METHOD 3 HUMAN HEALTH RISK ASSESSMENT – MASHAPAUG COVE

333 ADELAIDE AVENUE PROVIDENC, RHODE ISLAND

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1.0 INTRODUCTION

1.1 PURPOSE

This document presents the Method 3 Risk Assessment for Mashapaug Cove that is within the boundaries of the property at 333 Adelaide Avenue, Providence, Rhode Island. Figure 1 is a map of the Property at 333 Adelaide Avenue, which also identifies Mashapaug Cove. As part of the redevelopment of the property at 333 Adelaide Avenue, the following distinct areas have been identified: the area that has been redeveloped for retail use (Parcel A); the area of the new high school that is currently under construction (Parcel B), the area of the planned YMCA facilities including office space, recreational, and after-school day-care facilities that will soon to be constructed (a portion of Parcel C); and the remaining portion of Parcel C and all of Parcel D (referred to as the Park Parcel in the March 29, 2006 Consent Order, and Mashapaug Cove is that portion of Mashapaug Pond that is within the 333 Adelaide Avenue property boundary. This risk assessment has been prepared as an appendix to the July 2006 Supplemental Site Investigation Report (SIR) for Parcel D, the portion of parcel C that is not part of the YMCA redevelopment, and Mashapaug Cove. The focus of this Method 3 Risk Assessment is the potential risks associated with Mashapaug Cove as required by the Amended Letter of Responsibility issued by RIDEM on April 5, 2006 (RIDEM, 2006a).

This Method 3 risk assessment addresses surface water and sediment and it complements the Method 1 remedial objectives identified in the Supplemental SIR for the soils in the upland portions of Parcel D and the portion of Parcel C that is not being redeveloped by the YMCA. The Site Investigation Report utilizes the results of this Method 3 risk assessment in conjunction with the Method 1 remedial objectives for the soils that are identified in the Supplemental SIR.

1.2 RISK ASSESSMENT PROCESS

The risk assessment process can be divided into four steps: hazard identification, dose-response assessment, exposure assessment, and risk characterization and uncertainty analysis. The **hazard identification** determines what substances at the Site may be of potential concern. The **toxicity assessment** identifies the potential adverse effects that might be associated with exposure to substances at the Site and also describes the relationship between the level of exposure and the likelihood and/or severity of an adverse effect (dose-response assessment). The **exposure assessment** identifies potential routes of exposure, characterizes the populations exposed, and determines the frequency, duration, and extent of exposure. The last step, **risk characterization**,

combines the information from the previous three steps to describe the type (e.g., carcinogenic and non-carcinogenic) and magnitude of potential risks to the exposed populations. It also identifies the uncertainty in the characterization of potential risks.

1.3 ASSUMPTIONS AND REGULATORY CONTEXT

The August 2, 2005 Letter of Responsibility from RIDEM to Textron, Inc. required investigation of Mashapaug Cove in a manner consistent with the Rhode Island Remediation Regulations. That letter was the focus of a meeting on September 28, 2005 at RIDEM's offices attended by representatives of the City of Providence, Textron Inc., RIDEM, and Rhode Island Department of health (RIDOH). Subsequent to that meeting, Textron submitted to RIDEM the November 2005 *Supplemental Site Investigation Work Plan to Support Human Health and Ecological Risk Assessment Activities, Park Parcel/Mashapaug Cove, Former Gorham Manufacturing Property, 333 Adelaide Avenue, Providence, Rhode Island*. On March 14, 2006 RIDEM forwarded a letter to Textron in response to the November 2005 Work Plan.

On March 29, 2006 two Consent Orders were executed with respect to the property at 333 Adelaide Avenue. The Consent Orders addressed "Parcels B & C" and the "Park Parcel" respectively. The Consent Order for "Parcels B & C" primarily addressed concerns related to the construction of a new high school by the City of Providence and new YMCA facilities to be constructed on land owned by the City of Providence. The Consent Order for the "Park Parcel" addresses concerns related to the remaining portions of the 333 Adelaide Avenue property (excluding the area already developed for retail use, the area of the high school, and the area of the proposed YMCA facilities). That Consent Order required the preparation of the SIR to which this risk assessment is attached.

On April 5, 2006 RIDEM issued an Amended Letter of Responsibility to Textron and the City of Providence with respect to the Park Parcel. That letter amended the requirements for the preparation of an SIR to include Mashapaug Cove. On May 2, 2006 a meeting was held between representatives of RIDEM and Textron to discuss Textron's conceptual approach for the investigation of the uplands area and Mashapaug Cove. On May 25, 2006 RIDEM provided a letter response to the conceptual approach for sampling and analysis of the uplands area and Mashapaug Cove. Textron completed a Supplemental Site Investigation Work Plan in June 2006 and the activities identified in the Work plan were implemented in June and July of 2006. The

human health risk assessment has considered all of the available analytical data for Mashapaug Cove.

The risk assessment includes the assessment of human health risk at the Site subject to the requirements of the Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases (hereafter referred to as the Remediation Regulations) dated March 31, 1993 and as amended in August 1996 and February 2004 (RIDEM, 2004). The human health risk characterization has considered the analytical data that were collected during the Phase I and Phase II site investigations, pre-design investigations, and supplemental investigations, including those investigations conducted by RIDEM in 2005 and by MACTEC in behalf of Textron in 2006. The risk characterization has been performed in accordance with Rule 8.04 of the Remediation Regulations. As required by Rule 8.04, the methodology used here is consistent with scientifically acceptable risk assessment practices and the fundamentals of risk assessment under EPA's Risk Assessment Guidance for Superfund. Supplemental guidance for this risk assessment was provided by the "Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part A), Interim Final" (USEPA, 1989), the "Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part D, Standardized Planning, Reporting, and Review of Superfund Risk Assessments)" (USEPA, 1998), the "Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors" (USEPA, 1991), and USEPA Region I guidance (USEPA Region I, 1995a and 1996a), and the Exposure Factors Handbook (USEPA, 1997b).

It has been proposed in the SIR that portions of the shoreline and upland areas to the south and east of Mashapaug Cove will be capped to bring those areas into compliance with Industrial/Commercial Direct Exposure Criteria. Consistent with the March 29, 2006 Consent Order (Park Parcel), the final land use for Parcel D and the portion of parcel C not included in the YMCA redevelopment is Industrial/Commercial. Therefore the upland areas adjacent to Mashapaug Cove are considered to have potential future use as Industrial/Commercial property. An eight foot high chain link fence currently separates Parcel D, that portion of Parcel C that is not included in the YMCA redevelopment, and Mashapaug Cove from Parcel A, Parcel B, and the portion of Parcel C included in the YMCA redevelopment. An ELUR as described in Section 8.09 of the Remediation Regulations will be instituted for the Site to prohibit residential and recreational use and other sensitive uses/activities on Parcel D and the portion of Parcel C that is not included in the YMCA redevelopment. In addition, signs will be posted along the existing fence line installed by the City of

Providence to prohibit digging and disturbance of the cap. The ELUR will include specific measures for the preservation of the cap through the implementation of an Operation and Maintenance Plan and will restrict activities on the various surfaces of the cap to those that are consistent with cap construction.

1.4 HISTORY OF THE PROPERTY AND SITE

The history of the 333 Adelaide Avenue property that borders the cove to the east, south, and west is well documented and is summarized in Sections 1.0 and 2.0 of the SIR. The detailed summary is not reproduced here, but can be found in the SIR. The former Gorham Manufacturing Facility at 333 Adelaide Avenue is situated on a 37 acre parcel adjacent to at 333 Adelaide Avenue in Providence, Rhode Island. Between 1890 and 1986, sterling silver and plated silverware, as well as bronze castings, were manufactured on-site. Operations including casting, rolling, polishing, lacquering, forging, plating, annealing, soldering, degreasing, machining, and melting.

The former manufacturing facility has been improved with a retail complex on Parcel A, a high school is under construction on Parcel B, and the Greater Providence YMCA is planning to construct a facility on a portion of Parcel C. Parcel D is currently vacant and surrounded by a chain link fence. The currently vacant former carriage house (garage), located in the northeast portion of Parcel C is the only remaining building from the former facility. The former manufacturing site is bordered by a parking lot and supermarket to the east and Adelaide Avenue and a residential neighborhood to the south. The 333 Adelaide Avenue property site slopes downward toward Mashapaug Pond and Mashapaug Cove and Mashapaug Pond. Figure 2 shows the location of Mashapaug Cove.

The 2006 Amended Notice of Responsibility requires an assessment of Mashapaug Cove. Mashapaug Cove has an area slightly larger than four acres and is within the property line of 333 Adelaide Avenue as shown on Figure 2. The southern half of Mashapaug Cove is herein referred to as the Inner Cove and the northern half up to the property line referred to as the Outer Cove. Recent investigations have focused on approximately 10 acre area, including Mashapaug Cove. Mashapaug Cove (i.e. the "Cove") is located in the northeast corner of Mashapaug Pond.

1.5 PHYSICAL DESCRIPTION OF MASHAPAUG COVE AND SURROUNDING AREA

Mashapaug Cove has surface area slightly greater than four acres. Mashapaug Cove is bordered to the east, south, and west by portions of the property at 333 Adelaide Avenue. Mashapaug

Cove is bordered to the north by Mashapaug Pond and on the opposite shore of Mashapaug Pond is an industrially-zoned area. Water depth within the Inner Cove as measured in June 2006 had a maximum of 3.5 feet and the maximum water depth in the Outer Cove was 11.4 feet at its northern perimeter. Overall, the Inner Cove has an organic, silty bottom that might be described in common terms as "muck". The eastern shoreline of the Outer Cove generally has a more sandy, less silty bottom and is more accessible than is the shoreline along most of the Inner Cove. The deeper portion of the Outer Cove appears to also exhibit a somewhat organic, silty bottom. During the summer months, aquatic vegetation is very abundant within the Inner Cove.

Mashapaug Pond (including Mashapaug Cove) has been classified as Class B surface water (RIDEM, 2006). Class B waters are designated for fish and wildlife habitat and primary and secondary contact recreational activities. They should be suitable for compatible industrial process and cooling, hydropower, aqua-cultural uses, navigation, and irrigation and other agricultural uses. These waters should have good aesthetic value.

In August 2002, RIDEM and the Rhode Island Department of Health (RIDOH) issued a letter (RIDEM and RIDOH, 2002a) to inform the public concerning water quality in Mashapaug Pond and to identify safe uses of the pond. That letter concluded that fish caught from the pond are not safe to eat due to contamination by PCBs and dioxins, that bacteria levels are apparently high following rainstorms rendering the pond unsafe for swimming, and blue-green algae found in the pond can produce toxins that can harm humans and animals that swim in or drink pond water during algal blooms, further rendering the pond unsafe for direct contact and consumption at those times. None of these conditions has been attributed to conditions at the Site itself or the former manufacturing facility.

A "Do's and Don'ts Flyer" was released by RIDEM and RIDOH (RIDEM and RIDOH, 2002b) that indicates that catch and release fishing and boating are safe activities for Mashapaug Pond. The flyer strongly urges people not to drink pond water, not to eat fish caught in the pond, not to swim, wade, play, or bathe in pond water, and not to boat whenever thick scum, algal mats, or foul odors occur on the pond. A copy of the RIDEM/RIDOH advisory letter and flyer is presented in Appendix B of the SIR. This advisory concerning safe uses of the pond indicates that a visitor to the Site should be unlikely to have significant exposures to Site-related constituents during recreational activities at the pond (minimal exposure to cove surface water

and sediment). However, historically, the RIDEM/RIDOH advisory has not been completely effective in preventing direct contact recreational uses of the cove such as wading and swimming.

Groundwater beneath the Site is classified by RIDEM as Class GB, not suitable for public or private drinking water use. Groundwater beneath or near the Site is not used as a source of drinking water. There are no public or private wells within a four-mile radius of the Site (ABB-ES 1995a and 1995b). The nearest public water supply is the Scituate Reservoir located approximately nine miles to the west, which is the source of public drinking water for the City of Providence.

Groundwater beneath the former facility flows predominantly in a northerly direction and discharges into Mashapaug Cove. There is a groundwater divide approximately parallel to the eastern property boundary, in the southeastern portion of the property. The depth to groundwater beneath the 333 Adelaide Avenue property ranges from approximately 3-feet along the north bank area (south shore of Mashapaug Cove) to 30-feet below grade in the southeastern area of the 333 Adelaide Avenue property. Historical investigations have identified low levels of volatile organic compounds (VOCs) (PCE, TCE and 1,1,1-TCA) in groundwater immediately upgradient of Mashapaug Cove along the southern shore. This VOC groundwater plume has previously been determined to pose minimal impact to surface water within the Cove (Section 3.5; HLA, 1999).

1.6 CONCEPTUAL SITE MODEL

The conceptual site model (CSM) identifies the nature and sources of releases, migration mechanisms, receiving media, potential receptors, and potential exposure pathways. The CSM information is used in scoping the risk assessment activities and in the identification of remedial objectives. The following text describes the CSM for the evaluation of the Park Parcel soils and the surface water and sediment of Mashapaug Cove. Figure 4.41 is a summary of the CSM. Many of the sources at the former facility have been addressed through remedial actions and may no longer represent a source from which hazardous materials could migrate. The 2005 RIDEM investigation of the Site as well as the Supplemental SI have identified materials (dioxins and furans in particular) in soil and sediments that had not previously been identified at the former manufacturing facility. The specific source of the dioxins and furans is not known. However, the distribution of dioxin and furan homolog groups in soil and sediment appears to be consistent with the signature associated with municipal waste incineration.

The northeastern portion of the Site is not known to have been the location of former manufacturing or waste disposal activities. The specific source of the arsenic and PAHs that have been identified in soil in portions of that area is not known. It appears that imported fill or fill from the former manufacturing facility is present beneath the pavement on the former parking area in the northeast portion of the Park Parcel. It also appears that fill materials have been brought to that area and then placed on top of the existing pavement from the former parking area. The source of that material has not been identified.

1.6.1 Sources

Investigations of the former Gorham Manufacturing Facility and the remainder of the property at 333 Adelaide Avenue have identified evidence of releases of hazardous materials associated with the former facilities to soils and groundwater. The 1995 RI Report indicated that six categories of release, or potential release had been identified. These include: oil from removed and out-of-service USTs; VOCs in soil and groundwater from above-ground storage tanks (ASTs), production activities (particularly in the areas of Buildings W and T), or incidental disposal; fill material of the West Parking and North Bank Areas; surface soils containing PCBs near the transformer pad and Building N; releases of oil from machines to building basements; and possible contaminants conveyed from the site in stormwater runoff. Subsequent to the RI Report, an additional source has been identified. A slag pile located immediately south of Mashapaug Cove appears to have been accumulated from smelter operations that were performed in Building V of the former facility. The slag pile consisted of very dense, metals-containing, solid material that was present in chunks ranging in diameter between an inch or two to perhaps nine or ten inches. The slag pile has been excavated and removed from the property in July 2006.

In particular, the bronze casting, silverware manufacturing, and plating activities have resulted in releases of metals (in particular lead and copper) to soils on Parcels A, B, and C. In addition, a slag pile located immediately south of Mashapaug Cove appears to have been accumulated from smelter operations that were performed in Building V of the former facility. Chlorinated VOCs have been detected in groundwater in the areas of former Buildings W and T. The Building W area is a probable source area for PCE in groundwater. However, the specific source or point of release of PCE in the vadose zone soil nor in the shallow groundwater has not been identified. Remedial activities including excavation and treatment of petroleum residuals in the former facility area have been conducted.

1.6.2 Migration Pathways and Receiving Media

Investigations to date indicate that metals and PAHs and other persistent materials in surficial soils and fill material have the potential to migrate with soil material via overland flow during and immediately after precipitation events. It appears that historically, and recently, soils from the former facility area and along the filled area immediately to the south of Mashapaug Cove have been subjected to this mechanism and a number of drainage swales have been identified between the higher elevation former facility area and the shoreline of Mashapaug Cove. Potentially, release of metals from the former slag pile might have occurred via infiltration of precipitation and subsequent leaching of metals. The leachate may have infiltrated into groundwater and subsequently flowed to surface water or it may have flowed directly into the cove from the slag pile.

Persistent and bioaccumulating substances that are present in sediments have the potential to accumulate in biota and be biomagnified via food chain (both human and ecological) mechanisms. There are few persistent and bioaccumulating substances detected in sediments that may need to be evaluated for this type of migration/exposure pathway. USEPA identified a list of priority persistent and bioaccumulating substances. The list includes aldrin/dieldrin; benzo(a)pyrene; chlordane; DDT, DDD, DDE; hexachlorobenzene; alkyl-lead; mercury; mirex; octachlorostyrene; PCBs; dioxins and furans; and toxaphene. From that list of compounds, only benzo(a)pyrene and dioxins and furans have been reported in sediments frequently and at concentrations that are indicative of a release. Potential bioaccumulation of these substances into biota from the pond and into humans or non-human predators is a possibility.

