 13 ppm, averaging about 5 ppm, verifying that the upstream area sediment is not impacted by arsenic from the site.

PNA took over 100 sediment samples along the OSP shoreline, with arsenic values ranging from ND to 428 ppm. The average was about 50 ppm, although half the samples were less than 18 ppm. The above-background values indicate that the sediment along the OSP shoreline is impacted by arsenic contamination from the site.

Over 100 samples were taken from the south side of the river near the glass plant location and also downstream. Arsenic values ranged from ND to 29 ppm, averaging about 4 ppm, which verifies that the sediment in these areas is not impacted by arsenic from the site.

The U.S. Geologic Survey also has sampled sediment in the Illinois River over the last 10 years or so. According to a USGS on-line database, samples taken a few miles upstream (near the Marseilles lock-and-dam) had arsenic values ranging from 1 ppm to 7 ppm. Downstream sediment samples (from the Starved Rock lock-and-dam area) had arsenic values at about 1 ppm. This data also indicates that the site has not impacted the sediment in these areas.

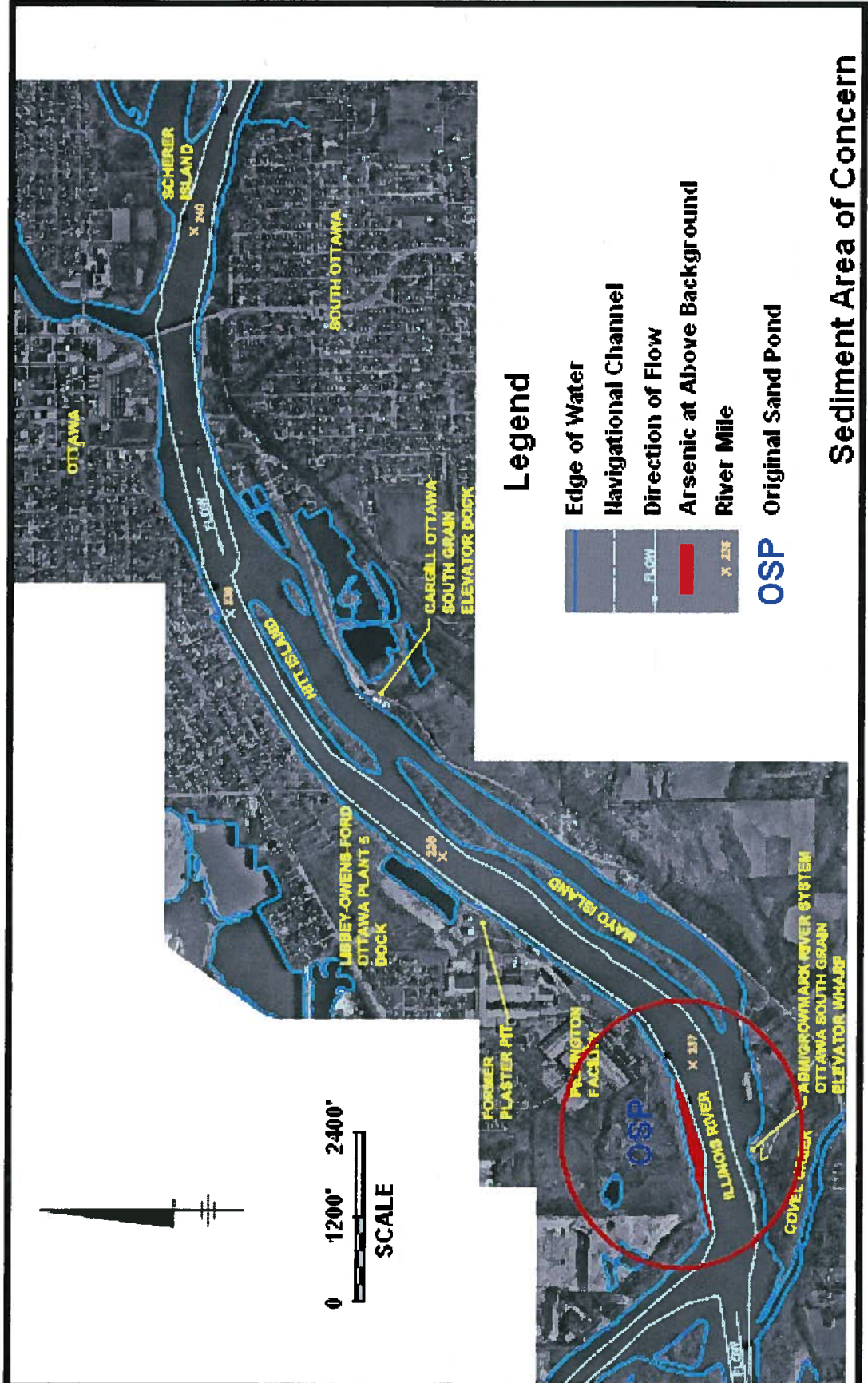


Figure 7: Arsenic-impacted Illinois River sediment.

