

**Welsbach/General Gas Mantle  
Contamination Site**

May 2005



**EPA ANNOUNCES PROPOSED PLAN**

This Proposed Plan identifies the preferred No Action remedy being considered to address surface water, sediment and wetland areas at the Welsbach and General Gas Mantle Contamination Site (Welsbach Site), and provides the rationale for this recommendation.

The U.S. Environmental Protection Agency (EPA) has divided the Welsbach Site into separate cleanup phases, or operable units. On July 23, 1999, EPA, with support from the New Jersey Department of Environmental Protection (NJDEP), selected a remedy for Operable Unit 1 (OU1). The OU1 remedy included demolition of the former General Gas Mantle Building, excavation of the radiologically contaminated soil and debris at the residential, commercial, and industrial properties at the Welsbach Site, and disposal of this material in a licensed off-site facility.

This Proposed Plan addresses surface water, sediment and wetland areas at the Welsbach Site (designated Operable 3 (OU3)). Additional operable units will address potential remedies for the former Welsbach-era building known as the Armstrong Building (Operable Unit 2), and the groundwater (Operable Unit 4).

No Action, as described here, is the preferred remedy for OU3. This document is issued by EPA, the lead agency for site activities, and NJDEP, the support agency. EPA, in consultation with NJDEP, will select a final remedy for the surface water, sediment, and wetland areas at the Welsbach Site after reviewing and considering all information submitted during the 30-day public comment period. EPA, in consultation with NJDEP, may change this preferred remedy if new information or public comments indicate that such a change will result in a more appropriate remedy. Therefore, the public is encouraged to review and comment on this Proposed Plan.

Dates to remember:

**MARK YOUR CALENDAR**

**PUBLIC COMMENT PERIOD:**

**May 24 – June 23, 2005**

EPA will accept written comments on the Proposed Plan during the public comment period.

**PUBLIC MEETING: June 8, 2005 - 7:00 pm**

EPA will hold a public meeting to explain the Proposed Plan. EPA will also accept oral and written comments at the meeting. The meeting will be held at **EPA's Welsbach Field Office at the Old Broadway School, 130 N. Broadway, Gloucester City, New Jersey**. Prior to the start of the meeting, EPA will be available from 6:00 p.m. to 7:00 p.m. to answer questions.

**For more information, see the Administrative Record at the following locations:**

U.S. EPA Records Center, Region II  
290 Broadway, 18<sup>th</sup> Floor  
New York, New York 10007-1866  
(212)-637-3261  
Hours: Monday-Friday - 9 am to 5 pm

City of Camden Main Library  
418 Federal Street  
Camden, NJ 08103  
(856) 757-7650  
Hours: Monday through Thursday – 9 am to 8 pm  
Friday and Saturday – 9 am to 5 pm

Gloucester City Public Library  
Monmouth and Hudson Streets  
Gloucester City, NJ 08030  
(856) 456-4181  
Hours: Monday – 12 pm to 9 pm  
Tuesday and Friday – 9 am to 5 pm  
Wednesday and Thursday – 9 am to 9 pm  
Saturday – 10 am to 1 pm

EPA is issuing this Proposed Plan as part of its community relations program under Section 117(a) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as

amended (CERCLA) and Section 300.430(f) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This Proposed Plan summarizes information that can be found in greater detail in the Final Remedial Investigation/Feasibility Study Report (RI/FS) for Operable Unit 1 (January 1999), the Screening Level Ecological Risk Assessment (March 2002), and the Human Health Risk Assessment Addendum (January 2005), as well as other site-related documents contained in the Administrative Record file for the Welsbach Site. EPA and NJDEP encourage the public to review these documents to gain a more comprehensive understanding of the Welsbach Site and the Superfund process.

## **SITE HISTORY**

The Welsbach Site consists of two former gas mantle manufacturing sites and numerous residential properties in the cities of Camden and Gloucester City, New Jersey. The companies used thorium, a radionuclide that emits radiation during radioactive decay, as a part of the manufacturing process. Thorium made the mantles glow brightly.

Beginning around 1895, Welsbach imported monazite ore as its source for thorium for the gas mantles in its Gloucester City facility. Just after the turn of the century, Welsbach was the largest producer of gas mantles and lamps in the United States, making up to 250,000 mantles per day. The Welsbach Company appears to have disposed of the ore tailings and radiological waste materials on its property and on other properties near the facility. Welsbach went out of business in 1940.