There is an identified plume of chlorinated VOCs in groundwater which flows in a northerly direction from the higher elevation former facility area in the direction of Mashapaug Cove. The groundwater appears to discharge into Mashapaug Cove, passing through the sediments of the cove in the process. Available data indicate that minimal transfer of chlorinated VOCs from groundwater to surface water is occurring. The available sediment quality data suggest that the highly organic sediments of the cove may be acting as a sink for VOCs in groundwater that passes through the sediment. This has not been confirmed, and direct historical discharge of VOC-containing materials to the cove has also not been ruled out as a possible explanation of sediment quality.

There are currently no occupied buildings within the Park Parcel and therefore there is no current or potential migration pathway involving vapor migration from groundwater to indoor air. There have

not been highly leachable materials identified in soils within the Site that might migrate to groundwater via leaching or infiltration.

1.6.3 Potentially Complete Exposure Pathways

A complete exposure pathway requires four elements: 1) a source or mechanism of chemical release; 2) a transport or retention medium; 3) a point of potential human contact with the contaminated medium; and 4) a route of exposure at the point of contact (USEPA, 1989). Potential exposure pathways were determined by first identifying all sources of contamination and the receiving media. Once sources were identified, relevant fate and transport mechanisms were evaluated to identify potential exposure media. Exposure points and exposure routes were then identified by determining the areas where receptors may potentially come in contact with contaminated media (i.e., the exposure points), and the likely mechanisms of exposure (i.e., exposure routes). Exposure pathways that have these four elements (i.e., a source or mechanism of release, a transport or retention medium, an exposure point where contact can occur, and an exposure route at the point of contact) are considered potentially complete pathways (USEPA, 1989).

The CSM indicates that inorganics and metals, SVOCs, and dioxins and furans are present in soils of the Park Parcel. Under the industrial/commercial land use (identified final use of the Site), an employee could potentially be exposed to surface soil. Utility or construction work could also occur under the industrial/commercial land use, thereby potentially exposing utility or construction workers to soil. Potential exposure pathways to the constituents detected in soil could include incidental soil ingestion, dermal contact, and inhalation of soil-derived dust and vapors.

Trespassers could potentially be exposed to soils at the site. Trespassers at the Site could include adults, adolescents and children, although children under the age of 8 are unlikely to be trespassing on this property. Potential exposure pathways to the constituents detected in soil could include incidental soil ingestion, dermal contact, and inhalation of soil-derived dust.

The groundwater at and downgradient of the Site is not used as a source of potable water, and there are no private water supply wells within ½ mile of the site. Potable water is supplied by the City of Providence municipal supply system. Therefore, there are no complete exposure

pathways associated with potable or non-potable use of groundwater (either residential or industrial/commercial).

It appears groundwater discharges to Mashapaug Cove. VOCs, particularly chlorinated solvent compounds, are present at very low concentrations in surface water but appear to be present in sediment at several locations within Mashapaug Cove. The cove sediments also contain inorganics and metals, PAHs, and dioxins and furans. Industrial workers might be exposed to constituents in surface water and sediment (covered by two feet of water or less) during infrequent wading activities within the cove. Trespassers might be exposed to constituents in surface water and sediments that are covered by surface water two feet or less in depth during wading and/or swimming activities. Environmental receptors (aquatic life, wildlife, birds) might be exposed to constituents in surface water and sediment.

Biota in the cove may have accumulated benzo(a)pyrene and dioxins and furans tissues. Humans who might catch and consume biota (such as fish or turtles) could potentially be exposed to these constituents. It should be noted there is a RIDEM/RIDOH advisory in place that advises people not to consume fish from Mashapaug Pond because of PCBs and dioxins reported in fish tissue. Biota in the cove might be exposed directly by accumulating the constituents in tissues, or predators (such as fish, predatory fish and birds, and semi-aquatic wildlife) may be exposure via consumption of prey.

In summary, the following potentially complete exposure pathways have been identified for the Site:

1) Industrial/commercial employee:
    a. potential direct contact with soil/incidental ingestion, dermal contact, and inhalation of dust; and
    b. potential incidental ingestion and dermal contact with surface water and sediment in Mashapaug Cove.

2) Construction and utility workers:
    a. potential direct contact with soil/incidental ingestion, dermal contact, and inhalation of dust and vapor inhalation.

3) Adolescent and adult trespasser:
    a. potential direct contact with soil/incidental ingestion, dermal contact, and inhalation of dust;
    b. potential incidental ingestion and dermal contact with surface water and sediment in Mashapaug Cove during wading/swimming activities; and
    c. potential consumption of fish or other biota obtained from Mashapaug Cove.

1.7 SELECTION OF METHOD FOR CONDUCTING THIS RISK ASSESSMENT

Three soil risk assessment methods associated with remedial objectives are described in RIDEM's Remediation Regulations (RIDEM, 1993 and updated in 1996 and 2004). Method 1 risk assessments involve comparisons of soil concentrations to direct exposure criterion and leachability criteria. Method 2 risk assessments evaluate potential risks using site-specific information for individual chemicals, possibly in conjunction with Method 1 values for other chemicals. Both Methods 1 and 2 are chemical-specific assessment/management approaches. Method 3 risk assessments evaluate the cumulative cancer and non-cancer risks associated with possible exposures at a site. The Method 3 approach is a cumulative risk approach rather than a chemical-specific approach. Method 3 has been selected as the method to evaluate potential human health risk at the site. This is appropriate because there are no Method 1 or Method 2 direct exposure criteria for surface water and sediment.

2.0 HAZARD IDENTIFICATION

2.1 IDENTIFICATION OF AVAILABLE DATA AND SELECTION OF ANALYTICAL DATA FOR THE RISK ASSESSMENT

Sections 3 and 4 of the SIR discussed the data collection and evaluation activities. Appendix A presents all of the analytical data used in the risk assessment.

For surface water, the HHRA uses only the samples collected in June 2006 by MACTEC to evaluate the risk from surface water. There are some historical surface water samples which were collected by URI, RIDEM and HLA, of which the most recent sampling was preformed in 1999. It is assumed that the recent data will better represent the current conditions of the cove. Table 1 presents a summary of detected compounds in surface water.

For sediment, the HHRA uses samples collected in June, 2006 by MACTEC and samples collected in December, 2005 by RIDEM. The sediment samples collected by MACTEC were collected at locations SED10 through SED32. Multiple depth intervals were sampled during this event but only the 0 – 1 foot interval will be used in this HHRA. The sediment samples collected by RIDEM were collected at locations SD-1001 to SD-1005 at an interval of 0-2 feet. Table 2 presents a summary of detected compounds in sediment.

2.1.1 Dioxin

In this report the term dioxin is used to refer to both dioxin congeners (dioxins or polychlorinated dibenzo dioxins (PCDDs)) and furan congeners (furans or polychlorinated dibenzo furans (CDFs)), a group of related compounds with similar risk characteristics. The congener-specific dioxin and furan concentration data have been consolidated into a simple measure for each of the samples that have been analyzed. That single measure is referred to as the Toxic Equivalence (or TEQ) of the sample. The TEQs are media-specific concentrations that are normalized to the toxicity of the 2,3,7,8-TCDD congener, generally considered to be the most toxic of the dioxin, furan, and dioxin-like compounds. The TEQs are calculated by multiplying the medium-specific concentration of each congener or congener group by a Toxicity Equivalence Factor (TEF) and summing those products. The TEF is a measure of the toxicity of a particular congener or congener group relative to toxicity of 2,3,7,8-TCDD. The human health risk assessment process typically utilizes the mammalian TEFs published by the World Health Organization listed in Table 3. In simple terms, the dioxins/furans TEQ indicates the concentration of 2,3,7,8-TCDD

that would have the same toxicity as the mixture of dioxins and furans being evaluated. Congeners that do not contain chlorine at the 2,3,7, and 8 positions are not assigned a TEF, since they do not have the same chemistry as the 2,3,7,8-TCDD congener.

Calculations for dioxin TEQ values in surface water and sediment are presented in Tables 4 and 5 respectively.

2.2 SELECTION OF CHEMICALS OF POTENTIAL CONCERN (COPCS)

This section identifies the chemicals present at the Site and provides rationale for inclusion of analytes as COPCs.

2.3 COPC SELECTION METHODS

COPCs are chemicals for which data of sufficient quality are available, and which may pose more than a *de minimus* health risk. The procedure used to select COPCs for the HHRA is summarized as follows, and is consistent with USEPA Region I (USEPA, 1999) methodology:

1) *Comparison to Available Criteria*
   - Selected as a COPC in **sediments** if the maximum detected concentration exceeds the USEPA Region IX PRG for residential soils (USEPA, 2004).
   - Selected as a COPC in **surface water** if the maximum detected concentration exceeds the USEPA Region IX PRG for tap water (USEPA, USEPA, 2004).

The soil PRGs are protective for direct contact (ingestion and dermal contact) exposures, as well as for inhalation of particulate and volatile constituents that may be released to air. The PRGs are derived for a $1x10^{-6}$ cancer risk level or a non-cancer hazard quotient (HQ) of 1. Per USEPA Region I guidance (USEPA, 1995), the PRGs based on noncarcinogenic effects have been adjusted to represent a HQ of 0.1 for the purposes of COPC selection. This adjustment of the PRGs per the guidance is applied to account for the possible cumulative impacts of having several chemicals that might have similar mechanisms of toxic action.

The use of residential PRGs for selection of COPCs in sediment ensures that analytes present at concentrations that could potentially pose more than a *de minimus* risk for residential land use exposures are identified. The use of these PRGs for selection of COPCs in and sediments represents a conservative approach, since potential exposures to these media will not occur at the frequency or intensity that would be associated with residential land use. The use of tap water PRGs to identify COPCs in surface water represents a very conservative approach, since potential

exposures to surface water would involve only incidental ingestion of water (Mashapaug Pond is not used as a source of potable water).

The results of the COPC selection for each medium are summarized in Tables 6 through 7. The following notes are used to denote the reasons for selection or exclusion of analytes as COPCs:

A. ASL: The concentration used for COPC screening (the maximum detected concentration) is greater than the risk-based concentration; the analyte is therefore selected as a COPC.

B. BSL: The concentration used for COPC screening (the maximum detected concentration) is less than the risk-based concentration; the analyte is therefore not selected as a COPC.

C. NSL: The chemical does not have an available risk-based concentration and therefore is selected as a COPC.

D. FOD: The concentration used for COPC screening (the maximum detected concentration) is greater than the risk-based concentrations; however the chemical is detected in less than five percent of the samples and at low concentrations, therefore the analyte is not selected as a COPC.

2.3.1 COPC Selection Results

COPCs have been selected for both exposure areas combined (inner cove and outer cove) for each medium. In surface water the following chemicals were selected as COPCs because their maximum detected concentration is greater than their corresponding screening value: cis-1,2-dichloroethene, tetrachloroethene, trichloroethene, vinyl chloride, benzo(a)anthracene, benzo(a)pyrene, dibenz(a,h)anthracene, and dioxin (TEQ). Also in surface water lead is selected as a COPC because there was no screening value available. The selection of COPCs for surface water is presented in Table 6.

In sediment the following chemicals have been selected as COPCs because their maximum detected concentration is greater than their corresponding screening value: cis-1,2-dichloroethene, tetrachloroethene, trichloroethene, vinyl chloride, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene, aroclor-1254, arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and dioxin (TEQ). Also in sediment s-butylbenzene is selected as a COPC because there was no screening value available. The selection of COPCs for sediment is presented in Table 7.

3.0 TOXICITY ASSESSMENT

3.1 TOXICITY ASSESSMENT

The purpose of the toxicity assessment is to characterize the relationship between the dose of COPC administered or received and the incidence of adverse health effects in the exposed population. From this quantitative dose-response relationship, toxicity values (e.g., slope factors, reference dose values, or reference concentrations) are derived that can be used to estimate the likelihood of adverse effects as a function of human exposure to an agent. These toxicity values are used in the risk characterization process to estimate the potential for adverse effects occurring in humans at different exposure levels.

The dose-response relationship(s) for each chemical that has been selected as a COPC is presented in this section. The dose-response information may be divided into two major categories:

- Toxicity information associated with threshold (non-carcinogenic) health effects.
- Toxicity information concerning carcinogenicity, either from human epidemiologic data or from laboratory studies.

All the chemicals selected as COPCs are evaluated for potential *non-carcinogenic* health effects. In addition, any substance considered to be a *known*, *probable*, or *possible* human carcinogen is also evaluated for its potential carcinogenic effects. The classification of a chemical as a carcinogen does not preclude an evaluation of that same chemical for potential non-carcinogenic health risks, as all potentially carcinogenic chemicals may also exert non-carcinogenic health effects.

3.1.1 Dose-Response Assessment for Carcinogenic Effects

It has generally been assumed that carcinogenic effects are non-threshold effects (IRIS, 2003). This means that any dose, no matter how small, is assumed to pose a finite probability of generating a response. Thus, no dose of a carcinogen is thought to be risk-free. For carcinogenic effects, USEPA uses a two-part evaluation in which the substance is first assigned a weight-of-evidence classification, and then a slope factor (SF) or unit risk (UR) is calculated to reflect the carcinogenic potency.

The weight-of-evidence evaluation involves determining the likelihood that the agent is a human carcinogen. USEPA has developed a system for characterizing the overall weight of evidence for a chemical's carcinogenicity based on the availability of animal, human, and other supportive data (USEPA, 1989a). The weight-of-evidence classification rates the likelihood that an agent is a human carcinogen. It qualitatively affects the interpretation of potential health risks. Three major factors are considered in characterizing the overall weight-of-evidence for carcinogenicity: (1) the quality of evidence from human studies, (2) the quality of evidence from animal studies, and (3) other supportive information, such as mutagenicity data and structure-activity data.

The USEPA final classification of the overall weight-of-evidence has the following five categories; these categories will be redefined when USEPA adopts the Final Guidelines for Carcinogen Risk Assessment:

Group A - Human Carcinogen. This category indicates there is sufficient evidence from epidemiological studies to support a causal association between an agent and human cancer.

Group B - Probable Human Carcinogen. This category generally indicates there is at least limited evidence from epidemiologic studies of carcinogenicity to humans (Group B1) or that, in the absence of data on humans, there is sufficient evidence of carcinogenicity in animals (Group B2).

Group C - Possible Human Carcinogen. This category indicates that there is limited evidence of carcinogenicity in animals in the absence of data on humans.

Group D - Not Classified. This category indicates that the evidence for carcinogenicity in animals is inadequate.

Group E - No Evidence of Carcinogenicity to Humans. This category indicates that there is evidence of noncarcinogenicity in at least two adequate animal tests in different species or in both epidemiologic and animal studies.

USEPA's draft revised guidelines for cancer risk assessment (USEPA, 1999) have been adopted as agency policy for cancer risk assessment. These guidelines contain a revised classification system for carcinogenic effects with the following classifications.

- Carcinogenic to humans
- Likely to be carcinogenic to humans
- Suggestive evidence of carcinogenicity, but not sufficient to assess human carcinogenic potential
- Data inadequate for an assessment of human carcinogenic potential
- Not likely to be carcinogenic in humans

In IRIS, the weight of evidence classification for a given chemical may reflect either of the two classification schemes identified above.

CSF values are typically calculated for chemicals in Groups A, B1, B2, and "Carcinogenic to humans" and "Likely to be carcinogenic to humans". Cancer dose-response values for chemicals in Group C are calculated on a case-by-case basis. The CSF is an estimate of the upper 95% Confidence Limit of the slope of the dose-response curve extrapolated to low doses.

For some chemicals, human epidemiologic data are the basis of an estimate of the carcinogenic potency, although the most common basis of these values is an animal study. The CSF is given in units of $(mg/kg/day)^{-1}$ and is based upon the concept of a lifetime average daily dose. Oral CSFs are used to estimate the risks associated with exposure to carcinogens via ingestion. No SFs are available for the dermal route of exposure, but are instead calculated from oral SFs using the methodology described in Section 3.1.3.

The dose-response data used in this HHRA for carcinogenic effects are presented in Appendix B.

3.1.2 Dose-Response Assessment for Noncarcinogenic Effects

In contrast to carcinogens, noncarcinogens are believed to have threshold exposure levels below which adverse effects are not expected. USEPA has derived standards and guidelines based on acceptable levels of exposure for such compounds. Noncarcinogenic effects of concern on which many of the standards and guidelines are based include liver toxicity, reproductive effects, neurotoxicity, teratogenicity, and other chronic toxicities. Various criteria have been developed from experiments that can be used to estimate the dose-response relationship of noncarcinogens. Some of the same uncertainties involved in deriving cancer risk estimates (namely, selection of an appropriate data set and extrapolation of high-dose animal data to low-dose human exposure) are also involved in deriving noncarcinogenic dose-response criteria. Dose-response values used most often to evaluate noncarcinogenic effects are reference doses (RfDs).