U.S. EPA has concluded, therefore, that the arsenic values in the sediment adjacent to the OSP are above background levels and that arsenic values in sediment elsewhere in the operable unit are comparable to or below background levels.

After the AOC was signed, PNA performed additional sediment work in 2002 to determine if the sediment deposits by the OSP were stable, to more fully characterize the arsenic concentrations therein, and to examine whether the above background arsenic levels had an adverse impact on any benthic organisms living in the sediment.

PNA also looked at water quality data for the river from samples taken by others in the 1990s. These sample results showed that there were no measurable levels of arsenic from the site in river water.

PNA conducted radioisotope studies on the OSP-area sediment and that data suggest that the sediment deposit was laid down in the 1950s. It also suggests that the deposit is stable and not subject to wash out by yearly flooding.

IL EPA conducted bioassay studies on OSP-area sediment in about 1990. Data showed that the sediment imparted no acute toxicity effects on the sensitive test organisms. PNA conducted tests in 2002 on benthic organisms and data showed some chronic effects; however, there was no discernible difference between upstream and downstream chronic toxicity effects on test benthic organisms. Thus, no fish sampling was done because literature suggests that health impacts on fish occur at arsenic levels that are at least an order-of-magnitude above that of benthic organisms.

U.S. EPA can therefore conclude that the sediment in the Illinois River along the shoreline next to the OSP is very stable – it wouldn't be prone to being washed away by river water, that it has very little or no effect on river water quality, and that it displays very little or no toxicity (attributable to arsenic) to aquatic organisms.

The Residential Soils and Illinois River Sediment results were evaluated with respect to actual or potential human health or ecological risks, with results discussed in Section G, below.

## **F. Current and Potential Future Land and Resource Uses**

The Residential Soils operable unit essentially encompasses the entire Village of Naplate, Illinois, population 523 (2000 census). Except for the glass plant property, the current land use is primarily residential with a few small businesses also present. Future land use is reasonably assumed to remain the same as current use.

The Illinois River is used for navigation (barge traffic) and recreational (fishing, pleasure boating) purposes and rarely for swimming. Since the river connects Lake Michigan with the Mississippi River, commercial use of the Illinois River is very important to the economy. Thus, it is reasonable to assume that future use would remain the same as today.

## **G. Summary of Site Risks**

U.S. EPA generally follows a four-step process for preparation of the baseline human health risk assessment (HHRA) at Superfund sites:

1. Identify chemicals of concern (COCs)
2. Conduct an Exposure Assessment for COCs
3. Conduct a Toxicity Assessment of COCs
4. Characterize Risk and Evaluate Uncertainties

U.S. EPA evaluated the levels of chemicals found in the Residential Soils and Illinois River Sediment operable units to determine the actual or potential risks to human health and the environment. (We also evaluated risks for groundwater, but we are not selecting a groundwater cleanup method in this ROD so actual or potential groundwater risks will not be discussed herein.) As stated above, the first step we took was the identification of “chemicals of potential concern” (COPCs) - those compounds that exceeded health-based levels at the site - using screening levels or preliminary remediation goals published by the State of Illinois and/or U.S. EPA. We then winnowed down the list of COPCs to “chemicals of concern” (COCs) – those compounds that are most pervasive at the site or most representative of a chemical class.

We next evaluated chemical fate and transport factors to determine whether the COCs were potential short-, medium-, or long-term risks at the site. We then examined potential pathways of concern to human health and the environment under current and future site-use scenarios in an exposure assessment and we applied the results of the above steps to quantify actual or potential risks to human health and the environment by combining exposure level assumptions with estimated carcinogenic risk or toxicity factors for the COCs. The human health and ecological risk assessment work is fully presented in the RI Report for the Residential Soils and for the Illinois River Sediment operable units. We have placed these RI Reports into the Administrative Record for the site.