The General Gas Mantle Company (GGM), located in Camden, New Jersey, was a small competitor to the Welsbach Company in making gas mantles. GGM operated from 1912 to 1941. There is little information on its activities. It seems that GGM only used refined thorium in its gas mantle manufacturing processes.

In May 1981, EPA sponsored an aerial radiological survey of the Camden and Gloucester City area to investigate for radioactive contaminants. The survey covered a 20-square-kilometer area surrounding the locations of the former Welsbach and GGM facilities. NJDEP evaluated the data

from the aerial survey and identified five areas with elevated gamma radiation levels. The elevated areas included the locations of the two former gas mantle manufacturing facilities and three mainly residential areas in both Camden and Gloucester City. In 1993, EPA re-analyzed the data from the aerial survey. Because of this analysis, EPA later identified a sixth area in Gloucester City with elevated gamma radiation levels.

In the early 1990s, NJDEP conducted follow-up radiological investigations at more than 1,000 properties located throughout the original five Study Areas. NJDEP identified radiological contamination at the two former gas mantle facilities and at residential properties located near the two facilities.

In 1996, EPA placed the Welsbach Site on the National Priorities List (NPL) because of this radiological contamination. EPA divided the Welsbach Site into six Study Areas in Camden and Gloucester City (see Figure 1.) A description of each Study Area follows:

- Study Area 1 includes the former GGM facility and residential and commercial properties that surround the facility. The former GGM facility is located in a mixed industrial, commercial, and residential section of Camden.
- Study Area 2 includes the location of the former Welsbach facility and nearby residential/commercial properties. The former Welsbach facility is located in an industrially zoned section of Gloucester City with residential properties immediately to the east. An original Welsbach building, the Armstrong building, is still present on the property.
- Study Area 3 includes residential and recreational properties in Gloucester City, including the Gloucester City Swim Club and the Johnson Boulevard Land Preserve.
- Study Area 4 includes residential properties in the Fairview section of Camden.

- Study Area 5 includes residential properties, vacant land, and two municipal parks near Temple Avenue and the South Branch of Newton Creek in Gloucester City.
- Study Area 6 includes vacant lots in a residentially zoned area of Gloucester City.

In September 1997, EPA began an RI/FS to investigate the radiological contamination at a number of residential and industrial properties at the Welsbach Site.

In January 1999, EPA finalized the RI/FS, and on July 23, 1999, EPA signed a Record of Decision for OU1 (1999 ROD). EPA stated in the 1999 ROD that it would address the potential site impacts to surface water, sediment, and wetland areas in the future.

In April 2001, EPA started the surface water, sediment, and wetland investigation called for in the 1999 ROD. This Proposed Plan summarizes the results of this investigation. It also describes EPA's assessment of the potential risk to human health and the environment from the radionuclide contaminants in the surface water, sediment, and wetland areas at the Welsbach Site.

## **REMEDIAL ACTIONS IMPLEMENTED TO DATE**

Thus far, EPA's cleanup of the Welsbach Site has involved four phases.

The first phase involved the demolition of the GGM Building in Camden. EPA began demolition activities in November 2000, and completed the work in March 2001.

In March 2002, EPA started the second phase of the remedial action, which involved excavation and off-site disposal of radiologically contaminated soil in Study Area 3 in Gloucester City. EPA removed almost 47,000 cubic yards (about 70,000 tons) of radiologically contaminated soil from the Swim Club and nearby properties. In January 2004, EPA reassessed the cleanup strategy for these properties because the size and the scope of the cleanup exceeded the available remedial action funding. As a result, EPA was unable to complete the

cleanup on a portion of the Swim Club property in 2004. EPA plans to clean up the remaining waste on this property in the future when additional cleanup funds become available.

The third phase involved removal of contaminated soil in the backyards and alleyways along Arlington Street in Camden. The Arlington Street properties are adjacent to the former GGM facility. In January 2004, the New Jersey Housing Mortgage Finance Agency (as part of a redevelopment plan for the City of Camden) demolished the homes on Arlington Street. In May 2004, EPA started the cleanup of the radiological contamination in the area around Arlington Street. EPA completed this work in August 2004. This cleanup will pave the way for the City of Camden to redevelop the Arlington Street area. EPA plans to clean up the remaining subsurface soil contamination in the area around the former GGM facility in a future cleanup phase.