The RfD, expressed in units of mg/kg/day, is defined as an estimate (with uncertainty spanning perhaps an order of magnitude or greater) of a daily exposure level for the human population, including sensitive subpopulations, that is likely to be without an appreciable risk of deleterious effects during a lifetime (USEPA, 1989). When available, the RfD is the dose-response criterion

most appropriate for quantitatively estimating noncarcinogenic effects. The RfD is derived from the following equation:

$$RfD\ (mg/kg/day) = \frac{NOAEL\ or\ LOAEL}{UF\ and/or\ MF}$$

The No Observable Adverse Effect Level (NOAEL) represents the dose of a chemical at which there are no statistically or biologically significant differences in the frequency of an adverse effect between the exposed population and its appropriate control. The Lowest Observable Adverse Effect Level (LOAEL) represents the lowest dose at which a statistically significant difference in the frequency of an effect is noted. Both the NOAEL and the LOAEL are reported in terms of mg/kg/day. An uncertainty factor (UF) of ten per type of uncertainty (e.g., extrapolation from animal sensitivity to human sensitivity, relationship between lowest adverse effect level and no adverse effect level) is used to account for interspecies and interspecies differences, severity of the adverse effect, whether the dose was an NOAEL or an LOAEL, and the adequacy of the data. The magnitude of the UF will therefore vary from chemical to chemical, ranging from 10 to 10,000. A modifying factor (MF), ranging from less than 1 to 10 may also be added to reflect qualitative uncertainties not explicitly addressed in the UFs. The toxicity endpoint upon which the RfD is derived and the UF and/or MF used in the calculation are presented in the dose-response tables. No RfDs are available for the dermal route of exposure but are instead calculated from oral RfDs using the methodology described in subsection 3.1.1 (USEPA, 2004).

The use of chronic RfDs to evaluate the potential for adverse health effects resulting from substantially less-than-lifetime exposures may be overly protective. Subchronic Reference Doses (RfD_ss) have been developed for many chemicals to evaluate the potential noncarcinogenic effects of limited duration exposures. RfD_ss are similar to chronic RfDs; the distinction is the length of exposure duration. When available, RfD_ss/RfC_ss are used in this risk assessment to evaluate noncarcinogenic effects to a construction worker. When RfD_ss are unavailable, chronic RfDs are used to evaluate noncarcinogenic effects for these receptors.

The dose-response data for noncarcinogenic effects (RfDs) and their critical toxic effects are presented in Appendix B, for both chronic and subchronic effects.

3.1.3 Dermal Dose-Response Values

Cancer SFs and non-cancer RfDs were developed to evaluate risk associated with the dermal contact exposure route. In accordance with USEPA guidance (USEPA, 2001a), dermal dose-response values are calculated from oral dose-response values using an oral absorption factor. The oral absorption factor represents the amount of substance that is absorbed from the gastrointestinal tract following oral administration of a substance. The absorbed dose represents the amount of substance that is potentially available for biological interaction; it is this dose-response relationship that the toxicity of a dermally absorbed substance must be evaluated by. Thus, for potentially carcinogenic substances, the dermal dose-response value is calculated as follows:

$$SF_d = SF_{oral} / Oral\ ABS$$

The dermal dose-response value for evaluating non-carcinogenic effects is calculated as follows:

$$RfD_d = RfD_{oral} x\ Oral\ ABS$$

The Oral ABS is the fraction of contaminant absorbed in the gastrointestinal tract (dimensionless) in the critical toxicity study. Chemical-specific Oral ABS values are published by USEPA (USEPA, 2004). In accordance with USEPA guidance (USEPA, 2004), oral dose-response values are only adjusted using an Oral ABS value if the COPC has an oral ABS value less than 50%. Otherwise, the oral dose-response value is used as the dermal dose-response value. Dermal SFs and RfDs are presented in Appendix B.

3.1.4 Sources of Dose-Response Values

The following hierarchy of sources for dose-response values has been utilized in identifying dose-response values for this HHRA.

Tier 1- IRIS (http://www.epa.gov/iris/). In accordance with USEPA guidance, the main source of dose-response values is the USEPA Integrated Risk Information System (IRIS), which is a database established by USEPA containing all validated data on many toxic substances found at hazardous waste Sites. This database was used to identify the SFs and RfDs applied in this risk assessment (USEPA, 2006).

Tier 2- NCEA's provisional peer reviewed toxicity values (PPRTVs). NCEA's PPRTVs are developed by the Superfund Technical Support Center (STSC) for the EPA Superfund program.

STSC's reassessment of HEAST toxicity values, as well as development of PPRTVs in response to Regional or Headquarters Superfund program requests, are consistent with Agency practices on toxicity value development, use the most recent scientific literature, and are supported by both internal and external peer review, providing a high level of confidence in the use of these values in the Superfund Program.

Tier 3 - Other toxicity values

- Cal EPA's toxicity values. Cal EPA develops toxicity values for both cancer and non-cancer effects. Cal EPA toxicity values are obtained on the Cal EPA website at http://www.oehha.ca.gov/risk/chemicalDB//index.asp.

- ATSDR's MRLs address non-cancer effects only, and are available on the ATSDR website at http://www.atsdr.cdc.gov/mrls.html.

- Toxicity values remaining in current versions of HEAST (1997a).

In this HHRA, the majority of dose-response values used are published in IRIS. For some Site-related COPCs required dose-response data are only available as NCEA provisional values or from CAL-EPA. These dose-response values were used in this HHBRA in order to provide a more complete evaluation of potential risks.

For tetrachloroethylene, the toxicity values from Cal EPA and not the NCEA provisional values have been utilized.

Uncertainties related to the absence of dose-response data, particularly for COPCs for which the exposure pathway, which represents the only pathway or most significant exposure pathway, has no toxicity criterion, will be discussed in the risk assessment uncertainty analysis.

3.1.5 Exposure to Lead in Site Media

No dose-response values are published for potential exposures to lead. In the absence of dose-response data, USEPA recommends use of lead biokinetic uptake models to evaluate potential lead exposures. The biokinetic uptake models provide an estimate of blood lead levels in exposed populations. Risks for potential exposures to lead are characterized by comparing the estimated blood lead levels in exposed individuals to threshold blood lead levels that are protective for adverse health effects resulting from lead exposure.

4.0 EXPOSURE ASSESSMENT

4.1 DESCRIPTION OF CURRENT AND FORESEEABLE FUTURE SITE USE

The current and foreseeable future Site uses were identified in Section 1. In summary, under current conditions the Site is fenced and posted with signage reflecting the Rhode Island Department of Health (RIDOH) and RIDEM advisory concerning the safe uses of Mashapaug Pond (including the cove). The advisory (copy in Appendix B of the SIR) recommends that people do not do the following:

- Drink pond water,
- Eat fish caught in Mashapaug Pond,
- Swim, wade, play or bathe in pond water, and
- Boat whenever thick scum, algae mats, or foul odors occur on the pond.

These advisories are in place due to the high levels of bacteria (Fecal Coliform) following rainstorms, also blue green algae (cyanobacteria) found in the pond can produce toxins that can harm humans and animals that swim in or drink pond water during algae blooms. The fish consumption advisory was issued due to reported concentrations of PCBs and dioxins in sediment. Nonetheless, it is possible that trespassers gain access to the Site area.

The future use of the Site is commercial/industrial.

4.2 IDENTIFICATION OF POTENTIAL HUMAN RECEPTORS AND EXPOSURE PATHWAYS

This subsection describes the receptors, exposure pathways, exposure parameters and exposure points for the commercial/industrial worker and the trespasser. The potential receptor populations and exposure pathways were identified in Section 1. Therefore, this section focuses on identifying the exposure scenarios that are used to characterize health risks for the potential receptor populations and potentially complete pathways.

This step involves the identification of all relevant exposure pathways through which specific populations may be exposed (current and future) to contaminants at the site. An exposure pathway consists of four necessary elements: 1) a source or mechanism of chemical release; 2) a transport or retention medium; 3) a point of human contact; and 4) a route of exposure at the point of contact (USEPA, 1989a).

Exposures were evaluated based on two scenarios, the Reasonable Maximum Exposure (RME) and Central Tendency (CT) scenarios. The RME and CT scenarios are characterized by coupling the contaminant concentrations with conservative exposure parameters developed for each exposure scenario. The CT exposure is the typical or average exposure that would be expected in a population. The RME is the highest exposure that is reasonably expected to occur at a site. The RME and CT scenarios are summarized in Table 8 thru 11 and are discussed in sections below, and results are described in the text. Exposure parameters are obtained from USEPA guidance (USEPA, 1997a) and other USEPA-approved sources. In general, RME parameters represent 95th percentile values and CT parameters represent mean values.

4.2.1 Receptor Exposure Scenarios for Surface Water and Sediment

Exposure parameters for the RME were selected from USEPA guidance documents (USEPA, 1994; 1997; 2004) and were based on professional judgment considering the site-specific exposure conditions. This subsection describes the exposure scenarios and RME exposure parameters in detail. Exposure parameters for the CT were based on the RME values, with the following modifications:

- CT values for incidental ingestion of sediment, and surface water were identified as one-half the RME values, based on USEPA Region I guidance (USEPA, 1994) which recommends using one-half the RME value as the CT value for incidental soil ingestion.
- CT values for sediment dermal adherence were the recommended CT parameters from USEPA RAGS Part E guidance (USEPA, 2004).
- The RME values assume that a receptor uses the Site for all of their outdoor activities (e.g., recreational play/exploration, recreational angling, or subsistence angling). The CT parameters accommodate the assumption that a more "typical" or "average" receptor would spend a portion of their outdoor time at the Site (i.e., would access other, non-Site related areas for recreational purposes).

Commercial/Industrial Worker

Although the site is currently unoccupied a potentially future use would include commercial/industrial use. Although it would be unlikely, commercial/industrial workers could potentially wade in Mashapaug Pond. Potential exposures to surface water and aquatic (submerged) sediment by incidental ingestion and dermal contact could occur during wading.

Cancer and non-cancer risk estimates are calculated separately for each of the exposure media and exposure points. The risks for each medium are summed to derive a total risk for surface water and sediment at each exposure point.

The RME and CT exposure parameters for surface water are presented in Tables 8 and 10, for sediment in Tables 9 and 11.

Exposure Duration. For both the RME and CT scenarios, it is assumed that the commercial/industrial worker remains at the same place of employment over a 25-year period (USEPA, 2002).

Exposure Frequency. It is assumed that a commercial/industrial worker visits the water bodies for wading only mid May through mid September. It is further assumed that during summer months, is wading defined as standing or walking in water to a depth of the knees. It is assumed that a commercial/industrial worker wades in the pond once a week from mid May to mid September for a total of 17 times per year.

Exposure Time and Event Frequency. Exposures to surface water during wading activities are assumed to occur 1 hour per event, with 1 event per day exposed (i.e., 1 hour per day), based on the recommended exposure time for recreational swimming (USEPA, 1997). The swimming value would likely, overestimate wading time.

Body Weight. Body weight values for adults are based on values recommended in USEPA guidance (USEPA, 1994).

Incidental Ingestion Rate and Fraction Ingested. The incidental ingestion rate for surface water is based on the recommended value for incidental ingestion of water during swimming of 50 ml per hour (USEPA, 1988). The fraction ingested parameter for surface water is 100%, indicating that 100% of surface water intake on the day-exposed is assumed to occur at the Site. Once again, the water ingestion estimate for swimming likely overestimates ingestion for a wading scenario.

Human exposure parameter values specifically applicable to sediment are not provided in USEPA Region I or USEPA national guidance. Since incidental ingestion exposure to soil (or sediment) primarily occurs through hand-to-mouth transfer of material that has adsorbed to the skin, it is unlikely that ingestion exposure to COPCs in submerged sediment would occur through hand-mouth contact because sediment would wash off of the hand while the hand was being removed from the water. Nonetheless, it is possible that some sediment would adhere to the skin when

leaving a water body (i.e., some sediment may not wash off), and it is possible that sediment entrained in the surface water could be ingested if surface water is incidentally ingested.

Incidental ingestion values for soil may be used for sediment. However, values for soil are generally considered conservative for sediment because: 1) The mechanism of exposure to sediment is different from soil, resulting in less particle adherence to the skin and lower dermal and ingestion exposures, as outline above; and 2) soil incidental ingestion rate values are based on daily intakes from all sources of soil and sediment; it is not generally appropriate to assume that a receptor's total daily intake of soil and sediment is derived from sediment on the days of sediment exposure. Given these considerations, the soil ingestion rates published by USEPA Region I (USEPA, 1994) are used as sediment ingestion rates, and the fraction ingested parameter for sediment of 100% is applied for the commercial/industrial worker.

Dermal Surface Area and Adherence Factor. Surface water exposures for the commercial/industrial worker would involve contact with only the lower legs, feet, and hands.

Exposures to aquatic sediments that are submerged beneath the water are unlikely to be substantial. In order for dermal absorption of COPCs from sediment to occur, the material must adhere to the skin (USEPA, 2004). Sediment that is submerged would not adhere to skin, as the surrounding surface water would prevent binding of the sediment to the skin. In addition, when a body part that contacts sediment is removed from the surface water body, the majority of sediment would wash off, thereby preventing adherence of the material. Hence, although dermal exposures to COPCs in sediment are likely to be negligible, they are quantified to account for the possibility that some sediment may remain adhered to the skin following contact with surface water.

Exposure parameter values for soil may be used for sediment. However, exposure parameter values for soil are generally too conservative for sediment as outlined above. Therefore, dermal surface area and adherence values are based on the following:

- Adult wader: Body surface area values for feet, lower legs, and hands (average of 50th percentile values for males), and RAGS Part E resident default values for soil adherence for sediment exposure. The choice of these values indicates that upper legs, arms, and face would not contact sediment.

Trespasser

Although the site is currently surrounded by a fence, and signs are posted along the fence advising people not to enter the Site. Trespassers may circumvent the fence and enter the Site for various activities. It is assumed that area trespassers would include older children (ages 7 through 18), and adults (assumed ages 19 through 30). It is also assumed that a younger child (ages 1 through 6) would not trespass onto the site and therefore will not be evaluated in this HHRA. Potential exposures to surface water and aquatic (submerged) sediment by incidental ingestion and dermal contact may occur during wading, or swimming. In is assumed that a potential trespasser could swim or wade in either the inner cove or outer cove. However, realistically, swimming and wading are more likely to occur outside the cove. In the summer months, which is when swimming and wading are likely to occur, the cove becomes covered with aquatic vegetation making it a less desirable place for wading or swimming as compared to the outside the cove. Also the depth of water in the inner cove is relatively shallow (generally less than 3 feet during the summer) which would make swimming difficult.

Cancer and non-cancer risk estimates are calculated separately for each of the exposure media and exposure points. The risks for each medium are summed to derive a total risk for surface water and sediment at each exposure point.

The trespasser RME and CT exposure parameters for surface water are presented in Tables 8 and 10, for sediment in Tables 9 and 11.

Exposure Duration. For the RME scenario, it is assumed that the trespasser is an area resident who is raised at and remains at the same residence over a 30-year period (USEPA, 1994). The 30-year duration is segregated into three age periods: young-child (ages 1 through 6) for 6 years (not evaluated); older child (ages 7 through 18) for 12 years; and adult (ages 19 through 30) for 12 years. The CT exposure duration values are based on the recommended CT parameters for exposure duration published in USEPA RAGS Part E of 9 years. The 9-year exposure duration value was segregated as follows: young child (2 years); older child (3 years); and adult (4 years).

Exposure Frequency. It is assumed that a trespasser visits the water bodies for wading and swimming mid May through mid September. It is further assumed that during summer months, wading (defined as standing or walking in water to a depth of the knees) occurs more frequently

than swimming (defined as total submersion of the body in water). The exposure frequency associated with these various activities is broken down as follows:

Activity	RME Frequency / Period	RME Total No. Days per Year	
		Adolescent Trespasser	Adult Trespasser
Swimming	1x/week: mid May – mid Sep	17	17
Wading	2x/week: mid May – mid Sep	34	34
Total Days per Year of Water Bodies Exposure	3x/week: mid May – mid Sep	51	51

Activity	CT Frequency / Period	CT Total No. Days per Year	
		Adolescent Trespasser	Adult Trespasser
Swimming	1x/week: mid May – mid Sep	17	17
Wading	1x/week: mid May – mid Sep	17	17
Total Days per Year of Water Bodies Exposure	2x/week: mid May – mid Sep	34	34

The exposure frequency during the summer months assumes that wading and swimming each occur on the same day, such that a total of three visits to the water body occur each week for RME and a total of two visits to the water body for CT.

Contact with submerged sediment is not likely to be substantial under any of the scenarios, as explained under "Ingestion Rate" below. However, if contact with sediment were to occur, it would be during wading activities when a person is standing in the water (i.e., standing in the sediment), and not when a person is actively swimming (i.e., when body parts do not contact the sediment for more than a minute or two). However, it is assumed here that on days when swimming occurs, sediment is contacted at the same rate as on those days when only wading occurs. A person would likely contact sediment on swimming days when they made they wade into and out of the water and as they take breaks from active swimming. During the breaks form active swimming, person may be standing in water, with most of their body immersed, with feet contacting sediment. Therefore, the exposure frequency for sediment is based on the exposure frequency for wading (51 RME and 34 CT days per year for adults/older child). The exposure

frequency for surface water is based on the total frequency for wading and swimming (68 RME and 51 CT days per year).

Exposure Time and Event Frequency. Exposures to surface water during swimming or wading activities are assumed to occur 1 hour per event, 1 event per day (i.e., 1 hour per day), based on the recommended exposure time for recreational swimming (USEPA, 1997).