### **1. Chemical of Concern**

Chemicals of concern (COCs) are contaminants that potentially present the greatest human health concerns (*i.e.*, those present in the highest concentrations, with the widest distribution over the site, or that exhibit the highest mobility or the highest toxicity). The purpose of identifying COCs is to focus the risk assessment on the most important contaminants found at a site.

The only COC at the OTFG site is arsenic. Arsenic trioxide is the chemical that was previously used in the flat glass formulation at the glass plant site and is the material that, due to its physical characteristics and handling, could have become entrained in the area soil if it had migrated off-site. There is no information, from on-site sampling or historical information, indicating that other chemicals were used at the facility that would

have migrated off-site, impacting the surrounding neighborhood soil or Illinois River sediment. Arsenic thus became the primary chemical that was analyzed in soil and sediment samples during the RI.

### Fate and Transport

Arsenic tends to adhere to soil and sediment particles and the mobility of this compound on these media is usually low. (Arsenic is soluble in water and is found in site groundwater wherein mobility can be moderate to high.) Arsenic bioaccumulation is moderately likely to occur in receptors and it does not biodegrade. Thus, this COC, if not addressed, will persist for years to come and be readily available for people and animals to become exposed to it.

## **2. Exposure Assessment for Arsenic**

The baseline HHRA provided an evaluation of the carcinogenic and non-carcinogenic risks at the Residential Soils OU associated with current and future exposures by residents (adult and child) and construction workers. The potential exposure routes that were quantified include ingestion (through hand-to-mouth activities), inhalation, and dermal contact (through the skin). The potential exposure routes that were quantified for the Illinois River Sediment OU include ingestion (through hand-to-mouth activities) and dermal contact (through the skin). These routes are associated with current and future exposures by recreational users (trespassers) and facility workers.

### Current Pathways

Exposure to arsenic could occur in the Residential Soils OU if people were to use or otherwise disturb areas where soil is contaminated. For example, digging in the lawn could expose a person to arsenic by dermal contact if one were to touch impacted soil, by ingestion if one were to put ones hand into the mouth, or by inhalation if dust particles were suspended into the air.

Exposure to arsenic could occur in the Illinois River Sediment OU if people or ecological receptors were to use or otherwise disturb areas where sediment is contaminated. For example, swimming in the river could expose a person to arsenic by dermal contact if one were to touch impacted mud or sediment beneath the water. Benthic organisms and bottom feeder fish such as carp could be exposed to arsenic while foraging for food.

### Future Pathways

Future exposure pathways to arsenic would be the same as current pathways as no projected land-use changes are noted.

### **3. Toxicity Assessment for Arsenic**

U.S. EPA evaluated the relationship between the magnitudes of actual or potential exposure to arsenic at the site with corresponding adverse health effects. An estimate of the increased likelihood and severity of the adverse effects was calculated and used in the assessment of risk for arsenic at the site.

Generally, adverse health effects are divided into two categories – non-cancer causing (non-carcinogenic) and cancer causing (carcinogenic). Arsenic is considered to be carcinogenic but it also causes noncarcinogenic effects. Risk calculations were performed separately for arsenic as a carcinogen and a non-carcinogen because the adverse health effects are different (*e.g.* cancer-causing versus causing kidney failure).

#### **Non-carcinogenic Effects**

Non-carcinogenic effects are evaluated using reference doses (RfD) developed by U.S. EPA. Reference doses for non-carcinogens are developed on the assumption that certain levels of contaminants may not pose ill effects to the liver or kidney, for example, due to daily exposure at threshold levels over a lifetime of exposure. The RfD for arsenic is based on human chronic oral exposure studies and includes a safety factor of 3. The RfD is based on the Lowest Observed Adverse Effect Level (LOAEL) and the critical health effects caused by arsenic include hyperpigmentation, keratosis, and possible vascular complications.

Combined with the results of the exposure assessment, we are able to calculate the Hazard Index (HI) quotient for a COC. A HI quotient is the ratio of the amount of a non-carcinogenic chemical contaminant that an individual may be exposed to at a site to the amount of the contaminant that causes an adverse toxic reaction within the body. An HI quotient of 1 or more would mean that there is enough contaminant at the site to cause a toxic reaction (likely an adverse impact to the target organs) in a person should one be exposed to the contaminant. A HI quotient of less than 1 indicates no adverse health effects would be expected due to exposure to a chemical at site concentrations.