In October 2004, EPA started the fourth cleanup phase in Gloucester City, on a Study Area 6 property known as the "Popcorn Factory". EPA plans to complete this cleanup in fall 2005. After EPA completes the cleanup, the Gloucester City Board of Education plans on using this property for ball fields for a new middle school that will be built in the area.

## **SITE CHARACTERISTICS**

As noted earlier, EPA stated in the 1999 ROD that it would evaluate the potential radiological impact to the nearby surface water, sediment, and wetland areas. EPA's first step in this process was to identify the ecological characteristics of the area.

The Welsbach Site is located on the western edge of the Atlantic Coastal Plain in New Jersey in the Delaware River drainage basin. Drainage from the six Study Areas flows into the following water bodies: Newton Creek, its North and South Branches, Big Timber Creek, the Delaware River, and Martins Lake. The three forks of Newton Creek ultimately flow into the Delaware River. Martins Lake is an isolated water body located in Study Area 5.

Newton Creek and its South Branch generally flow west-northwest, and the Delaware River generally

flows south. These surface waters are tidal. The State of New Jersey classifies Newton Creek and the South Branch Newton Creek as “fresh water – non-trout” (FW2-NT). The State has also classified Martins Lake as FW2-NT. The FW2-NT water classification refers to fresh waters that are generally not suitable for trout because of their physical, chemical or biological characteristics, but are suitable for a wide variety of other fish species. Designated uses of FW2-NT waters include: maintenance, migration, and propagation of the natural and established plant and animal life; primary and secondary contact recreation; and industrial and agricultural water supply, and public potable water supply after treatment.

The State of New Jersey classifies the portion of the Delaware River adjacent to Study Area 2 as “Zone 3.” Designated uses for Zone 3 include agricultural, industrial and public water supply after treatment; maintenance of resident fish and other aquatic life; migration of fish; secondary contact recreation; and navigation.

#### Site Area Drainage

In Study Area 1, runoff water from rain events flows into the Delaware River through the municipal storm sewer system. In the basement of the former GGM building, there were underground drains that connected to the municipal storm sewer system.

In Study Area 2, runoff from the residential site properties and a portion of the former Welsbach property flows into the Delaware River through municipal storm sewers. The remainder of the overland runoff of water from the former Welsbach property is comprised of sheet flow (runoff that does not follow a defined channel) that flows directly into the Delaware River or Newton Creek.

In Study Area 3, runoff flows into Newton Creek through municipal storm sewers or as sheet flow.

In Study Area 4, runoff flows into either Newton Creek or the North Branch Newton Creek. The runoff from the residential site properties flows into the creeks through municipal storm sewers. Because the radiological contamination in this Study Area is located in very small isolated areas,

the water bodies adjacent to this Study Area were not included in the ecological assessment.

In Study Area 5, runoff flows into either the South Branch Newton Creek or Martins Lake. Runoff flows into Newton Creek either through municipal storm sewers or as sheet flow along the surface. A portion of the overland flow from Martins Lake Park empties into Martins Lake.

In Study Area 6, runoff flows into either the Delaware River or Big Timber Creek. Runoff from this Study Area flows into the water bodies either through storm sewers or as sheet flow.

#### **SURFACE WATER, SEDIMENT, AND WETLAND INVESTIGATION**

Following the ecological characterization, EPA investigated whether radiological contamination detected in the soils was present in the surface water, sediment, and wetland areas, in and adjacent to the Welsbach Site. Radionuclides in the uranium and thorium decay series are the primary contaminants detected in land portions of the Welsbach Site Study Areas. Overland runoff and/or the storm water collection systems present throughout the area could have transported these contaminants into the Delaware River, Newton Creek, and the other water bodies of concern.

In April and May 2001, EPA conducted a surface water, sediment, and wetland investigation in five of the six Study Areas at the Welsbach Site. The main objectives of this investigation were:

- To determine the presence or absence of radiological contamination in the bottom sediments of the water bodies where on-shore deposits of site-related radiologically contaminated materials were known or suspected.
- To prepare a screening level ecological risk assessment for the radiological and chemical contaminants of concern.
- To assess risk to human health and the environment from radionuclides in the surface water, sediment, and wetland areas.

- To provide sufficient data to make either a “no further action” recommendation or recommendations for further studies.

EPA conducted the investigation of surface waters, sediments and wetlands in Study Areas 1, 2, 3, 5, and 6 of the Welsbach Site. As previously discussed, EPA did not include Study Area 4 in this investigation because the soil contamination is in very small and isolated areas.