Body Weight. Body weight values for young children and adults are based on values recommended in USEPA guidance (USEPA, 1994). Body weight values for older children are based on the average of 50th percentile body weights for males ages 7 through 18 (USEPA, 1997).

Incidental Ingestion Rate and Fraction Ingested. The incidental ingestion rate for surface water is based on the recommended value for incidental ingestion of water during swimming of 50 ml per hour (USEPA, 1988). The fraction ingested parameter for surface water is 100%, indicating that 100% of surface water intake on the day-exposed is assumed to occur at the Site.

Human exposure parameter values specifically applicable to sediment are not provided in USEPA Region I or USEPA national guidance. Since incidental ingestion exposure to soil (or sediment) primarily occurs through hand-to-mouth transfer of material that has adsorbed to the skin, it is unlikely that ingestion exposure to COPCs in submerged sediment would occur through hand-mouth contact because sediment would wash off of the hand while the hand was being removed from the water. Nonetheless, it is possible that some sediment would adhere to the skin when leaving a water body (i.e., some sediment may not wash off), and it is possible that sediment entrained in the surface water could be ingested if surface water is incidentally ingested.

Incidental ingestion values for soil may be used for sediment. However, values for soil are generally considered conservative for sediment because: 1) The mechanism of exposure to sediment is different from soil, resulting in less particle adherence to the skin and lower dermal and ingestion exposures, as outline above; and 2) soil incidental ingestion rate values are based on daily intakes from all sources of soil and sediment; it is not generally appropriate to assume that a receptor's total daily intake of soil and sediment is derived from sediment on the days of sediment exposure. Nonetheless, it is possible that some receptors could spend most of their outdoor recreational time at the cove's edge rather than at their own yard. Given these considerations, the

soil ingestion rates published by USEPA Region I (USEPA, 1994) are used as sediment ingestion rates, and the fraction ingested parameter for sediment of 100% is applied for the trespasser.

Dermal Surface Area and Adherence Factor. The dermal surface area for surface water is different between wading and swimming exposures. Wading exposures for the trespasser would involve contact with only the lower legs, feet, and hands, whereas swimming exposures would involve contact with the entire body. For adults and older children, the surface water exposures are quantified using the frequency-weighted average dermal surface area associated with wading and swimming. These weighted average surface area values reflect the relative frequencies of wading and swimming activities and they are presented in Tables 8 and 10.

Exposures to aquatic sediments that are submerged beneath the water are unlikely to be substantial. In order for dermal absorption of COPCs from sediment to occur, the material must adhere to the skin (USEPA, 2004). Sediment that is submerged would not adhere to skin, as the surrounding surface water would prevent binding of the sediment to the skin. In addition, when a body part that contacts sediment is removed from the surface water body, the majority of sediment would wash off, thereby preventing adherence of the material. Hence, although dermal exposures to COPCs in sediment are likely to be negligible, they are quantified to account for the possibility that some sediment may remain adhered to the skin following contact with surface water.

Exposure parameter values for soil may be used for sediment. However, exposure parameter values for soil are generally too conservative for sediment as outlined above. Therefore, dermal surface area and adherence values are based on the following:

- Older child and adult wader: Body surface area values for feet, lower legs, and hands (average of 50th percentile values for males), and RAGS Part E resident default values for soil adherence for sediment exposure. These values account for the fact that upper legs, arms, and face would not contact sediment.

4.3 IDENTIFICATION OF EXPOSURE POINTS AND EXPOSURE ROUTES

For the purpose of this HHRA two separate exposure points were evaluated for each receptor. The exposure points are the inner cove and outer cove. The inner cove is defined as the area which is contained by the two peninsulas, which includes locations SW/SED16, SW/SED17, SW/SED18, SW/SED19, SW/SED20, SW/SED21, SW/SED22, SW/SED23, SW/SED24, SW/SED25, SW/SED26, SW/SED27, SED28, SED29, SED30, SED31, SED32, and SD-1001 threw SD-1005.

The outer cove is defined as the area from the two peninsulas to just beyond the property line, which includes locations SW/SED10, SW11, SW/SED12, and SED13. Sample locations SED11, SED14, and SED15 are not include in the outer cove exposure point. The depth of surface water at these locations is 6 feet or greater. As previously discussed, contact to sediment is most likely to occur during wading activities when a person is standing in the water (i.e., standing in the sediment), and not when a person is actively swimming, therefore contact to sediment under 6 or more feet of water is assumed not to occur.

4.4 IDENTIFICATION AND ESTIMATION OF EXPOSURE POINT CONCENTRATION (EPC)

A single concentration is selected as representative of the actual concentration for each COPC in a given medium for a given exposure point. This value, called the EPC, is used in the estimates of health risks at the site. An EPC is selected for every COPC identified in the screening process described earlier.

For the RME the 95% Upper Confidence Limit (UCL) on the mean is typically used as the EPC. There are two exceptions to this rule. In the case where the 95% UCL is greater than the maximum detected concentration; and/or if there are fewer than 10 samples in a data set (the UCL is not calculated). For these two situations, the maximum detected concentration should be used as the RME EPC.

For the CT the arithmetic mean is typically used as the EPC. In the case where arithmetic mean is greater than the maximum detected concentration the maximum detected concentration is used as the CT EPC.

A summary of the calculation of EPC for surface water and sediment is presented in Tables 12 and 13 respectively. 95% UCLs were calculated using USEPA's Pro UCL software; documentation on the calculation of 95% UCLs is presented in Appendix C.

4.5 QUANTIFICATION OF EXPOSURES

For each of the potentially exposed populations a COPC intake was calculated. Population-related variables were selected that describe the characteristics associated with individual receptors in that population. For example, intake is dependent upon contact rate, age, body

weight, body surface area, exposure frequency, exposure duration, and averaging time. When possible, variables such as age, body weight, and body surface area will selected from USEPA guidance documents, including "Dermal Exposure Assessment: Principles and Applications (USEPA, 2004 and The Exposure Factors Handbook (USEPA, 1998).

The general equation for calculating chemical intake from the various media is:

$$ADI = \frac{C \times CR \times EF \times ED \times CF}{BW \times AT}$$

Where

ADI	=	average daily chemical intake, chemical, media and receptor specific
C	=	chemical concentration, media specific
CR	=	contact rate, media specific
EF	=	exposure frequency, population specific
ED	=	exposure duration, population specific
CF	=	conversion factor, media specific
BW	=	body weight of hypothetically exposed individual
AT	=	averaging time (for carcinogens, AT=70 years x 365 days per year; for noncarcinogens, AT=ED x 365 days per year).

Intakes for all potential exposure pathways identified for this site will be calculated per Section 6 of RAGS Part A (USEPA, 1989) and RAGS Part E (USEPA, 2004). Specific algorithms for calculation of intakes are presented in Tables 8 - 11. Intake calculations are documented in Appendix D.

Due to the uncertainties associated with characterization of dermal exposure risks to PAHs and dioxin in surface water, PAHs and dioxin in surface water were excluded from the dermal exposure pathway. Potential risks associated with dermal exposures to PAHs and dioxin in surface water are discussed in Appendix E.

5.0 HUMAN HEALTH RISK CHARACTERIZATION

Calculated risks to each receptor were then compared to the remedial objectives as outlined in the Remediation Regulations (RIDEM, 2004):

1. The excess lifetime cancer risk for each carcinogenic substance does not exceed 1 x 10^{-6} and the cumulative excess lifetime cancer risk (ELCR) posed by the site does not exceed 1 x 10^{-5};

2. The hazard index for each substance does not exceed a hazard index of 1 and the cumulative hazard index posed by the contaminated-site does not exceed 1 for any target organ.

Risk summaries for both the RME and CT scenarios are presented in Tables 14 and Table 15 respectively. Risk calculations are presented in Appendix D.

Outer Cove

The risk characterization results for the Outer Cove are summarized below:

- The RME and CT cumulative and individual chemical HI values for the Industrial/Commercial worker and the trespasser exposures to surface water and sediment in the Outer Cove are below the target risk level.
- The RME and CT cumulative and individual chemical ELCR for the Industrial/Commercial worker exposures to surface water and sediment in the Outer Cove are below the target risk levels.
- The CT cumulative and individual chemical ELCR for the trespasser for exposure to surface water and sediment in the Outer Cove are below the target risk levels.
- The RME cumulative ELCR for the trespasser in the Outer Cove meets the target risk level of 1 x 10^{-5}; however, the RME individual chemical cancer risk for arsenic in sediment is greater than the individual chemical risk limit of 1 x 10^{-6}.
- In summary, the Outer Cove risks meet the risk management criteria and no remediation would be required for the RME and CT Industrial/Commercial worker scenario and the CT trespasser scenario. However, for the RME trespasser scenario, the arsenic ELCR of 1.6 x 10^{-6} is above the individual chemical target risk of 1 x 10^{-6}.

Inner Cove

The risk characterization results for the Inner Cove are summarized below:

- For the Inner Cove RME and CT scenarios, there are no individual chemicals which have a HI greater than one, and the cumulative HI for each receptor is less than 1 for any target organ, indicating that the non-cancer risks meet the target risk levels.
- The RME and CT cumulative and individual chemical ELCR for the Industrial/Commercial worker exposures to surface water and sediment in the Inner Cove meet the target risk levels.
- .The Inner Cove CT cumulative ELCR for the adolescent trespasser and adult trespasser are each 1 X 10^{-6}, giving the trespasser a cumulative receptor risk of 2 X 10^{-6} (below the cumulative risk limit). However, the Inner Cove CT individual chemical cancer risk for dioxin TEQ for the adolescent and adult trespasser combined is greater than the individual chemical cancer risk limit of 1 x 10^{-6}.

- The Inner Cove RME cumulative ELCR for the adolescent trespasser and adult trespasser are 2 x 10^{-5} and 1 x 10^{-5}, respectively, giving the trespasser a cumulative receptor risk of 3 x 10^{-5}(above the cumulative risk limit). Dioxin TEQ is the largest contributor to the cumulative ELCR. Also, for the RME combined adolescent and adult trespasser scenario the individual carcinogenic substance ELCR for TCE, vinyl chloride, benzo(a)pyrene, arsenic and dioxin TEQ are greater than 1 x 10^{-6}(above the risk limit).

In summary, the RME and CT ELCR and Hazard Index values for the Industrial/Commercial Worker for both the Outer Cove and the Inner Cove meet the Remediation Regulations risk limits. The RME and CT Hazard Index values for the Trespasser for the Outer Cove and Inner Cove meet the Remediation Regulations limits. However, the RME and CT ELCR for the trespasser exceed at least one of the Remediation Regulation Limits for cancer risk at both the Outer Cove and the Inner Cove. Dioxin TEQ in sediment is the largest cancer risk contributor for the Inner Cove exposure scenarios.

5.1 EVALUATION OF LEAD IN SITE MEDIA

Blood lead levels were calculated for the trespasser and commercial/industrial worker exposure scenarios using USEPA's adult biokentic uptake model (USEPA, 2003). This model was used to estimate blood lead levels in these receptor populations that could result from potential exposure to lead in sediment. Although USEPA publishes an integrated exposure uptake biokentic uptake (IEUBK) model for children, that model is specifically designed and calibrated to characterize blood lead levels in children younger than age 7 who are assumed to be exposed to lead-containing soil at a high frequency over long periods (e.g., 12 months per year, over several years). The IEUBK model for young children is not applicable to this Site because potential exposures to lead would occur to children over age 6 and to adults, infrequently, via contact with sediment.

The adult biokinetic model calculations are presented in Tables 16 and 17. The model calculations are based on the following:

- Equation 1 is used to estimate blood lead levels. This equation excludes contribution of lead intake from fugitive dust emissions from the Site, and is the appropriate algorithm to use since dust cannot be liberated from sediment;
- The sediment EPC is 551 mg/kg;
- With the exception of the sediment exposure frequency parameters that are applicable to the commercial/industrial worker and trespasser exposure scenarios (Tables 16 and 17), the biokinetic model inputs are the default variables provided in the lead model guidance (USEPA, 2003);

- Two blood lead levels were calculated for each receptor scenario using a range of geometric standard deviation (GSDi) and baseline blood lead levels. This provides a range of estimated blood lead levels for highly sensitive and less sensitive populations.

USEPA indicates that blood lead levels should be compared to a target blood level of 10 ug/deciliter (dL), and that the probability of blood lead levels exceeding this threshold value should not exceed 5%. The target blood lead level is a multi-agency goal that has been designated by the US Centers for Disease Control (CDC) and Agency of Toxic Substances and Disease Registry (ATSDR) as a level of concern to protect sensitive populations such as neonates, infants, and children. This threshold blood lead level is applied in the adult lead model to ensure that females who may be pregnant are adequately protected. Specifically, the 95th percentile blood lead level among fetuses of females is compared to the 10 ug/dL threshold level.

As indicated in Table 16, the biokentic modeling results for trespassers are as follows:

- The estimated blood lead levels in trespassers assumed to be exposed to lead in sediment range from 1.7 ug/dL to 1.9 ug/dL. These blood lead levels are applicable to males and females of non-child bearing age.
- The estimated 95th percentile blood lead levels among fetuses of females range from 5.1 ug/dL to 6.7 ug/dL, and the probability that fetal blood lead concentrations would exceed the 10 ug/dL threshold level range from 0.6% to 1.7% These blood lead levels are applicable to females of child-bearing age.

The results of this evaluation indicates that lead in sediment would not pose health risks of concern to trespassers.

As indicated in Table 17, the biokentic modeling results for commercial/industrial workers are as follows:

- The estimated blood lead levels in trespassers assumed to be exposed to lead in sediment range from 1.6 ug/dL to 1.8 ug/dL. These blood lead levels are applicable to males and females of non-child bearing age.
- The estimated 95th percentile blood lead levels among fetuses of females range from 4.8 ug/dL to 6.2 ug/dL, and the probability that fetal blood lead concentrations would exceed the 10 ug/dL threshold level range from 0.4% to 1.4% These blood lead levels are applicable to females of child-bearing age.

The results of this evaluation indicates that lead in sediment would not pose health risks of concern to commercial/industrial workers.

6.0 UNCERTAINTY

Due to the uncertainty associated with the potential human skin contact (dermal) exposure to PAHs and dioxins and furans in surface water the dermal exposure pathway for PAHs and dioxins and furans in surface water was not evaluated in the this report. There are a number of uncertainties associated with the dermal exposure pathway for dioxins and furans in surface water, including:

- Surface water is a dynamic exposure medium. As flow rates vary with precipitation events, the amount of suspended particulate matter (aquatic sediments especially) also varies. Sampling of surface water at a few points in time provides snapshots of conditions, but may not provide representative data for long-term exposure.
- PAHs and dioxins and furans have low water solubility and have an affinity for particulate matter and organic carbon. Dioxins and furans could be associated with suspended particulate matter as well as the dissolved phase. The available surface water samples were not filtered and, therefore, represent PAH and dioxin and furan concentrations that are not specifically representative of dissolved phase concentrations.
- The diffusion-based dermal exposure assessment model is based on an assumed dissolved-phase compound being present in water that is contacting the skin. The available surface water data may over-estimate the dissolved phase concentrations in surface water.
- The diffusion-based dermal exposure assessment model (from RAGS Part E) utilizes estimated permeability constants (K_p) for PAHs and dioxin and furan compounds. However, PAHs and dioxin's physical characteristics are identified by USEPA as being outside the Effective Prediction Domain (EPD) for the model used to estimate K_p values.

Appendix E presents an uncertainty analysis that evaluates the potential contribution to risks if the PAH and dioxin surface water data are included in the risk calculations. As indicated in Appendix E, the estimated cancer risks would increase, and in that scenario, surface water dermal contact would become the predominant ELCR contributor

The presence of PAHs and dioxins in sediment indicates that additional evaluation should be conducted to address potential bioaccumulation of those compounds in biota such as fish in the cove. These compounds have the potential to accumulate in biota, and consumption of biota could potentially result in exposure. Given the relatively small area of impacted sediments, consumption of biota may, however, represent a minimal potential exposure pathway. Under current conditions, consumption of fish from Mashapaug Pond is discouraged by the RIDEM/RIDOH advisory.

7.0 CONCLUSIONS

In summary, the RME and CT ELCR and Hazard Index values for the Industrial/Commercial Worker for both the Outer Cove and the Inner Cove meet the Remediation Regulations risk limits. Therefore, no remediation of surface water or sediment is required for the Industrial/Commercial scenario. The RME and CT Hazard Index values for the trespasser for the Outer Cove and Inner Cove meet the Remediation Regulations limits. However, the RME and CT ELCR for the trespasser exceed at least one of the Remediation Regulation Limits for cancer risk at both the Outer Cove and the Inner Cove. TCE, vinyl chloride, benzo(a)pyrene, arsenic and dioxin TEQ in sediment of the Inner Cove each contribute cancer risk greater than one in one million. For the Outer Cove, only arsenic contributes cancer risk greater than one in one million, and it is not certain that the arsenic concentrations are Site-related.