#### **Carcinogenic Effects**

Similarly, RfDs for carcinogens are developed based on published cancer slope factors extrapolated from animal testing or other means. To calculate risk, arsenic was assigned a toxicity value in accordance with U.S. EPA's Integrated Risk Information System (IRIS). IRIS provides a database of human health effects that may result from exposure to arsenic (as well as from many other chemicals).

Studies have shown that arsenic intake can be associated with certain types of cancer such as of the lung, liver, kidney, bladder, and skin. Arsenic is a human carcinogen that can be inhaled, ingested, or absorbed; however, toxicity values provided by U.S. EPA in IRIS typically reflect doses to study subjects only via inhalation or ingestion exposure.

Using reasonable maximum exposure (RME) rates based on the results of the exposure assessment, we can calculate an excess lifetime cancer risk (ELCR) value for arsenic. An ELCR is an estimate of one's chances of contracting cancer due to lifelong exposure to a chemical at site concentrations and is usually expressed as an exponential value (e.g.  $1 \times 10^{-2}$  is 1 in 100).

#### 4. Human Health Risk

Carcinogenic risks are generally expressed as the incremental increase in the probability of an individual's developing cancer over a lifetime as a result of lifetime exposure to the carcinogen. For example, an excess lifetime cancer risk of  $1 \times 10^{-6}$  indicates that an individual experiencing the reasonable maximum exposure to a carcinogen has a 1 in 1,000,000 (one in one million) chance of developing cancer as a result of site-related exposure to the chemical. Note: calculated risk values are referred to as an "excess lifetime cancer risks" because the risks would be in addition to the more prevalent risks of cancer that individuals face due to other factors such as smoking or exposure to too much sunlight. The chance of an individual's developing cancer during ones lifetime from all other causes has been estimated to be as high as 1 in 3 ( $3.3 \times 10^{-1}$ ).

Excess lifetime cancer risk (ELCR) is calculated from the following equation:

$$\text{ELCR} = \text{CDI} \times \text{SF}$$

where:            ELCR = a unit-less probability (e.g.,  $1 \times 10^{-2}$ )  
                      CDI = chronic daily intake level (mg/kg-day)  
                      SF = slope factor, expressed as (mg/kg-day)<sup>-1</sup>

Non-carcinogenic health effects are expressed as a Hazard Index (HI) quotient. A calculated HI that is less than 1 indicates that a receptor's dose of a single contaminant is less than the RfD, and that toxic non-carcinogenic effects from that chemical are unlikely to occur. A total HI quotient can be generated by adding the HI quotient for all site-wide COCs that affect the same target organ (e.g., liver) to which a given individual may reasonably be exposed. An HI that is less than 1 indicates that, based on the sum of all HI's from different contaminants and exposure routes, toxic non-carcinogenic effects from all contaminants are unlikely. An HI greater than 1 indicates that site-related exposures may present a risk to human health.

The HI is calculated as follows:

$$\text{HI} = \text{CDI}/\text{RfD}$$

where:            CDI = Chronic daily intake  
                      RfD = reference dose.

CDI and RfD are expressed in the same units and represent the same exposure period.

### Target Risk

U.S. EPA generally cleans up Superfund sites to reduce contaminant levels or exposure to contaminants so that the estimated ELCRs posed by carcinogenic contaminants fall within a risk range of  $1 \times 10^{-4}$  to  $1 \times 10^{-6}$  (1 in 10,000 to 1 in 1,000,000) and/or the calculated HI values for non-carcinogenic compounds fall to less than 1. We may use the term “unacceptable risk” when referring to contaminants at concentrations above levels that yield estimated an ECLR greater than  $1 \times 10^{-4}$  or a HI greater than 1 after a risk assessment is performed.

### Uncertainties

Calculated ELCRs and HI values are estimates of potential upper-bound risks that are useful in regulatory decision-making. However, it is improper to consider the risk estimates to be representative of actual risk to potentially exposed individuals because the risks were estimated by making numerous conservative assumptions (that is, assumptions that over-estimate potential exposure levels and thus, potential risk) due to uncertainties inherent in the HHRA process. For example, some exposure and toxicity value assumptions have greater amounts of scientific data supporting them than others (that is, a widely-used chemical may be well-studied whereas a newer compound may not yet have any testing data associated with it). Uncertainty is also introduced into the risk assessment process every time an exposure assumption is made based on current or potential site uses.