The investigation included collecting sediment samples and measuring the water quality in Newton Creek (Study Area 3), the South Branch Newton Creek (Study Area 5), Martins Lake (Study Area 5), and several storm water outfalls in South Branch Newton Creek and the Delaware River (Study Areas 1, 2, 3, 5 and 6). EPA collected 154 sediment samples and 82 water quality measurements. Both radiological and chemical data were collected. See Figure 1 for an overview map of the Study Areas.

EPA collected ten background sediment samples at locations upstream of the Welsbach Site in Newton Creek and South Branch Newton Creek, as well as in North Branch Newton Creek, Little Timber Creek and Miller’s Lake.

## INVESTIGATION RESULTS

For the radionuclides of potential concern, the radionuclide concentrations in the sediments were, on average, equal to levels found in uncontaminated areas in the vicinity of the Welsbach Site (background levels). The average radionuclide concentrations for thorium and radium in both the sediment and background samples were less than 1.2 picoCuries per gram (pCi/g).

At all of the sediment sampling locations, EPA detected non-radiological chemical constituents in the sediments that exceeded the maximum background concentrations and sediment screening guidelines. This information can be found in the Screening Level Ecological Risk Assessment (March 2002). In the area of the Welsbach Site, heavily developed industrial areas are located near the surface water bodies. These industrial areas are

### WHAT ARE THE POTENTIAL “CONTAMINANTS OF CONCERN”?

EPA has identified several contaminants in the sediments near the Welsbach Site. These contaminants fall into two categories, those related to the manufacturing process of the former Welsbach and General Gas Mantle facilities, and those most likely from other industries in the area.

The **Welsbach Site-related** contaminants of concern are part of the uranium and thorium decay chain, specifically radium-226, radium-228, thorium-230, and thorium-232. These radionuclides pose the greatest potential risk to human health and the environment at the Welsbach Site.

The **non-Welsbach Site-related** contaminants of potential concern found in the sediments include arsenic, lead, benzo(a)pyrene and other PAHs, pesticides such as 4,4’DDE, 4,4’-DDT and heptachlor epoxide, and PCBs. EPA also found elevated concentrations of these chemicals in the background samples.

In general, the area surrounding the Welsbach Site includes historic and current manufacturing facilities that used a variety of chemicals that were not in use or available when Welsbach made gas mantles. This supports EPA’s conclusion that the non-radiological chemicals are not related to the Welsbach Site.

potential sources of these non-Welsbach site-related chemicals found in the sediment.

NJDEP has issued a “do not eat” advisory for fish and shellfish from the Delaware River in the area of the Welsbach Site. This advisory is based on concentrations of mercury, dioxins, and polychlorinated biphenyls (PCBs) in fish. As part of a statewide program, NJDEP periodically collects samples of edible fish and shellfish in water bodies throughout the state. NJDEP found elevated levels of mercury, dioxins, and PCBs in its Delaware River samples.

## WHAT IS RISK AND HOW IS IT CALCULATED?

In a Superfund baseline human health risk assessment, EPA analyzes the potential adverse health effects caused by the release of hazardous substances, including radionuclides, from a site. The risk assessment assumes there will be no actions to control or mitigate the releases under current-and future-land uses. The risk assessment evaluates chemicals of concern that are both site related and non-site related. EPA bases its decisions under the Superfund program on the risk to human health and the environment from site-related contaminants.

EPA uses a four-step process in assessing site-related human health risks for reasonable maximum exposure scenarios.

**Hazard Identification:** In this step, the contaminants of concern at the site in various media (i.e., surface water, sediments, and wetlands) associated with the site are identified based on such factors as toxicity, frequency of occurrence, and fate and transport of the contaminants in the environment, concentrations of the contaminants in specific media, mobility, persistence, and bioaccumulation.

**Exposure Assessment:** In this step, the different exposure pathways through which people may be exposed to the contaminants identified in the previous step are evaluated. Examples of exposure pathways include incidental ingestion of and dermal contact with contaminated sediment, and ingestion of fish. Factors relating to the exposure assessment include, but are not limited to, the concentrations that people might be exposed to and the potential frequency and duration of exposure. Using these factors, a “reasonable maximum exposure” scenario, which portrays the highest level of human exposure that could reasonably be expected to occur, is calculated.