8.0 REFERENCES

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FIGURES

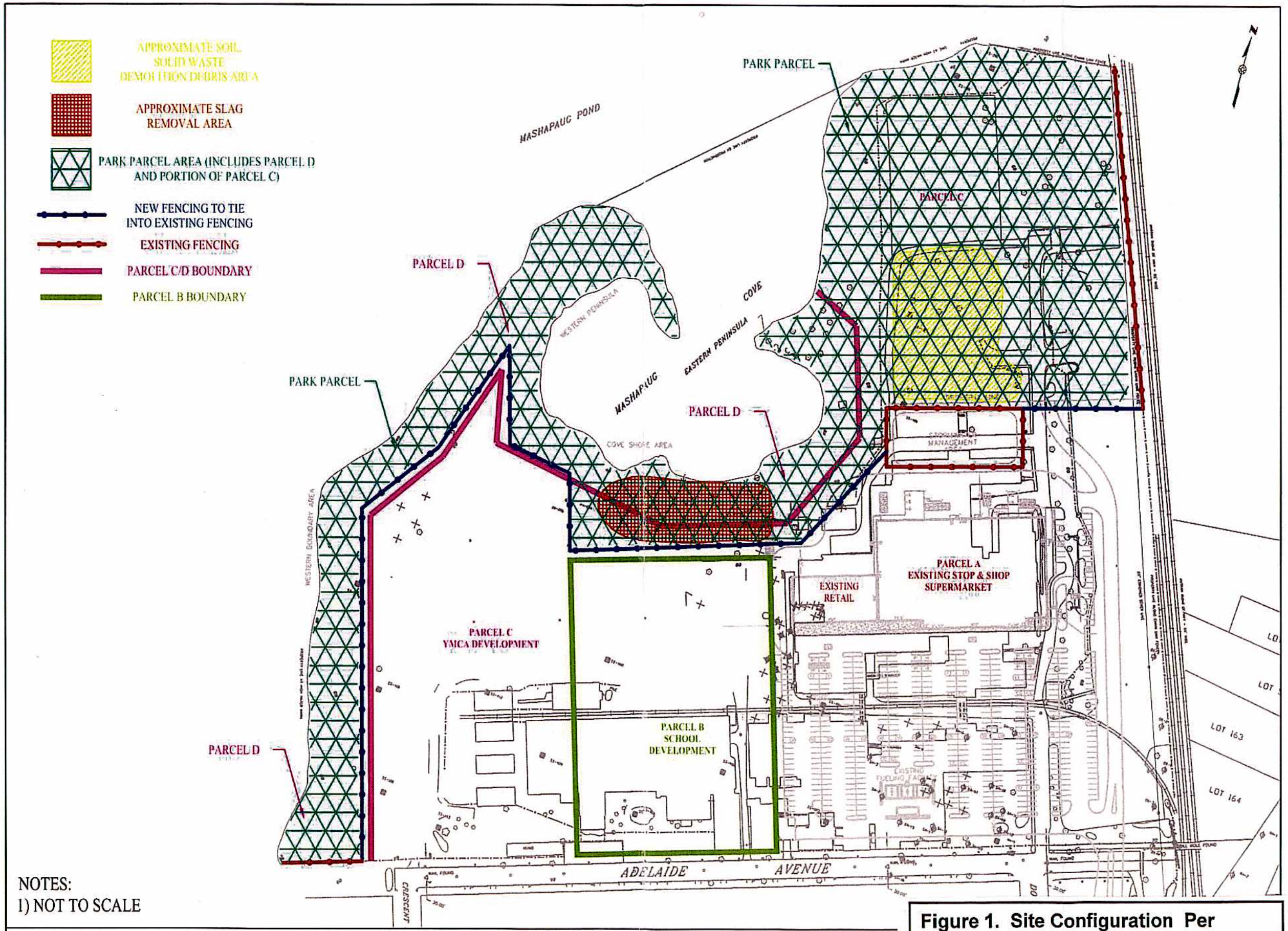
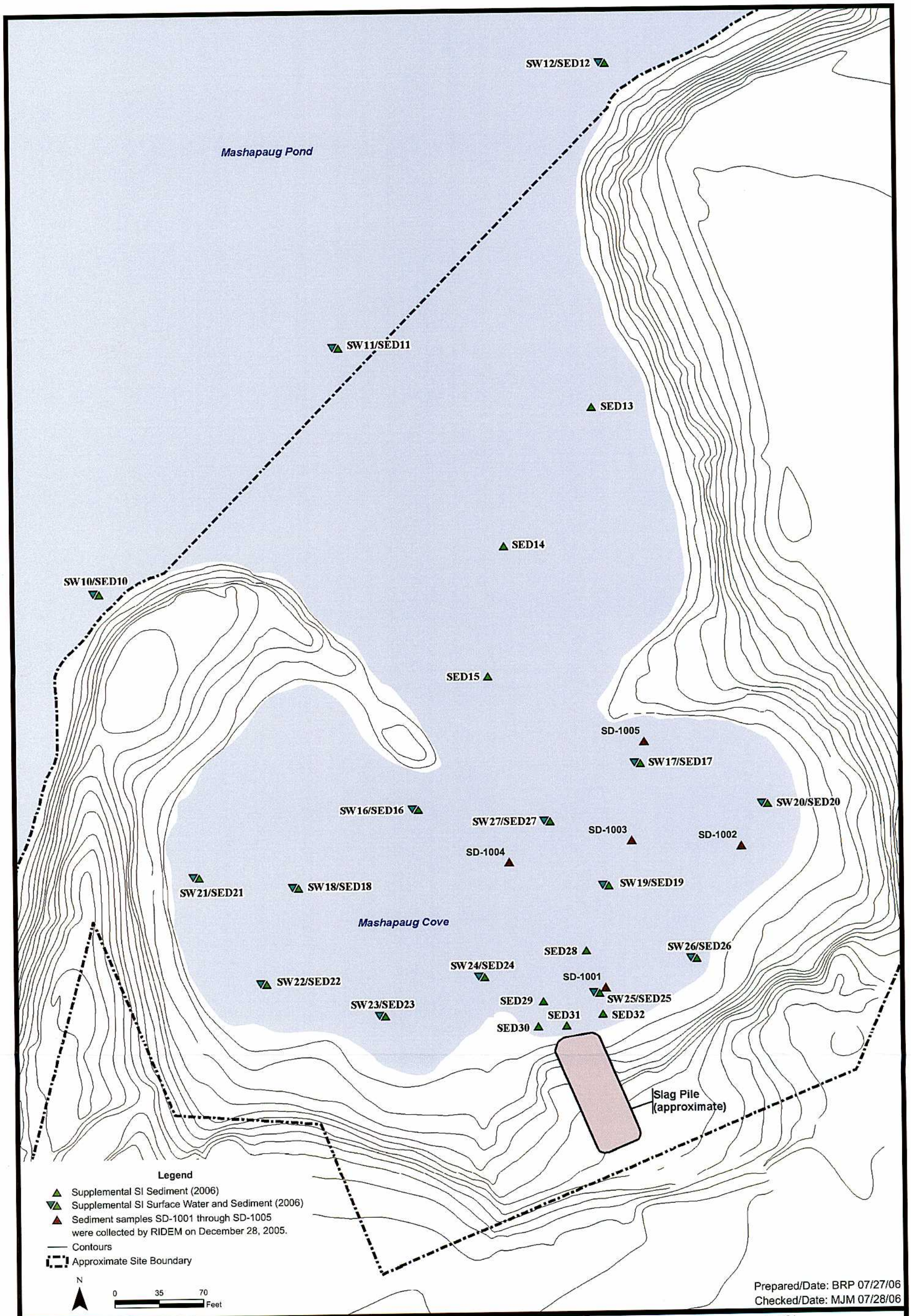


Figure 1. Site Configuration Per Exhibit A of March 2006 Consent Order
333 Adelaide Avenue
Providence, Rhode Island



Supplemental SI
Former Gorham Manufacturing Site
Providence, Rhode Island

MACTEC

Supplemental SI
Cove Sample Locations
Project 3650-05-0041
Figure 2

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TABLES

Table 1
Surface Water Data - Detected Parameters
Supplemental Site Investigation Report
Former Gorham Manufacturing Site
333 Adelaide Avenue
Providence, Rhode Island

Parameter	Frequency of Detection	Range of Non Detects	Range of Detected Concentrations	Average of Samples	SW10 SW10 6/21/2006	SW11 SW11 6/21/2006	SW12 SW12 6/21/2006	SW16 SW16 6/21/2006	SW17 SW17 6/21/2006	SW18 SW18 6/21/2006	SW19 SW19 6/21/2006	SW20 SW20 6/21/2006
Volatile Organics (mg/L)												
1,1,1-Trichloroethane	11 / 15	0.001 - 0.001	0.001 - 0.0018	0.0012	<0.001	<0.001	<0.001	0.0016	0.0018	0.0013	0.0014	<0.001
1,1-Dichloroethane	5 / 15	0.001 - 0.001	0.001 - 0.0014	0.00073	<0.001	<0.001	<0.001	0.0011	0.0014	<0.001	0.001	<0.001
1,2,4-Trimethylbenzene	2 / 15	0.001 - 0.001	0.001 - 0.0011	0.00057	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001
cis-1,2-Dichloroethene	15 / 15		0.0015 - 0.0108	0.0046	0.0022	0.0108	0.0015	0.0045	0.0045	0.0048	0.0062	0.0025
Ethylbenzene	3 / 15	0.001 - 0.001	0.001 - 0.001	0.00060	<0.001	<0.001	<0.001	0.001	0.001	<0.001	<0.001	<0.001
Tetrachloroethene	1 / 15	0.001 - 0.001	0.0012 - 0.0012	0.00055	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0012	<0.001
Toluene	12 / 15	0.001 - 0.001	0.0011 - 0.0043	0.0023	<0.001	<0.001	<0.001	0.0043	0.0043	0.0024	0.0034	0.0017
Trichloroethene	11 / 15	0.001 - 0.001	0.001 - 0.0029	0.0013	<0.001	0.0023	<0.001	0.001	0.001	0.0015	0.0029	<0.001
Vinyl chloride	10 / 15	0.001 - 0.001	0.001 - 0.0021	0.0012	<0.001	<0.001	<0.001	0.0015	0.0013	0.0013	0.0021	<0.001
Xylene, M&P-	5 / 15	0.002 - 0.002	0.002 - 0.0028	0.0015	<0.002	<0.002	<0.002	0.0026	0.0024	<0.002	0.002	<0.002
Xylene, O-	3 / 15	0.001 - 0.001	0.001 - 0.0012	0.00062	<0.001	<0.001	<0.001	0.0011	0.001	<0.001	<0.001	<0.001
Xylenes, Total	15 / 15		0.003 - 0.004	0.0031	0.003	0.003	0.003	0.0037	0.0034	0.003	0.003	0.003
Semivolatile Organics (mg/L)												
Benzo(a)anthracene	1 / 15	0.0002 - 0.0002	0.0002 - 0.0002	0.00011	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002
Benzo(a)pyrene	1 / 15	0.0002 - 0.0002	0.00024 - 0.00024	0.00011	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.00024	<0.0002
Benzo(g,h,i)perylene	1 / 15	0.0002 - 0.0002	0.00038 - 0.00038	0.00012	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.00038	<0.0002
Chrysene	1 / 15	0.0002 - 0.0002	0.00023 - 0.00023	0.00011	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.00023	<0.0002
Dibenz(a,h)anthracene	1 / 15	0.0002 - 0.0002	0.00031 - 0.00031	0.00011	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.00031	<0.0002
Naphthalene	4 / 15	0.0002 - 0.0002	0.0002 - 0.0003	0.00014	<0.0002	<0.0002	<0.0002	<0.0002	0.00026	<0.0002	<0.0002	<0.0002
Pesticides/PCBs (mg/L)												
4,4'-DDT	1 / 3	0.000050 - 0.000050	0.000080 - 0.000080	0.000043		0.00008					<0.00005	
Metals, Total (mg/L)												
Chromium	3 / 15	0.02 - 0.02	0.034 - 0.06	0.017	<0.02	<0.02	<0.02	<0.02	<0.02	0.06	<0.02	<0.02
Copper	5 / 15	0.02 - 0.02	0.023 - 0.126	0.030	<0.02	<0.02	<0.02	<0.02	<0.02	0.099	0.029	<0.02
Lead	5 / 15	0.005 - 0.005	0.0083 - 0.0318	0.0089	<0.005	<0.005	<0.005	<0.005	<0.005	0.0318	0.0121	<0.005
Silver	3 / 15	0.005 - 0.005	0.005 - 0.008	0.0033	<0.005	<0.005	<0.005	<0.005	<0.005	0.008	<0.005	<0.005
Zinc	4 / 15	0.05 - 0.05	0.068 - 0.146	0.046	<0.05	<0.05	<0.05	<0.05	<0.05	0.107	0.068	<0.05
Inorganics (mg/L)												
Hardness	15 / 15		67 - 87.3	78	70.8	71.9	67	78.4	73.6	87.3	76.1	77.3
Dioxins/Furans (mg/L)												
1,2,3,4,6,7,8-HpCDD	3 / 3		2.4E-08 - 4.3E-08	0.000000037		0.000000024					0.000000043	
1,2,3,6,7,8-HxCDD	1 / 3	0.00000001 - 1E-08	1.3E-08 - 1.3E-08	0.0000000077		<0.00000001					<0.00000001	
1,2,3,7,8,9-HxCDD	1 / 3	0.00000001 - 1E-08	5.1E-08 - 5.1E-08	0.000000020		<0.00000001					<0.00000001	
1,2,3,7,8-PeCDD	1 / 3	0.00000001 - 1E-08	4.6E-08 - 4.6E-08	0.000000019		<0.00000001					<0.00000001	
2,3,7,8-TCDD	1 / 3	2E-09 - 2.1E-09	3.1E-09 - 3.1E-09	0.0000000017		<0.0000000021					<0.000000002	
2,3,7,8-TCDF	1 / 3	2E-09 - 2.1E-09	8.9E-09 - 8.9E-09	0.0000000037		<0.0000000021					<0.000000002	
OCDD	3 / 3		0.00000018 - 3.5E-07	0.00000028		0.00000018					0.00000032	
Total HpCDD	3 / 3		4.3E-08 - 7.2E-08	0.000000059		0.000000043					0.000000072	
Total HpCDF	3 / 3		1.2E-08 - 2.1E-08	0.000000015		0.000000012					0.000000021	
Total HxCDD	1 / 3	0.00000001 - 1E-08	6.4E-08 - 6.4E-08	0.000000025		<0.00000001					<0.00000001	
Total PeCDD	1 / 3	0.00000001 - 1E-08	4.6E-08 - 4.6E-08	0.000000019		<0.00000001					<0.00000001	
Total PeCDF	1 / 3	0.00000001 - 1E-08	2.9E-08 - 2.9E-08	0.000000013		<0.00000001					<0.00000001	
Total TCDD	1 / 3	2E-09 - 2.1E-09	3.1E-09 - 3.1E-09	0.000000002		<0.0000000021					<0.000000002	
Total TCDF	2 / 3	2.1E-09 - 2.1E-09	3.4E-09 - 3.2E-08	0.0000000122		<0.0000000021					0.0000000034	
TEQ-Mammal	3 / 3		1.2764E-08 - 6.221E-08	0.000000029		0.000000013					0.000000013	

< - Compound not detected, value is detection limit.
mg/L milligrams per liter

Table 1
Surface Water Data - Detected Parameters
Supplemental Site Investigation Report
Former Gorham Manufacturing Site
333 Adelaide Avenue
Providence, Rhode Island

Parameter	SW21 SW21 6/21/2006	SW22 SW22 6/21/2006	SW23 SW23 6/21/2006	SW24 SW24 6/21/2006	SW25 SW25 6/22/2006	SW26 SW26 6/21/2006	SW27 SW27 6/22/2006
Volatile Organics (mg/L)							
1,1,1-Trichloroethane	0.0012	0.001	0.001	0.0013	0.0018	0.0015	0.0018
1,1-Dichloroethane	<0.001	<0.001	<0.001	<0.001	0.0012	<0.001	0.0013
1,2,4-Trimethylbenzene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0011
cis-1,2-Dichloroethene	0.0054	0.0044	0.0044	0.0059	0.0045	0.0025	0.0054
Ethylbenzene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001
Tetrachloroethene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Toluene	0.0011	0.0014	0.0019	0.0029	0.0033	0.0015	0.0041
Trichloroethene	0.0016	0.0013	0.0017	0.0014	0.0012	<0.001	0.0014
Vinyl chloride	0.0013	0.0011	0.001	0.0018	0.0015	<0.001	0.002
Xylene, M&P-	<0.002	<0.002	<0.002	<0.002	0.0023	<0.002	0.0028
Xylene, O-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0012
Xylenes, Total	0.003	0.003	0.003	0.003	0.003	0.003	0.004
Semivolatile Organics (mg/L)							
Benzo(a)anthracene	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Benzo(a)pyrene	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Benzo(g,h,i)perylene	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Chrysene	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Dibenz(a,h)anthracene	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Naphthalene	<0.0002	<0.0002	0.0002	0.0003	0.00024	<0.0002	<0.0002
Pesticides/PCBs (mg/L)							
4,4'-DDT							<0.00005
Metals, Total (mg/L)							
Chromium	0.034	0.046	<0.02	<0.02	<0.02	<0.02	<0.02
Copper	0.071	0.126	0.023	<0.02	<0.02	<0.02	<0.02
Lead	0.0258	0.0309	0.0083	<0.005	<0.005	<0.005	<0.005
Silver	0.005	0.006	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	0.089	0.146	<0.05	<0.05	<0.05	<0.05	<0.05
Inorganics (mg/L)							
Hardness	86.7	86.7	86.6	83.4	77.7	73.7	80
Dioxins/Furans (mg/L)							
1,2,3,4,6,7,8-HpCDD							0.000000043
1,2,3,6,7,8-HxCDD							0.000000013
1,2,3,7,8,9-HxCDD							0.000000051
1,2,3,7,8-PeCDD							0.000000046
2,3,7,8-TCDD							0.0000000031
2,3,7,8-TCDF							0.0000000089
OCDD							0.00000035
Total HpCDD							0.000000061
Total HpCDF							0.000000013
Total HxCDD							0.000000064
Total PeCDD							0.000000046
Total PeCDF							0.000000029
Total TCDD							0.0000000031
Total TCDF							0.000000032
TEQ-Mammal							0.000000062