One example of uncertainty at the OTFG site is the estimated site-specific soil ingestion rate. Estimates may vary widely. Thus, a higher U.S. EPA-recommended rate was used to yield a more conservative risk value than may be actually occurring.

PNA also elected to conduct bioavailability tests on site residential soil and G&P material. These tests are used to check to see how much arsenic in the soil is actually taken up by the body if the soil is consumed and how much merely “passes through” without causing an impact. Testing showed that about 26 percent of the arsenic in the soil is available to be absorbed into the body if tainted soil was consumed. U.S. EPA reviewed the testing data and concurs with the interpretation of the results. Usually arsenic is conservatively considered to be 95 percent bioavailable in the HHRA process. Thus, the site-specific bioavailability factor of 26 percent may yield a less conservative risk value for arsenic exposures at the OTFG site.

There are many potential man-made sources of arsenic making it potentially available to receptors beyond the naturally-occurring levels in soil or sediment. These include: rat poison and other pesticides, green-treated wood (copper arsenate), coal ash, certain fertilizers, automobile batteries, and pigments found in old paint or wallpaper. Potential use of any of these materials at a residence during ones lifetime could result in

exposure to higher levels of arsenic than from naturally-occurring or “background” sources.

## **HHRA Results**

U.S. EPA used an exposure point concentration for arsenic using a reasonable maximum exposure (RME) scenario and the central tendency exposure (CTE) scenario to estimate human health risk at the site. The term “RME” refers to exposure to the highest concentration found and is usually used as the basis for cleanup action at a Superfund site. The individual residential soil sample results, for example, would be the basis for RME risk calculations. The term “CTE” refers to an average exposure level that is more likely to occur at a site. The composite residential soil sample results would form the basis for CTE risk calculations.

For the Residential Soils operable unit, EPA used RME and CTE values to estimate health risks for residents (adults and children) and construction workers. For the Illinois River Sediments operable unit, EPA used RME and CTE values to estimate health risks for the glass plant workers and for recreational users (trespassers).

### **a. Residential Soils**

An ELCR and HI quotient were calculated for each exposure unit (residential lot) that was sampled in the village. Both adult and child residential exposure scenarios, and a construction worker scenario, were examined to determine potential health risks due to arsenic levels in the soil.

For children, the calculated RME ELCR ranged from  $1 \times 10^{-6}$  to  $2 \times 10^{-5}$  and the calculated CTE ELCR ranged from  $1 \times 10^{-7}$  to  $2 \times 10^{-6}$ . The calculated RME HI ranged from 0.05 to 1.0 and the calculated CTE HI ranged from 0.01 to 0.2. For adults, the RME ELCR ranged from  $6 \times 10^{-7}$  to  $1 \times 10^{-5}$  RME and the CTE ELCR ranged from  $5 \times 10^{-8}$  to  $7 \times 10^{-7}$ . The RME HI ranged from 0.01 to 0.1 and the CTE HI ranged from 0.001 to 0.02. Construction worker ELCR and HI values were at least ten-times lower (an order of magnitude less) than the above numbers because estimated exposure rates are lower than for residential exposures.

The HHRA thus identified that arsenic is not present at concentrations that result in an estimated risk above U.S. EPA’s target risk levels. For each of the Residential Soils areas, **none** of the areas exceeded U.S. EPA’s  $1 \times 10^{-4}$  (1 in 10,000) ELCR or HI greater than 1 action levels.

### **b. Illinois River Sediment**

A human health risk assessment was performed for the north-shore sediment deposits adjacent to the OSP. It was assumed that only recreational exposures would occur, meaning intermittent exposure to sediment by trespassers or glass plant workers

swimming in the river, but not everyday exposures as would be assumed under a residential-use scenario.

The calculated ELCR risk for potential recreational users (trespassers) and glass plant workers is less than  $1 \times 10^{-8}$  (1 in 10,000,000) and the HI is at 0.001, which are both below the target  $1 \times 10^{-4}$  (1 in 10,000) ELCR or HI greater than 1 action levels.

### **Ecological Risk Characterization**

U.S. EPA also examined the potential risks to ecological receptors based upon the arsenic levels found in Illinois River sediment next to the OSP. We assumed that aquatic, terrestrial, and avian species at the site could be exposed to contaminants through external direct contact or ingestion of impacted sediment and food. Using recommended dose limits of various arsenic compounds for terrestrial and avian biota, we concluded that there is no potential for adverse effects to terrestrial and avian species caused by arsenic in the sediment.