**Toxicity Assessment:** In this step, the types of adverse health effects associated with chemical and radiological exposures, and the relationship between magnitude of exposure (dose) and severity of adverse effects (response) are determined. Potential health effects are chemical and radionuclide specific and may include the risk of developing cancer over a lifetime or other non-cancer health effects.

**Risk Characterization:** This step summarizes and combines exposure information and toxicity assessments to provide a quantitative or qualitative assessment of site risks. Exposures are evaluated based on the potential risk of developing cancer and the potential for non-cancer health hazards. The likelihood of an individual developing cancer is expressed as a probability. For example, a  $10^{-4}$  cancer risk means a “one-in-ten-thousand excess cancer risk”; or one additional cancer may be seen in a population of 10,000 people as a result of exposure to site contaminants under the conditions explained in the Exposure Assessment. Current Superfund guidelines for acceptable exposures are an individual lifetime excess cancer risk in the range of  $10^{-4}$  to  $10^{-6}$  (corresponding to a one-in-ten-thousand to one-in-a-million excess cancer risk). For non-cancer health effects, a “hazard index” is calculated. An HI represents the sum of the individual exposure levels compared to their corresponding reference doses. The key concept for a non-cancer HI is that a “threshold level” (measured as an HI of less than 1) exists below which non-cancer health effects are not expected to occur.

The characterization also identifies risks associated with site related and non-site related contaminants. The characterization also considers uncertainties in the components of the assessment including the modeling.

## SUMMARY OF SITE RISKS

As part of the risk assessment process, EPA looks at the risks posed by a site to both human health and the environment. EPA’s risk assessment guidance calls for EPA to consider risk from all radiological and other chemical contaminants of potential concern regardless whether they are site related.

In the 1999 RI/FS, EPA assessed the potential risk to human health from the radiological contamination in soil at the Welsbach Site. The exposure pathways EPA considered were exposure to external gamma radiation and the inhalation and ingestion of radionuclides. The potential receptors of concern were workers, trespassers, and resident adults and children. EPA found that there was

unacceptable risk to human health for each of the potential receptors of concern for all of the exposure pathways.

In the 1999 ROD, EPA addressed these risks to human health by selecting a remedy to remove the radiologically contaminated soil and dispose of it at an off-site, licensed facility. The 1999 ROD also recommended that EPA evaluate potential risk to human health and the environment from radionuclides in surface water, sediment, and wetland areas at a later date.

EPA used sediment data from the surface water, sediment, and wetland investigation to evaluate the risk from radionuclides and chemicals of potential concern for both the baseline human health and screening level ecological risk assessments. The results of these risk assessments can be found in the Human Health Risk Assessment Addendum (January 2005) and the Screening Level Ecological Risk Assessment (March 2002).

## Human Health Risk

### *Exposure Assessment*

EPA conducted the baseline human health risk assessment and focused on the reasonably maximally exposed (RME) individual who would be spending time on or near the water bodies adjacent to the Welsbach Site. EPA used models to estimate the chemical concentrations in fish (animal tissue) based on the chemical concentrations in the sediments. EPA identified sediment and animal tissue as the primary environmental media of concern because sediment and animal tissue are or may become, in the future, readily available for human contact.

EPA evaluated the risks from exposure to the sediments. This analysis found that exposure to the sediments did not exceed EPA's cancer risk range. Surface water is also an environmental medium of concern. Because of dilution and other factors, the radiological and chemical concentrations in surface water would be much lower than in the sediments. As noted above, the risk from exposure to sediments did not exceed EPA's cancer risk range. Since the contaminant levels in the surface water would be even lower than those in the sediments, the risks from

exposure to surface water were not evaluated further.

EPA identified two categories of RME human receptors who might have exposure to contaminants of concern in the sediment, fish (based on modeled concentrations), and in the wetlands. The selection of receptors is explained in more detail in the Human Health Risk Assessment Addendum (January 2005). These receptors are:

- Recreationalists (adolescents 10 to 18 years old) who live near the water bodies and who may come into contact with sediment while wading or playing along the shorelines.
- Fishers (adolescents, adults, and children younger than six years of age) who may eat fish caught from the water bodies.