< - Compound not detected, value is detection limit.
mg/L milligrams per liter

Table 2
Sediment Data - Detected Parameters (0-2 ft)
Supplemental Site Investigation Report
Former Gorham Manufacturing Site
333 Adelaide Avenue
Providence, Rhode Island

chemical_name	Frequency of Detection	Range of Non Detects	Range of Detected Concentrations	Average of Samples	SD-1001 SD-1001 12/28/2005 0-2	SD-1002 SD-1002 12/28/2005 0-2	SD-1003 SD-1003 12/28/2005 0-2	SD-1004 SD-1004 12/28/2005 0-2	SD-1005 SD-1005 12/28/2005 0-2	SED10 SED1001 6/22/2006 0_5-1	SED11 SED1101 6/22/2006 0-1
Volatile Organics (mg/kg)											
1,1,1-Trichloroethane	5 / 28	0.004 - 0.15	0.3 - 1.3	0.15	< 0.013	< 0.0098	< 0.15	1.3	0.3	< 0.004	< 0.0427
1,1-Dichloroethane	9 / 28	0.004 - 1.1	0.011 - 7.92	0.64	< 0.013	< 0.0098	1.4	< 1.1	< 0.012	< 0.004	< 0.0427
1,1-Dichloroethene	5 / 28	0.004 - 1.1	0.014 - 11.3	0.52	< 0.013	< 0.0098	< 0.15	< 1.1	0.014	< 0.004	< 0.0427
Acetone	14 / 28	0.039 - 4.6	0.0757 - 1.9	0.32	< 0.052	< 0.039	0.87	< 4.6	< 0.048	< 0.0403	0.649
Carbon Disulfide	6 / 28	0.004 - 1.1	0.0046 - 0.0576	0.033	< 0.013	< 0.0098	< 0.15	< 1.1	< 0.012	< 0.004	< 0.0427
cis-1,2-Dichloroethene	9 / 28	0.004 - 1.1	0.0091 - 175	10.8	< 0.013	< 0.0098	0.42	< 1.1	0.016	< 0.004	< 0.0427
Isopropyl Benzene	1 / 28	0.004 - 1.1	0.0514 - 0.0514	0.030	< 0.013	< 0.0098	< 0.15	< 1.1	< 0.012	< 0.004	< 0.0427
s-Butylbenzene	2 / 28	0.004 - 1.1	0.0197 - 0.0303	0.030	< 0.013	< 0.0098	< 0.15	< 1.1	< 0.012	< 0.004	< 0.0427
Tetrachloroethene	4 / 28	0.004 - 1.1	0.0081 - 18.1	0.71	< 0.013	< 0.0098	< 0.15	< 1.1	< 0.012	< 0.004	< 0.0427
Toluene	1 / 28	0.004 - 1.1	1.92 - 1.92	0.097	< 0.013	< 0.0098	< 0.15	< 1.1	< 0.012	< 0.004	< 0.0427
trans-1,2-Dichloroethene	3 / 28	0.004 - 1.1	0.0053 - 3.62	0.26	< 0.013	< 0.0098	< 0.15	< 1.1	< 0.012	< 0.004	< 0.0427
Trichloroethene	9 / 28	0.004 - 0.15	0.176 - 58.4	3.0	< 0.013	< 0.0098	< 0.15	5.6	0.21	< 0.004	< 0.0427
Vinyl chloride	7 / 28	0.0081 - 2.3	0.0218 - 24.8	1.7	< 0.026	< 0.02	5	< 2.3	< 0.024	< 0.0081	< 0.0855
Semivolatile Organics (mg/kg)											
Acenaphthene	6 / 28	0.03 - 0.183	0.024 - 0.26	0.062	0.25	0.26	< 0.039	< 0.03	0.024	< 0.0305	< 0.163
Acenaphthylene	3 / 28	0.0079 - 0.183	0.026 - 0.781	0.064	0.07	0.026	< 0.039	< 0.03	< 0.0079	< 0.0305	< 0.163
Anthracene	13 / 28	0.0305 - 0.183	0.04 - 3.09	0.24	0.83	0.36	0.11	0.04	0.079	< 0.0305	< 0.163
Benzo(a)anthracene	18 / 28	0.0305 - 0.183	0.0896 - 15.1	0.87	2	0.69	0.29	0.16	0.15	< 0.0305	< 0.163
Benzo(a)pyrene	17 / 28	0.0305 - 0.183	0.0707 - 7.87	0.57	1.8	0.59	0.24	0.15	0.12	< 0.0305	< 0.163
Benzo(b)fluoranthene	21 / 28	0.0305 - 0.183	0.0378 - 14.8	1.0	2.9	0.86	0.34	0.25	0.17	< 0.0305	0.245
Benzo(g,h,i)perylene	14 / 28	0.0305 - 0.183	0.046 - 2.54	0.21	0.73	0.26	0.11	0.088	0.046	< 0.0305	< 0.163
Benzo(k)fluoranthene	12 / 28	0.0305 - 0.183	0.065 - 5.1	0.35	0.97	0.25	0.18	0.11	0.065	< 0.0305	< 0.163
Chrysene	17 / 28	0.0305 - 0.183	0.0896 - 8.94	0.66	2.4	0.84	0.43	0.24	0.16	< 0.0305	< 0.163
Dibenzo(a,h)anthracene	6 / 28	0.0079 - 0.183	0.0404 - 1.45	0.099	0.22	< 0.013	< 0.039	< 0.03	< 0.0079	< 0.0305	< 0.163
Di-n-butylphthalate	2 / 5	0.2 - 0.74	0.48 - 1.1	0.44	0.48	< 0.33	1.1	< 0.74	< 0.2		
Fluoranthene	23 / 28	0.0305 - 0.035	0.0833 - 28.8	1.8	4.3	1.6	0.71	0.45	0.39	< 0.0305	0.327
Fluorene	9 / 28	0.018 - 0.183	0.022 - 0.863	0.082	< 0.018	0.022	0.081	0.036	0.025	< 0.0305	< 0.163
Indeno(1,2,3-cd)pyrene	13 / 28	0.03 - 0.183	0.046 - 2.47	0.21	0.74	0.22	0.11	< 0.03	0.046	< 0.0305	< 0.163
Naphthalene	5 / 28	0.03 - 0.183	0.0342 - 0.28	0.054	0.21	0.28	< 0.039	< 0.03	0.045	< 0.0305	< 0.163
Phenanthrene	19 / 28	0.0305 - 0.183	0.0333 - 11.8	1.0	4	2.1	0.48	0.23	0.41	< 0.0305	< 0.163
Pyrene	22 / 28	0.0305 - 0.0794	0.0513 - 15.2	1.2	5.3	2.3	0.76	0.45	0.4	< 0.0305	0.258
Pesticides/PCBs (mg/kg)											
4,4'-DDD	3 / 28	0.0008 - 0.0481	0.0214 - 0.0301	0.010	< 0.0017	< 0.0013	< 0.004	< 0.003	< 0.00081	< 0.0056	< 0.0351
4,4'-DDE	1 / 28	0.0008 - 0.0481	0.0109 - 0.0109	0.0084	< 0.0017	< 0.0013	< 0.004	< 0.003	< 0.00081	< 0.0056	< 0.0351
4,4'-DDT	1 / 28	0.0008 - 0.0481	0.0635 - 0.0635	0.010	< 0.0017	< 0.0013	< 0.004	< 0.003	< 0.00081	< 0.0056	< 0.0351
Endrin ketone	1 / 28	0.0008 - 0.0481	0.0431 - 0.0431	0.0092	< 0.0017	< 0.0013	< 0.004	< 0.003	< 0.00081	< 0.0056	< 0.0351
Aroclor-1254	2 / 28	0.016 - 0.404	0.207 - 0.528	0.092	< 0.034	< 0.066	< 0.04	< 0.03	< 0.016	< 0.056	< 0.351
Aroclor-1260	1 / 28	0.016 - 0.404	0.605 - 0.605	0.086	< 0.034	< 0.066	< 0.04	< 0.03	< 0.016	< 0.056	< 0.351
Inorganics (mg/kg)											
Antimony	2 / 28	0.54 - 25.7	1.6 - 2.7	6.0	2.7	1.6	< 2.7	< 2	< 0.54	< 6.5	< 25.7
Arsenic	22 / 28	0.3 - 3	2.1 - 47.6	16.8	19	12	45	32	3.8	< 0.3	4.8
Barium	28 / 28		9.7 - 466	123	190	76	250	69	19	10.2	156
Beryllium	22 / 28	0.07 - 0.13	0.075 - 3.5	0.55	1.1	0.46	1.4	3.5	0.075	< 0.07	0.47
Cadmium	20 / 28	0.65 - 1.31	0.14 - 7.11	2.6	1.8	0.91	4.1	3.2	0.14	< 0.65	3.24

Table 2
Sediment Data - Detected Parameters (0-2 ft)
Supplemental Site Investigation Report
Former Gorham Manufacturing Site
333 Adelaide Avenue
Providence, Rhode Island

chemical_name	Frequency of Detection	Range of Non Detects	Range of Detected Concentrations	Average of Samples	SD-1001 SD-1001 12/28/2005 0-2	SD-1002 SD-1002 12/28/2005 0-2	SD-1003 SD-1003 12/28/2005 0-2	SD-1004 SD-1004 12/28/2005 0-2	SD-1005 SD-1005 12/28/2005 0-2	SED10 SED1001 6/22/2006 0_5-1	SED11 SED1101 6/22/2006 0-1
Chromium	28 / 28		2.9 - 640	192	71	12	100	59	4.8	3	213
Copper	28 / 28		4.1 - 2670	955	1200	180	740	1500	19	4.1	423
Lead	24 / 28	6.5 - 7.4	12.2 - 1120	364	340	140	590	140	23	< 6.5	590
Mercury	17 / 28	0.035 - 0.208	0.031 - 2.52	0.40	0.3	0.087	1.3	0.2	0.031	< 0.035	< 0.208
Nickel	25 / 28	3.7 - 6.6	3.6 - 853	132	48	20	120	810	10	3.6	85.7
Selenium	3 / 28	0.54 - 25.7	1.8 - 17.9	6.5	3.2	1.8	< 2.7	< 2	< 0.54	< 6.5	< 25.7
Silver	22 / 28	0.65 - 1.31	2.77 - 227	67.4	120	15	95	24	2.9	< 0.65	29.7
Zinc	28 / 28		9.5 - 1940	783	570	200	770	1200	34	28.1	620
Total Organic Carbon (TOC)	23 / 23		780 - 115000	31334						780	65000
TPH (mg/kg)											
Total Petroleum Hydrocarbons (TPH)	19 / 28	42.6 - 291	57.8 - 2600	543	1900	2600	1700	740	370	< 42.6	< 253
Dioxins/Furans (mg/kg)											
1,2,3,4,6,7,8-HpCDD	25 / 28	7E-07 - 8E-07	2E-06 - 0.0006	0.000151	0.00011	0.000059	0.00013	0.00014	0.000017	< 0.00000075	0.00028
1,2,3,4,6,7,8-HpCDF	24 / 28	7E-07 - 8E-07	2E-06 - 0.001	0.00021	0.000092	0.00016	0.00027	0.00021	0.00003	< 0.00000075	0.00014
1,2,3,4,7,8,9-HpCDF	22 / 28	7E-07 - 1E-06	1E-06 - 0.0002	0.000038	0.0000099	0.000014	0.000049	0.000047	0.0000041	< 0.00000075	0.000018
1,2,3,4,7,8-HxCDD	17 / 28	7E-07 - 2E-05	1E-06 - 7E-05	0.0000144	0.0000049	0.0000061	0.000016	< 0.000014	< 0.0000018	< 0.00000075	0.0000095
1,2,3,4,7,8-HxCDF	22 / 28	7E-07 - 2E-06	2E-06 - 0.0007	0.000120	0.00003	0.000057	0.00017	0.00011	0.000017	< 0.00000075	0.000036
1,2,3,6,7,8-HxCDD	23 / 28	7E-07 - 8E-07	1E-06 - 0.0002	0.000040	0.000013	0.000012	0.000042	0.000039	0.0000047	< 0.00000075	0.000025
1,2,3,6,7,8-HxCDF	22 / 28	7E-07 - 1E-06	7E-06 - 0.0013	0.00020	0.000037	0.000059	0.00023	0.00026	0.000033	< 0.00000075	0.000086
1,2,3,7,8,9-HxCDD	20 / 28	7E-07 - 2E-05	2E-06 - 1E-04	0.000020	0.0000082	0.000008	0.000021	0.00002	< 0.0000027	< 0.00000075	0.000017
1,2,3,7,8,9-HxCDF	18 / 28	7E-07 - 7E-06	2E-06 - 0.0004	0.0000733	< 0.0000031	< 0.0000028	0.0000086	< 0.0000071	< 0.00000091	< 0.00000075	0.00003
1,2,3,7,8-PeCDD	21 / 28	7E-07 - 3E-06	1E-06 - 0.0001	0.000026	0.0000097	0.0000074	0.000031	0.000033	< 0.000003	< 0.00000075	0.000011
1,2,3,7,8-PeCDF	13 / 28	7E-07 - 2E-05	2E-06 - 0.0002	0.000020	0.000016	0.000028	0.00006	0.000055	0.0000083	< 0.00000075	0.000032
2,3,4,6,7,8-HxCDF	22 / 28	7E-07 - 1E-06	1E-05 - 0.0009	0.00017	0.000036	0.000051	0.00018	0.00022	0.000028	< 0.00000075	0.00008
2,3,4,7,8-PeCDF	25 / 28	7E-07 - 8E-07	7E-07 - 0.0062	0.000834	0.000036	0.000043	0.00016	0.00017	0.000023	< 0.00000075	0.00043
2,3,7,8-TCDD	21 / 28	1E-07 - 3E-07	5E-07 - 3E-05	0.0000075	0.0000053	0.0000025	0.0000095	0.0000092	0.00000098	< 0.00000015	0.0000042
2,3,7,8-TCDF	20 / 28	1E-07 - 4E-06	2E-07 - 0.0001	0.000023	0.000018	0.000015	0.000027	0.000029	0.0000043	< 0.00000015	< 0.00000057
OCDD	28 / 28		4E-06 - 0.0029	0.00074	0.00075	0.00024	0.00042	0.00048	0.000077	0.0000044	0.0018
OCDF	25 / 28	1E-06 - 2E-06	2E-06 - 0.0003	0.00009	0.000075	0.00019	0.00019	0.00007	0.0000076	< 0.0000015	0.000087
TOTAL HpCDD	25 / 28	7E-07 - 8E-07	4E-06 - 0.0013	0.00031	0.0002	0.00012	0.00027	0.00026	0.000036	< 0.00000075	0.00063
TOTAL HpCDF	25 / 28	7E-07 - 8E-07	1E-06 - 0.0028	0.00054	0.00018	0.00024	0.00062	0.00055	0.000073	< 0.00000075	0.00033
TOTAL HxCDD	24 / 28	7E-07 - 8E-07	1E-06 - 0.0026	0.00051	0.00012	0.00013	0.00049	0.00042	0.000048	< 0.00000075	0.0003
TOTAL HxCDF	27 / 28	8E-07 - 8E-07	1E-06 - 0.025	0.0050	0.00078	0.001	0.0055	0.0058	0.00079	< 0.00000075	0.0023
TOTAL PeCDD	23 / 28	7E-07 - 8E-07	8E-06 - 0.002	0.00037	0.000074	0.000056	0.00031	0.00029	0.000022	< 0.00000075	0.00014
TOTAL PeCDF	27 / 28	8E-07 - 8E-07	3E-06 - 0.04	0.0061	0.00068	0.00088	0.0051	0.0054	0.00075	< 0.00000075	0.0055
TOTAL TCDD	24 / 28	1E-07 - 2E-07	3E-07 - 0.0008	0.000162	0.000077	0.000045	0.00012	0.00011	0.000011	< 0.00000015	0.000089
TOTAL TCDF	27 / 28	2E-07 - 2E-07	1E-06 - 0.015	0.00270	0.00029	0.00029	0.0013	0.0013	0.00017	< 0.00000015	0.0016