A survey was conducted for benthic organisms and a general lack of such species was found to be present next to the OSP mainly because the type of sediment did not provide ideal living conditions regardless of arsenic concentrations in the sediment. Nevertheless, toxicity testing was performed using the river sediment and it showed no measurable effects between upstream areas and the impacted sediment area on benthic organisms.

No fish sampling or testing was conducted at the site. Since potential arsenic discharges to the river would have ceased in 1970, measurement of the potential effects would not be possible. A literature review also showed that sampling fish to check arsenic levels is generally not recommended because studies indicate that arsenic in fish is mainly in the form of organo-arsenic compounds. Organo-arsenic compounds demonstrate low bioavailability and low toxicity effects in contrast to inorganic arsenic compounds. Although bioaccumulation of arsenic in fish can occur, biomagnification is generally not seen. Lastly, arsenic levels need to be an order-of-magnitude above those that cause adverse impacts to benthic organisms before impacts on fish are observed. Since the arsenic levels in the sediment near the OSP do not affect benthic organisms, then it is reasonable to conclude that fish are not impacted as well.

### **Conclusions**

The calculated risk levels for the Residential Soils and Illinois River Sediment OUs do not exceed U.S. EPA action levels and, therefore, no active cleanup measures need to be taken at these OUs to protect human health and the environment. Accordingly, no feasibility studies were conducted for either of these operable units because risk levels did not demonstrate a need to evaluate any active cleanup remedies.

## **H. Five-Year Review Requirement**

The removal action that occurred in the Residential Soil OU could not remove a very small amount of potential G&P slurry material located under the house foundation. PNA has placed a notice on the deed to alert the successive property owners of this and to let them know that if the house is razed, PNA is to be contacted to remove the residual G&P material. U.S. EPA will evaluate the situation in future Five-Year Review periods for the site to ensure protectiveness.

Additionally, U.S. EPA would recommend placement of a "No Trespassing" sign on the shore line area of the OSP beneath which the sediment is impacted by arsenic above background levels to ensure protectiveness. U.S. EPA will also evaluate whether projected future site-use assumptions for this area have changed during the Five-Year Review period for the site to ensure protectiveness.

## **I. Documentation of Significant Changes**

The proposed plan for the Residential Soils and Illinois River Sediment operable units of the OTFG site was released for public comment in June 2008. The proposed plan identified "No Further Action" as the preferred remedy for the Residential Soils OU and "No Action" as the preferred remedy for the Illinois River Sediment OU. U.S. EPA reviewed all written and verbal comments submitted during the public comment period. We have determined that no significant changes to the remedies, as originally identified in the proposed plan, are necessary or appropriate.

## RESPONSIVENESS SUMMARY

Ottawa Township Flat Glass Site  
Naplate, La Salle County, Illinois

U.S. EPA met the public participation requirements of Sections 113(k)(2)(B)(i-v) and 117(b) of CERCLA (42 U.S.C. §§ 9613(k)(2)(B)(i-v) and 9617(b)) during the remedy selection process for the Residential Soils and Illinois River Sediment operable units of the Ottawa Township Flat Glass (OTFG) site. Sections 113(k)(2)(B)(iv) and 117(b) require U.S. EPA to respond "...to each of the significant comments, criticisms, and new data submitted in written or oral presentations" on a proposed plan for a remedial action. This Responsiveness Summary addresses those concerns expressed by the public, potentially responsible parties (PRPs), and governmental bodies in written and oral comments we've received regarding the proposed remedy for the site.

U.S. EPA has established information repositories for the OTFG site at the following locations:

- U.S. EPA - Region 5, Records Center, 77 W. Jackson Blvd., Chicago, Illinois
- Reddick Library, 1010 Canal St., Ottawa, Illinois

The Administrative Record containing all information we used to select the cleanup remedy for the Residential Soils and Illinois River Sediment operable units is also available to the public at these locations.

### Background

U.S. EPA signed an administrative order on consent (AOC) with Pilkington North America, Inc. (PNA), the current site owner, to begin a remedial investigation and feasibility study at the OTFG site in fall 2001. PNA sampled soil, sediment, and groundwater at the site for contaminants and performed a human health and an ecological risk assessment using sampling data to determine actual or potential risks to human health and the environment posed by site contaminants. PNA completed the remedial investigations for the Residential Soils and Illinois River Sediment operable units in August and September 2007. No feasibility study was released for cleanup of either of these operable units because risk levels did not demonstrate a need to evaluate cleanup remedies.