### *Risk Characterization - Radionuclides*

The radionuclides of potential concern for the Welsbach Site are the naturally occurring radionuclides in the thorium and uranium decay chains. To evaluate risk from these radionuclides, EPA first collects background radiological samples from areas that are not influenced by, or adjacent to, known or suspected areas of radiological contamination. At the Welsbach Site, EPA collected background radiological sediment samples at four locations. The average thorium and radium background concentrations ranged from 0.5 to 1.1 pCi/g. EPA then used these concentrations to estimate "background radiation" cancer risks. At the Welsbach Site, the highest cancer risk from "background radiation" was within the upper bounds of EPA's acceptable risk range of  $10^{-6}$  (1 in 1,000,000) to  $10^{-4}$  (1 in 10,000).

After determining the "background radiation" risks, EPA subtracted the background risks from the total risk from all sources. For both the Recreationalists and Fishers, EPA calculated the total cancer risks, minus the background risk, from radiological exposures in the Delaware River, Martin's Lake, and Newton Creek and its tributaries. These risks were also within the upper bounds of EPA's acceptable risk range of  $10^{-6}$  (1 in 1,000,000) to  $10^{-4}$  (1 in 10,000). The details of this

assessment are in the Human Health Risk Assessment Addendum.

#### *Risk Characterization – Chemical Contaminants*

EPA also evaluated the non-site-related chemicals of potential concern identified above. Because EPA did not take samples directly from fish, EPA used a model to calculate concentrations in fish based solely on sediment concentrations. This model may have over estimated the chemical concentrations in fish and the resulting calculated risks.

After evaluating the results of the model and the risk assessment, EPA found that PCBs are the main chemical contaminants that exceeded EPA's level of concern. Total PCB concentrations ranged from not detected to 14.4 milligrams per kilogram (mg/kg). However, PCBs are not associated with the operations at the former Welsbach and General Gas Mantle facilities. Because PCBs are not site related, EPA will not discuss the risks from PCBs further in this Proposed Plan. The details of EPA's analysis are included in the Human Health Risk Assessment Addendum.

#### Ecological Risk

Similar to the human health risk assessment, EPA uses a four-step process for assessing site-related ecological risks for a reasonable maximum exposure scenario:

- *Problem Formulation*—a qualitative evaluation of contaminant release, migration, and fate; identification of contaminants of concern, receptors, exposure pathways, and known ecological effects of the contaminants; and selection of endpoints for further study.
- *Exposure Assessment*—a quantitative evaluation of contaminant release, migration, and fate; characterization of exposure pathways and receptors; and measurement or estimation of exposure point concentrations.
- *Ecological Effects Assessment*—literature reviews, field studies, and toxicity tests,

linking contaminant concentrations to effects on ecological receptors.

- *Risk Characterization*— measurement or estimation of both current and future adverse effects.

The screening level ecological risk assessment focused on aquatic organisms, including fish, and did not evaluate the potential risk to higher-level organisms such as waterfowl, muskrats, and beavers. EPA considered fish as the potential receptors of concern for radionuclides because they have more potential for exposure to radionuclides in sediments than do semi-aquatic birds and mammals. They are also more sensitive to radiological damage than bottom-dwelling invertebrates.

#### *Radionuclide Ecological Assessment*

There are very few studies on ecological risk from radiological contaminants. Therefore, EPA compared the radionuclide concentrations found in the sediment samples at the Welsbach Site to multi-media benchmarks developed by the U.S. Department of Energy's (DOE's) Oak Ridge National Laboratory (ORNL). The adjusted benchmarks assume that the sediment and surface water concentrations are in equilibrium, and thus consider potential surface water exposure. These benchmarks are identified in DOE's 1998 document titled "Radiological Benchmarks for Screening Contaminants of Potential Concern for Effects on Aquatic Biota at Oak Ridge National Laboratory, Oak Ridge, Tennessee." Radiological levels above the benchmark or guideline values would indicate that sediments and surface water could cause harmful impacts to ecological receptors.

The results of this analysis indicate that the radionuclide concentrations in sediment and surface water are well below the DOE guideline levels. Furthermore, all of the sediment samples collected had radionuclide concentrations that were indistinguishable from the background radiation levels found in the area. Therefore, EPA has determined that radionuclides do not cause an unacceptable ecological risk at the Welsbach Site.

## *Chemical Ecological Assessment*

To evaluate the chemical risk to the environment, EPA also compared the chemical data from the sediments at the Welsbach Site to guidelines developed from various sources. These sources, including NJDEP guidance on sediment quality and other ecological toxicity thresholds, are identified in the Screening Level Ecological Risk Assessment.