< - Compound not detected, value is detection limit.
mg/kg - milligrams per kilogram

Table 2
Sediment Data - Detected Parameters (0-2 ft)
Supplemental Site Investigation Report
Former Gorham Manufacturing Site
333 Adelaide Avenue
Providence, Rhode Island

chemical_name	SED12 SED1201 6/22/2006 0_5-1	SED13 SED1301 6/22/2006 0-0_5	SED14 SED1401 6/22/2006 0-1	SED15 SED1501 6/22/2006 0-1	SED16 SED1601 6/22/2006 0-1	SED17 SED1701 6/22/2006 0_5-1	SED18 SED1801 6/22/2006 0-1	SED19 SED1901 6/22/2006 0-1	SED20 SED2001 6/22/2006 0_5-1	SED21 SED2101 6/22/2006 0-1	SED22 SED2201 6/22/2006 0-1	SED23 SED2301 6/22/2006 0-1
Volatile Organics (mg/kg)												
1,1,1-Trichloroethane	< 0.006	< 0.0045	< 0.012	0.863	< 0.0235	0.732	< 0.0506	0.635	< 0.0149	< 0.0044	< 0.0126	< 0.0041
1,1-Dichloroethane	< 0.006	< 0.0045	< 0.012	0.0518	< 0.0235	0.137	< 0.0506	7.92	< 0.0149	< 0.0044	< 0.0126	< 0.0041
1,1-Dichloroethene	< 0.006	< 0.0045	< 0.012	0.0467	< 0.0235	0.0555	< 0.0506	11.3	< 0.0149	< 0.0044	< 0.0126	< 0.0041
Acetone	0.0757	0.105	0.202	< 0.0461	< 0.235	< 0.0463	1.9	0.242	0.421	< 0.0445	0.294	< 0.0406
Carbon Disulfide	< 0.006	0.0046	< 0.012	0.021	< 0.0235	0.007	< 0.0506	0.0576	< 0.0149	< 0.0044	< 0.0126	< 0.0041
cis-1,2-Dichloroethene	< 0.006	< 0.0045	< 0.012	0.296	< 0.0235	0.0298	< 0.0506	175	< 0.0149	< 0.0044	< 0.0126	0.0091
Isopropyl Benzene	< 0.006	< 0.0045	< 0.012	< 0.0046	< 0.0235	< 0.0046	< 0.0506	< 0.017	< 0.0149	< 0.0044	< 0.0126	< 0.0041
s-Butylbenzene	< 0.006	< 0.0045	< 0.012	< 0.0046	< 0.0235	< 0.0046	< 0.0506	0.0197	< 0.0149	< 0.0044	< 0.0126	< 0.0041
Tetrachloroethene	< 0.006	< 0.0045	< 0.012	0.0161	< 0.0235	0.0081	< 0.0506	18.1	< 0.0149	< 0.0044	< 0.0126	1.04
Toluene	< 0.006	< 0.0045	< 0.012	< 0.0046	< 0.0235	< 0.0046	< 0.0506	< 0.017	< 0.0149	< 0.0044	< 0.0126	< 0.0041
trans-1,2-Dichloroethene	< 0.006	< 0.0045	< 0.012	0.0053	< 0.0235	< 0.0046	< 0.0506	2.79	< 0.0149	< 0.0044	< 0.0126	< 0.0041
Trichloroethene	< 0.006	< 0.0045	< 0.012	1.47	< 0.0235	1.22	< 0.0506	58.4	< 0.0149	< 0.0044	< 0.0126	0.176
Vinyl chloride	< 0.0121	< 0.0089	< 0.024	< 0.0092	< 0.047	< 0.0093	< 0.101	0.148	< 0.0298	< 0.0089	< 0.0253	< 0.0081
Semivolatile Organics (mg/kg)												
Acenaphthene	0.0564	< 0.0321	< 0.0943	< 0.0315	< 0.179	< 0.035	< 0.183	< 0.124	0.153	< 0.0328	< 0.0794	< 0.0322
Acenaphthylene	< 0.0553	< 0.0321	< 0.0943	< 0.0315	< 0.179	< 0.035	< 0.183	< 0.124	0.781	< 0.0328	< 0.0794	< 0.0322
Anthracene	0.276	< 0.0321	< 0.0943	< 0.0315	< 0.179	< 0.035	< 0.183	< 0.124	3.09	< 0.0328	< 0.0794	< 0.0322
Benzo(a)anthracene	0.685	< 0.0321	< 0.0943	< 0.0315	< 0.179	< 0.035	< 0.183	0.218	15.1	< 0.0328	0.108	< 0.0322
Benzo(a)pyrene	0.862	< 0.0321	< 0.0943	< 0.0315	< 0.179	< 0.035	< 0.183	0.151	7.87	< 0.0328	0.102	< 0.0322
Benzo(b)fluoranthene	1.41	0.0378	< 0.0943	< 0.0315	0.201	< 0.035	< 0.183	0.32	14.8	< 0.0328	0.114	< 0.0322
Benzo(g,h,i)perylene	0.244	< 0.0321	< 0.0943	< 0.0315	< 0.179	< 0.035	< 0.183	< 0.124	2.54	< 0.0328	< 0.0794	< 0.0322
Benzo(k)fluoranthene	0.636	< 0.0321	< 0.0943	< 0.0315	< 0.179	< 0.035	< 0.183	< 0.124	5.1	< 0.0328	< 0.0794	< 0.0322
Chrysene	0.625	< 0.0321	< 0.0943	< 0.0315	< 0.179	< 0.035	< 0.183	0.201	8.94	< 0.0328	0.119	< 0.0322
Dibenzo(a,h)anthracene	0.0807	< 0.0321	< 0.0943	< 0.0315	< 0.179	< 0.035	< 0.183	< 0.124	1.45	< 0.0328	< 0.0794	< 0.0322
Di-n-butylphthalate												
Fluoranthene	1.92	0.0833	0.204	< 0.0315	0.33	< 0.035	0.267	0.533	28.8	< 0.0328	0.235	< 0.0322
Fluorene	0.107	< 0.0321	< 0.0943	< 0.0315	< 0.179	< 0.035	< 0.183	< 0.124	0.863	< 0.0328	< 0.0794	< 0.0322
Indeno(1,2,3-cd)pyrene	0.259	< 0.0321	< 0.0943	< 0.0315	< 0.179	< 0.035	< 0.183	< 0.124	2.47	< 0.0328	< 0.0794	< 0.0322
Naphthalene	< 0.0553	< 0.0321	< 0.0943	< 0.0315	< 0.179	< 0.035	< 0.183	< 0.124	< 0.0612	< 0.0328	< 0.0794	< 0.0322
Phenanthrene	1.14	0.0333	0.0999	< 0.0315	< 0.179	< 0.035	< 0.183	0.218	11.8	< 0.0328	0.121	< 0.0322
Pyrene	1.01	0.0513	0.153	< 0.0315	0.244	< 0.035	0.187	0.35	15.2	< 0.0328	< 0.0794	< 0.0322
Pesticides/PCBs (mg/kg)												
4,4'-DDD	0.0214	< 0.00631	< 0.0192	< 0.00594	< 0.0357	< 0.00671	< 0.0405	< 0.0247	0.0292	< 0.00692	< 0.0327	< 0.00685
4,4'-DDE	< 0.0112	< 0.00631	< 0.0192	< 0.00594	< 0.0357	< 0.00671	< 0.0405	< 0.0247	< 0.0112	< 0.00692	< 0.0327	< 0.00685
4,4'-DDT	< 0.0112	< 0.00631	< 0.0192	< 0.00594	< 0.0357	< 0.00671	< 0.0405	< 0.0247	< 0.0112	< 0.00692	< 0.0327	< 0.00685
Endrin ketone	< 0.0112	< 0.00631	< 0.0192	< 0.00594	< 0.0357	< 0.00671	< 0.0405	0.0431	< 0.0112	< 0.00692	< 0.0327	< 0.00685
Aroclor-1254	< 0.112	< 0.0631	< 0.192	< 0.0593	< 0.357	< 0.067	< 0.404	< 0.246	< 0.112	< 0.0691	< 0.163	< 0.0685
Aroclor-1260	< 0.112	< 0.0631	< 0.192	< 0.0593	< 0.357	< 0.067	< 0.404	0.605	< 0.112	< 0.0691	< 0.163	< 0.0685
Inorganics (mg/kg)												
Antimony	< 11.9	< 6.7	< 15.1	< 6.6	< 22.6	< 7.6	< 25.7	< 23.6	< 13.1	< 7.4	< 15.9	< 7.4
Arsenic	< 3	11.5	47.6	12.6	20	< 0.4	22.2	36	< 0.7	2.1	12	< 1.8
Barium	33.1	11.5	130	9.7	194	12.4	278	224	25.3	13	125	13.1
Beryllium	0.31	< 0.07	0.35	< 0.07	0.6	< 0.08	0.72	1.03	< 0.13	0.14	0.32	< 0.07
Cadmium	< 1.19	< 0.67	2.26	< 0.66	5.66	< 0.76	6.9	7.11	< 1.31	< 0.74	2.8	< 0.74

Table 2
Sediment Data - Detected Parameters (0-2 ft)
Supplemental Site Investigation Report
Former Gorham Manufacturing Site
333 Adelaide Avenue
Providence, Rhode Island

chemical_name	SED12 SED1201 6/22/2006 0_5-1	SED13 SED1301 6/22/2006 0-0_5	SED14 SED1401 6/22/2006 0-1	SED15 SED1501 6/22/2006 0-1	SED16 SED1601 6/22/2006 0-1	SED17 SED1701 6/22/2006 0_5-1	SED18 SED1801 6/22/2006 0-1	SED19 SED1901 6/22/2006 0-1	SED20 SED2001 6/22/2006 0_5-1	SED21 SED2101 6/22/2006 0-1	SED22 SED2201 6/22/2006 0-1	SED23 SED2301 6/22/2006 0-1
Chromium	7	4.7	49.1	2.9	565	11.1	640	387	7.5	7.1	616	333
Copper	12.5	5.3	215	5.8	2050	34.8	2590	1880	14.6	20.1	1970	8.6
Lead	20.7	< 6.7	250	< 6.6	763	20.9	961	927	34.1	12.2	426	< 7.4
Mercury	< 0.068	< 0.04	< 0.116	< 0.041	0.162	< 0.047	0.163	2.52	< 0.067	< 0.043	0.677	< 0.044
Nickel	< 5.9	22.5	31.4	6.8	130	5.7	157	433	< 6.6	6.8	86	< 3.7
Selenium	< 11.9	< 6.7	< 15.1	< 6.6	< 22.6	< 7.6	< 25.7	< 23.6	< 13.1	< 7.4	< 15.9	< 7.4
Silver	< 1.19	< 0.67	18.5	< 0.66	164	5.27	227	192	< 1.31	2.77	163	< 0.74
Zinc	34.7	41.4	363	12.6	1630	39.3	1940	1830	38.8	71.6	1360	9.5
Total Organic Carbon (TOC)	2300	2700	31000	7000	73000	5800	115000	69600	26000	5300	24000	2800
TPH (mg/kg)												
Total Petroleum Hydrocarbons (TPH)	< 85	< 48.1	< 147	< 44.9	< 275	83.4	< 291	756	1810	57.8	190	< 50.1
Dioxins/Furans (mg/kg)												
1,2,3,4,6,7,8-HpCDD	0.0000074	0.0000022	0.000071	< 0.0000008	0.00048	0.000021	0.00064	0.00027	0.00009	0.0000045	0.00011	< 0.00000068
1,2,3,4,6,7,8-HpCDF	0.000002	< 0.00000076	0.000037	< 0.0000008	0.00057	0.000035	0.001	0.00051	0.0002	0.0000065	0.00016	< 0.00000068
1,2,3,4,7,8,9-HpCDF	< 0.00000071	< 0.00000076	0.0000044	< 0.0000008	0.000092	0.0000065	0.00017	0.00011	0.000041	0.0000012	0.000025	< 0.00000068
1,2,3,4,7,8-HxCDD	< 0.00000071	< 0.00000076	0.0000033	< 0.0000008	0.000041	0.0000022	0.000074	0.000051	0.000015	< 0.00000084	< 0.000018	< 0.00000068
1,2,3,4,7,8-HxCDF	< 0.00000071	< 0.00000076	< 0.0000017	< 0.0000008	0.00033	0.000017	0.00067	0.00039	0.00014	0.0000034	0.000068	< 0.00000068
1,2,3,6,7,8-HxCDD	< 0.00000071	< 0.00000076	0.0000068	< 0.0000008	0.00012	0.0000057	0.00019	0.00012	0.000035	0.0000013	0.000028	< 0.00000068
1,2,3,6,7,8-HxCDF	< 0.00000071	< 0.00000076	0.000026	< 0.0000008	0.00057	0.00003	0.0013	0.00062	0.00014	0.0000073	0.00016	< 0.00000068
1,2,3,7,8,9-HxCDD	< 0.00000071	< 0.00000076	0.0000034	< 0.0000008	0.000056	0.0000033	0.000097	0.000059	0.000016	< 0.00000084	< 0.000018	< 0.00000068
1,2,3,7,8,9-HxCDF	< 0.00000071	< 0.00000076	0.0000084	< 0.0000008	0.00019	0.000013	0.00039	0.00025	0.000052	0.0000024	0.000062	< 0.00000068
1,2,3,7,8-PeCDD	< 0.00000071	< 0.00000076	0.0000048	< 0.0000008	0.000056	0.0000033	0.000098	0.000069	0.00003	0.00000095	0.000018	< 0.00000068
1,2,3,7,8-PeCDF	< 0.00000071	< 0.00000076	0.0000084	< 0.0000008	< 0.0000034	0.0000081	< 0.0000032	< 0.0000027	< 0.0000012	0.0000023	0.000041	< 0.00000068
2,3,4,6,7,8-HxCDF	< 0.00000071	< 0.00000076	0.000051	< 0.0000008	0.0004	0.000075	0.00091	0.00054	0.00012	0.000016	0.00015	< 0.00000068
2,3,4,7,8-PeCDF	0.00000073	0.00000086	0.00015	< 0.0000008	0.0028	0.00019	0.0062	0.0035	0.00014	0.000044	0.0013	< 0.00000068
2,3,7,8-TCDD	< 0.00000014	< 0.00000015	0.0000014	< 0.00000016	0.000016	0.0000011	0.00003	0.000021	0.0000073	< 0.00000017	0.0000068	< 0.00000014
2,3,7,8-TCDF	0.00000024	0.00000019	0.0000076	< 0.00000016	0.000082	< 0.00000014	0.00012	0.000058	0.0000093	< 0.00000017	0.000027	< 0.00000014
OCDD	0.000064	0.000016	0.00047	0.0000044	0.0023	0.00007	0.0027	0.00093	0.00024	0.000025	0.0005	0.0000035
OCDF	0.0000031	0.0000016	0.000036	< 0.0000016	0.00025	0.000008	0.0003	0.0001	0.000082	0.0000022	0.000044	< 0.0000014
TOTAL HpCDD	0.000013	0.0000039	0.00014	< 0.0000008	0.00097	0.000044	0.0013	0.00058	0.00019	0.0000088	0.00024	< 0.00000068
TOTAL HpCDF	0.000002	0.0000011	0.000089	< 0.0000008	0.0014	0.000087	0.0028	0.0014	0.0005	0.000017	0.00042	< 0.00000068
TOTAL HxCDD	0.0000011	< 0.00000076	0.000087	< 0.0000008	0.0014	0.00007	0.0026	0.0016	0.00047	0.000013	0.00031	< 0.00000068
TOTAL HxCDF	0.0000039	0.000003	0.00051	0.0000011	0.016	0.0009	0.023	0.012	0.0046	0.0002	0.0055	0.0000017
TOTAL PeCDD	< 0.00000071	< 0.00000076	0.000047	< 0.0000008	0.001	0.000041	0.002	0.0014	0.00039	0.0000081	0.0002	< 0.00000068
TOTAL PeCDF	0.0000056	0.0000074	0.0013	0.0000031	0.0073	0.0021	0.0096	0.0088	0.0069	0.00046	0.014	0.0000044
TOTAL TCDD	0.00000031	< 0.00000015	0.000029	< 0.00000016	0.00038	0.000023	0.0008	0.00051	0.00016	0.0000036	0.00015	< 0.00000014
TOTAL TCDF	0.0000037	0.0000031	0.00042	0.0000013	0.0069	0.0006	0.012	0.0065	0.0014	0.00014	0.0045	0.0000012

< - Compound not detected, value is detection limit.
mg/kg - milligrams per kilogram