On June 16, 2008, U.S. EPA issued a proposed plan fact sheet to the public to summarize the results of the remedial investigation and baseline risk assessments for the Residential Soils and Illinois River Sediment operable units. We also presented our recommended no action responses for each operable unit. The proposed plan was available for public comment from June 16 through July 16, 2008. We placed an advertisement announcing the availability of the proposed plan and the start of the comment period in the *Ottawa Times*, a local newspaper of wide circulation in the

Naplate area. Each fact sheet contained a U.S. EPA-addressed comment page to facilitate receipt of mailed comments. We indicated that we would accept written, e-mailed, or faxed comments during the public comment period.

U.S. EPA held a public meeting and public hearing at the Naplate Village Hall on June 24, 2008 to discuss the results of the remedial investigation, to answer any questions regarding the proposed no action responses, and to take oral comments regarding the proposed actions. About 10 people including local residents attended the public meeting. A court reporter documented the proceedings of the public meeting, and we placed a verbatim transcript of the meeting into the information repositories and the Administrative Record. We received no oral comments concerning the proposed plan at the public meeting.

U.S. EPA received two written comments concerning the proposed plan during the comment period. The comments received during the public comment period and our responses to these comments are included in this Responsiveness Summary, which is a part of the Record of Decision for the OTFG site.

### Summary of Significant Comments

#### **A. Written Comments**

##### **1. Comment**

Pilkington North America, Inc. submitted a 12-page comment letter to U.S. EPA on July 16, 2008 that detailed PNA's reasoning behind the summary comment shown below. U.S. EPA shall place the entire letter into the Administrative Record for the OTFG site and therefore shall not reproduce or respond to the entire contents here.

"PNA concurs with EPA's proposed No Further Action for OU1 and OU2 of the [OTFG] Site. The risk assessments previously submitted to EPA demonstrate that these operable units do not pose a risk to human health or environment and thus no additional cleanup is required. Additionally, PNA believes that the institutional controls it has previously recorded for 417 22<sup>nd</sup> Ave. [in Naplate, IL] are sufficiently protective and should meet EPA's requirements."

##### **1. Response:**

U.S. EPA acknowledges the support of PNA in this matter. We agree with the conclusion that no cleanup action is required for the two operable units; however, U.S. EPA will examine the institutional control (IC) that PNA states that it has placed on the 417 22<sup>nd</sup> Ave. property deed so we can determine whether the IC is sufficient or not. If not sufficient, we will work with PNA to place a sufficient IC on the 417 22<sup>nd</sup> Ave. property deed. In addition, for the Illinois River Sediment OU we recommend that a "No Trespassing" sign be placed near the Original

Sand Pond (OSP) area to prevent exposure to the above-background levels of arsenic in the sediment adjacent to the OSP not in accordance with the risk assessment (i.e. at a frequency greater than in the recreational exposure assumptions). Again, U.S. EPA will work with PNA to incorporate these recommendations.

2. Comment

Via e-mail dated 7/16/2008:

“My name is GREGORY SCOTT DETTORE. I reside in arsenic-ville, also known as Naplate. I am one of the homes that was tested for arsenic. Does it really matter to the EPA or Pilkington [former LOF plants] or any resident - well maybe the two positive inhumane homes - what the end result is? What about all the other homes in our village. Maybe that is why there is so little response to the newsletter, and meetings for further testing and or action. I personally disagree with this end result, but I am assuming that for a \$1000.00. I want to thank our government that I pay salaries to in one way or another we'll just have to live with it just as other communities do. OUR TAX DOLLARS AT WORK”

2. Response:

U.S. EPA notes that more than 90 percent of the residential lots in Naplate were tested for soil arsenic levels and results indicate that no other lots tested contained the arsenic-laden fill material found at 417 and 419 22<sup>nd</sup> Ave. Also, results showed that average soil arsenic levels were mostly equal to or less than the average soil arsenic levels in metropolitan areas of the state. Lastly, the human health risk assessment calculations show that the residential soil arsenic levels do not present an unacceptable risk to human health or the environment. Therefore, the “No Further Action” remedial alternative is the proper choice for the Residential Soils operable unit of the OTFG site.