For a number of chemical contaminants of potential concern, the concentrations in the sediments exceeded the ecological guideline levels. EPA found that the chemical constituents in the background sediment locations were similar to the samples collected from areas adjacent to the Welsbach Site. Therefore, the ecological risks from these chemical contaminants are not discussed further in this Proposed Plan

### Conclusion

The primary contaminants of concern for the Welsbach Site are radionuclides in the thorium and uranium decay chains. The results of EPA testing did not indicate elevated radionuclide concentrations in sediments adjacent to the Welsbach Site.

EPA's baseline human health risk assessment found that effects from exposures to the radionuclide concentrations in the sediments are within the upper bounds of EPA's acceptable risk range. This confirms that there are no adverse impacts to human health from the radionuclide levels in the sediments. In addition, the screening level ecological risk assessment results indicate that the radionuclide concentrations in the sediments are below EPA's level of concern.

Although the levels of some chemical contaminants of potential concern exceeded the ecological guidelines and human health risk levels, these chemical contaminants are not related to Welsbach and General Gas Mantle operations. Furthermore, ingestion of the PCBs in fish is the main contributor to the cancer risks and noncarcinogenic health hazard. Because PCBs in the sediments are unrelated to Welsbach or General Gas Mantle operations, EPA will not address these

chemical contaminants as part of the Welsbach Site remediation.

EPA is aware that the NJDEP has established fish consumption advisories to address the elevated levels of PCBs and other contaminants in fish from the Delaware River and its tributaries. EPA recommends that people fishing in the area follow the appropriate fish consumption advisories.

EPA has concluded that the radiological contamination from the Welsbach Site does not pose an unacceptable risk to human health and the environment. As a result, EPA recommends that no remedial action is necessary for the surface water, sediment, and wetland areas at the Welsbach Site.

### **SCOPE AND ROLE OF ACTION**

As with many Superfund sites, the problems at the Welsbach Site are complex. As a result, EPA has currently organized the work into four phases or operable units (OUs). This is the third of four planned OUs at the Welsbach Site. In the 1999 RI/FS, EPA assessed the risk from the Welsbach Site on human health. EPA addressed these risks in the 1999 ROD. This Proposed Plan addresses human and ecological risk to the environment from site-related contaminants in the surface water, sediment, and wetland areas.

The 1999 ROD selected a remedy for the first operable unit at the Welsbach Site. The remedy included demolition of the former General Gas Mantle building, excavation of the radiologically contaminated soil and debris at the residential, commercial, and industrial properties at the site and disposal of this material in a licensed, off-site facility.

In the future, EPA will address a remedy for the second operable unit, the former Welsbach facility's Armstrong Building. In September 1997, Holt Hauling and Warehousing, Inc. (Holt), the owner of the former Welsbach property at that time, entered into an Administrative Order on Consent (AOC) with EPA. Under the terms of the AOC, Holt agreed to perform an RI/FS on the Armstrong Building (one of the original Welsbach buildings). In November 1997, Holt started its RI of the Armstrong Building. In January 2000, Holt submitted the RI/FS Report for EPA review and

approval. In July 2000, EPA approved Holt's RI/FS Report. Holt's RI/FS identified sporadic radiological contamination on the structural surfaces inside the building. EPA will select a remedy for the Armstrong Building in the future based on information obtained from Holt's RI/FS.

The fourth planned operable unit at the Welsbach Site will address potential groundwater contamination.

### STATE/SUPPORT AGENCY ACCEPTANCE

The State of New Jersey agrees with the preferred No Action remedy described in this Proposed Plan.

### COMMUNITY PARTICIPATION

EPA and the State encourage the public to gain a better understanding of the Welsbach Site and the Superfund cleanup process. EPA and NJDEP provide information regarding the cleanup of the Welsbach Site to the public through public meetings, the Administrative Record file for the site, and announcements published in the local newspaper.

The front page of this Proposed Plan shows the dates for the public comment period, the date, location, and time of the public meeting, and the locations of the Administrative Record files.

EPA Region 2 has designated a point-of-contact for community concerns and questions about the Superfund program. To support this effort, the Agency has established a 24-hour, toll-free number the public can call to request information, express concerns or register complaints about Superfund. The Public Liaison Manager for EPA's Region 2 office is:

George H. Zachos  
Toll-free (888) 283-7626  
(732) 321-6621

U.S. EPA Region 2  
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**For further information on the Welsbach/General Gas Mantle site, please contact:**

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Figure 1- Site Map