Table 2
Sediment Data - Detected Parameters (0-2 ft)
Supplemental Site Investigation Report
Former Gorham Manufacturing Site
333 Adelaide Avenue
Providence, Rhode Island

chemical_name	SED24 SED2401 6/22/2006 0-1	SED25 SED2501 6/22/2006 0-1	SED26 SED2601 6/22/2006 0-1	SED27 SED2701 6/22/2006 0-1	SED28 SED2801 6/21/2006 0_5-1	SED29 SED2901 6/21/2006 0_5-1	SED30 SED3001 6/21/2006 0_5-1	SED31 SED3101 6/21/2006 0_5-1	SED32 SED3201 6/21/2006 0_5-1
Volatile Organics (mg/kg)									
1,1,1-Trichloroethane	< 0.0079	< 0.0088	< 0.008	< 0.0198	< 0.0226	< 0.025	< 0.0043	< 0.0289	< 0.005
1,1-Dichloroethane	0.011	1.09	< 0.008	4.67	0.0266	< 0.025	< 0.0043	1.92	< 0.005
1,1-Dichloroethene	< 0.0079	< 0.0088	< 0.008	2.34	< 0.0226	< 0.025	< 0.0043	< 0.0289	< 0.005
Acetone	< 0.0791	0.128	0.0856	< 0.198	0.384	0.27	< 0.0434	0.522	< 0.0496
Carbon Disulfide	< 0.0079	0.0111	< 0.008	0.0398	< 0.0226	< 0.025	< 0.0043	< 0.0289	< 0.005
cis-1,2-Dichloroethene	< 0.0079	11.5	< 0.008	103	< 0.0226	< 0.025	< 0.0043	10.6	< 0.005
Isopropyl Benzene	< 0.0079	< 0.0088	< 0.008	< 0.0198	0.0514	< 0.025	< 0.0043	< 0.0289	< 0.005
s-Butylbenzene	< 0.0079	< 0.0088	< 0.008	< 0.0198	0.0303	< 0.025	< 0.0043	< 0.0289	< 0.005
Tetrachloroethene	< 0.0079	< 0.0088	< 0.008	< 0.0198	< 0.0226	< 0.025	< 0.0043	< 0.0289	< 0.005
Toluene	< 0.0079	< 0.0088	< 0.008	< 0.0198	< 0.0226	< 0.025	< 0.0043	1.92	< 0.005
trans-1,2-Dichloroethene	< 0.0079	< 0.0088	< 0.008	3.62	< 0.0226	< 0.025	< 0.0043	< 0.0289	< 0.005
Trichloroethene	< 0.0079	0.276	< 0.008	15.1	< 0.0226	< 0.025	< 0.0043	0.797	< 0.005
Vinyl chloride	0.0218	24.8	< 0.016	5.42	0.0499	< 0.05	< 0.0087	11.7	< 0.0099
Semivolatile Organics (mg/kg)									
Acenaphthene	< 0.0631	< 0.0829	< 0.0463	< 0.124	< 0.0912	< 0.101	< 0.0311	< 0.109	0.12
Acenaphthylene	< 0.0631	< 0.0829	< 0.0463	< 0.124	< 0.0912	< 0.101	< 0.0311	< 0.109	< 0.034
Anthracene	< 0.0631	0.163	< 0.0463	< 0.124	0.403	0.169	0.0852	0.171	0.438
Benzo(a)anthracene	0.0896	0.541	0.241	0.134	1.29	0.687	0.376	0.671	0.64
Benzo(a)pyrene	0.0707	0.483	0.273	< 0.124	0.993	0.543	0.239	0.503	0.497
Benzo(b)fluoranthene	0.0732	0.516	0.256	0.285	1.49	0.882	0.433	1.18	0.892
Benzo(g,h,i)perylene	< 0.0631	0.27	0.144	< 0.124	0.296	0.117	0.152	0.124	0.191
Benzo(k)fluoranthene	< 0.0631	< 0.0829	< 0.0463	< 0.124	0.668	0.396	0.137	0.326	0.43
Chrysene	0.0896	0.534	0.227	< 0.124	1.16	0.617	0.299	0.579	0.551
Dibenzo(a,h)anthracene	< 0.0631	< 0.0829	< 0.0463	< 0.124	0.0912	< 0.101	0.0404	< 0.109	0.0667
Di-n-butylphthalate									
Fluoranthene	0.211	3.17	0.419	0.354	2.31	1.34	0.535	1.51	1.56
Fluorene	< 0.0631	< 0.0829	< 0.0463	< 0.124	0.135	< 0.101	0.0802	< 0.109	0.156
Indeno(1,2,3-cd)pyrene	< 0.0631	0.27	0.133	< 0.124	0.314	0.125	0.124	0.128	0.207
Naphthalene	< 0.0631	< 0.0829	< 0.0463	< 0.124	< 0.0912	< 0.101	0.0342	< 0.109	0.0456
Phenanthrene	0.169	2.46	0.158	< 0.124	1.14	0.689	0.466	0.757	1.23
Pyrene	0.177	2.4	0.348	0.196	1.29	0.874	0.81	0.953	1.07
Pesticides/PCBs (mg/kg)									
4,4'-DDD	< 0.0229	< 0.0309	< 0.0189	< 0.0481	< 0.0193	< 0.0211	< 0.00635	< 0.0207	0.0301
4,4'-DDE	< 0.0229	< 0.0309	< 0.0189	< 0.0481	< 0.0193	< 0.0211	< 0.00635	< 0.0207	0.0109
4,4'-DDT	< 0.0229	< 0.0309	< 0.0189	< 0.0481	< 0.0193	< 0.0211	< 0.00635	< 0.0207	0.0635
Endrin ketone	< 0.0229	< 0.0309	< 0.0189	< 0.0481	< 0.0193	< 0.0211	< 0.00635	< 0.0207	< 0.00678
Aroclor-1254	0.207	< 0.168	< 0.093	< 0.245	< 0.193	< 0.21	0.528	< 0.207	< 0.0677
Aroclor-1260	< 0.125	< 0.168	< 0.093	< 0.245	< 0.193	< 0.21	< 0.0634	< 0.207	< 0.0677
Inorganics (mg/kg)									
Antimony	< 9.8	< 13.1	< 10.1	< 16.6	< 19.7	< 20.4	< 7	< 21.3	< 7.4
Arsenic	9.3	22.4	36.1	36.6	33.8	31.7	2.2	14.8	< 1.8
Barium	82.4	207	466	123	202	372	25.1	113	13.4
Beryllium	0.28	0.58	0.87	0.85	0.64	0.65	0.11	0.61	0.1
Cadmium	2.87	4.56	1.57	4.39	4.73	6.44	0.75	4.13	0.93

Table 2
Sediment Data - Detected Parameters (0-2 ft)
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Former Gorham Manufacturing Site
333 Adelaide Avenue
Providence, Rhode Island

chemical_name	SED24 SED2401 6/22/2006 0-1	SED25 SED2501 6/22/2006 0-1	SED26 SED2601 6/22/2006 0-1	SED27 SED2701 6/22/2006 0-1	SED28 SED2801 6/21/2006 0_5-1	SED29 SED2901 6/21/2006 0_5-1	SED30 SED3001 6/21/2006 0_5-1	SED31 SED3101 6/21/2006 0_5-1	SED32 SED3201 6/21/2006 0_5-1
Chromium	532	300	18.8	148	372	252	172	449	28.9
Copper	1930	1890	180	892	1930	1260	1320	1790	2670
Lead	520	672	219	507	659	772	159	1120	304
Mercury	0.653	0.159	0.637	< 0.12	1.21	1.53	0.113	1.11	0.061
Nickel	55.6	113	274	853	118	147	19.2	99.8	22.8
Selenium	< 9.8	< 13.1	17.9	< 16.6	< 19.7	< 20.4	< 7	< 21.3	< 7.4
Silver	107	140	37.9	78.3	132	130	38.4	131	30.3
Zinc	1920	1360	209	1300	1420	1480	893	1440	1110
Total Organic Carbon (TOC)	23000	46100	29600	46000	41000	45000	6700	46000	7000
TPH (mg/kg)									
Total Petroleum Hydrocarbons (TPH)	226	380	88.8	413	394	459	1240	961	209
Dioxins/Furans (mg/kg)									
1,2,3,4,6,7,8-HpCDD	0.000029	0.00032	0.00002	0.00018	0.00049	0.00018	0.000066	0.00043	0.000074
1,2,3,4,6,7,8-HpCDF	0.000029	0.00044	0.0000059	0.00023	0.00064	0.00035	0.000036	0.00071	0.00004
1,2,3,4,7,8,9-HpCDF	0.0000045	0.000079	< 0.0000014	0.000036	0.000099	0.000069	0.0000061	0.00017	0.0000051
1,2,3,4,7,8-HxCDD	0.0000013	0.00003	< 0.0000014	< 0.000021	0.000039	0.000018	0.0000034	0.000055	0.0000018
1,2,3,4,7,8-HxCDF	0.000012	0.00031	0.0000024	0.00013	0.0003	0.00021	0.000018	0.00032	0.000011
1,2,3,6,7,8-HxCDD	0.0000054	0.000083	0.0000036	0.000037	0.00011	0.00007	0.000012	0.00015	0.0000048
1,2,3,6,7,8-HxCDF	0.000016	0.00038	< 0.0000014	0.00015	0.00052	0.00029	0.000014	0.00075	0.000012
1,2,3,7,8,9-HxCDD	0.0000028	0.000038	0.0000017	0.000022	0.000068	0.000031	0.0000072	0.000078	0.0000028
1,2,3,7,8,9-HxCDF	0.000007	0.00018	< 0.0000014	0.000075	0.0002	0.00014	0.0000096	0.00042	0.0000053
1,2,3,7,8-PeCDD	0.0000024	0.000063	< 0.0000014	0.000029	0.000076	0.000041	0.0000052	0.00012	0.0000022
1,2,3,7,8-PeCDF	0.0000055	< 0.0000049	< 0.0000014	0.000035	< 0.000018	< 0.0000018	< 0.0000007	0.00023	< 0.00000073
2,3,4,6,7,8-HxCDF	0.000012	0.00031	< 0.0000014	0.00018	0.00042	0.00023	0.000013	0.00064	0.000012
2,3,4,7,8-PeCDF	0.000095	0.0022	0.0000017	0.00091	0.0031	0.00016	0.000076	0.0016	0.000028
2,3,7,8-TCDD	0.00000072	0.000018	< 0.00000028	0.0000081	0.000022	0.000012	0.00000062	0.000033	0.00000052
2,3,7,8-TCDF	< 0.00000026	0.000053	0.0000016	< 0.0000042	0.000084	0.000032	0.0000047	0.000076	0.000006
OCDD	0.00017	0.0019	0.000043	0.00083	0.0029	0.00084	0.00054	0.0016	0.00081
OCDF	0.000017	0.00017	0.0000062	0.00013	0.00021	0.00017	0.000037	0.00019	0.00008
TOTAL HpCDD	0.000058	0.00065	0.000033	0.00038	0.001	0.0004	0.00013	0.00094	0.00017
TOTAL HpCDF	0.000066	0.0011	0.0000059	0.00051	0.0016	0.00087	0.000094	0.002	0.00012
TOTAL HxCDD	0.00005	0.0011	0.000064	0.00045	0.0014	0.0009	0.00013	0.002	0.000051
TOTAL HxCDF	0.00049	0.012	0.0000054	0.0048	0.01	0.0083	0.00038	0.025	0.00032
TOTAL PeCDD	0.000029	0.00091	0.000022	0.00024	0.00095	0.00053	0.000055	0.0016	0.000025
TOTAL PeCDF	0.0011	0.012	0.0000061	0.0098	0.024	0.014	0.00059	0.04	0.0005
TOTAL TCDD	0.000017	0.0005	0.000021	0.00013	0.00042	0.00027	0.000021	0.00064	0.000012
TOTAL TCDF	0.00032	0.0069	0.000021	0.003	0.0088	0.0037	0.00017	0.015	0.00016

< - Compound not detected, value is detection limit.
mg/kg - milligrams per kilogram

Prepared by: BJR
Checked by: KJC

Table 3
Toxicity Equivalency Factors (TEFs[1]) for Dioxin and Furan Congeners
Supplemental Site Investigation Report
Former Gorham Manufacturing Site
333 Adelaide Avenue
Providence, Rhode Island

	Toxicity Equivalency Factor		
Congener	**Human/Mammal**	**Fish**	**Bird**
Dibenzo-p-dioxins			
2,3,7,8-TCDD	1	1	1
1,2,3,7,8-PnCDD	1	1	1
1,2,3,4,7,8-HxCDD	0.1	0.5	0.05
1,2,3,6,7,8-HxCDD	0.1	0.01	0.01
1,2,3,7,8,9-HxCDD	0.1	0.01	0.1
1,2,3,4,6,7,8-HpCDD	0.01	0.001	0.001
OCDD	0.0001	0.0001	0.0001
Dibenzofurans			
2,3,7,8-TCDF	0.1	0.05	1
1,2,3,7,8-PnCDF	0.05	0.05	0.1
2,3,4,7,8-PnCDF	0.5	0.5	1
1,2,3,4,7,8-HxCDF	0.1	0.1	0.1
1,2,3,6,7,8-HxCDF	0.1	0.1	0.1
1,2,3,7,8,9-HxCDF	0.1	0.1	0.1
2,3,4,6,7,8-HxCDF	0.1	0.1	0.1
1,2,3,4,6,7,8-HpCDF	0.01	0.01	0.01
1,2,3,4,7,8,9-HpCDF	0.01	0.01	0.01
OCDF	0.0001	0.0001	0.0001

Notes:

[1] TEFs are based on the conclusions of the World Health Organization meeting in Stockholm, Sweden, June 15-18 1997 (Van den Berg et al., 1998).

Van den Berg, M., Birnbaum, L., Bosveld, B.T.C., Brunström, B., Cook, P., Feeley, M., Giesy, J.P., Hanberg, A., Hasegawa, R., Kennedy, S.W., Kubiak, T., Larsen, J.C., van Leeuwen, F.X.R., Liem, A.K.D.,Nolt, C., Peterson, R.E., Poellinger, L., Safe, S., Schrenk, D., Tillitt,D., Tysklind, M., Younes, M., Waern, F.,Zacharewski, 1998. T. Toxic Equivalency Factors (TEFs) for PCBs, PCDDs, PCDFs for humans and wildlife. Environmental Health Perspective, 106 (12), 775-792.

Table 4
Calculation of Dioxin Toxic Equivalents (TEQ) for Surface Water Samples
Supplemental Site Investigation Report
Former Gorham Manufacturing Site
333 Adelaide Avenue
Providence, Rhode Island

chemical_name	TEF Humans-Mammals	SW11 SW11 6/21/2006	Sample*TEF	SW19 SW19 6/21/2006	Sample*TEF	SW27 SW27 6/22/2006	Sample*TEF
1,2,3,4,6,7,8-HpCDD	0.01	2.4E-08	2.4E-10	4.3E-08	4.3E-10	4.3E-08	4.3E-10
1,2,3,4,6,7,8-HpCDF	0.01	< 0.00000001	5E-11	< 0.00000001	5E-11	< 0.00000001	5E-11
1,2,3,4,7,8,9-HpCDF	0.01	< 0.00000001	5E-11	< 0.00000001	5E-11	< 0.00000001	5E-11
1,2,3,4,7,8-HxCDD	0.1	< 0.00000001	5E-10	< 0.00000001	5E-10	< 0.00000001	5E-10
1,2,3,4,7,8-HxCDF	0.1	< 0.00000001	5E-10	< 0.00000001	5E-10	< 0.00000001	5E-10
1,2,3,6,7,8-HxCDD	0.1	< 0.00000001	5E-10	< 0.00000001	5E-10	1.3E-08	1.3E-09
1,2,3,6,7,8-HxCDF	0.1	< 0.00000001	5E-10	< 0.00000001	5E-10	< 0.00000001	5E-10
1,2,3,7,8,9-HxCDD	0.1	< 0.00000001	5E-10	< 0.00000001	5E-10	5.1E-08	5.1E-09
1,2,3,7,8,9-HxCDF	0.1	< 0.00000001	5E-10	< 0.00000001	5E-10	< 0.00000001	5E-10
1,2,3,7,8-PeCDD	1	< 0.00000001	0.000000005	< 0.00000001	0.000000005	4.6E-08	0.000000046
1,2,3,7,8-PeCDF	0.05	< 0.00000001	2.5E-10	< 0.00000001	2.5E-10	< 0.00000001	2.5E-10
2,3,4,6,7,8-HxCDF	0.1	< 0.00000001	5E-10	< 0.00000001	5E-10	< 0.00000001	5E-10
2,3,4,7,8-PeCDF	0.5	< 0.00000001	2.5E-09	< 0.00000001	2.5E-09	< 0.00000001	2.5E-09
2,3,7,8-TCDD	1	< 2.1E-09	1.05E-09	< 2E-09	0.000000001	3.1E-09	3.1E-09
2,3,7,8-TCDF	0.1	< 2.1E-09	1.05E-10	< 2E-09	1E-10	8.9E-09	8.9E-10
OCDD	0.0001	0.00000018	1.8E-11	0.00000032	3.2E-11	0.00000035	3.5E-11
OCDF	0.0001	< 2.1E-08	1.05E-12	< 0.00000002	1E-12	< 0.00000002	1E-12
TEQ-Mammal (1)			**1.28E-08**		**1.29E-08**		**6.22E-08**

(1) - TEQ-Mammal is calculated by multipling each congener
by its coressponding TEF then summing all of the results.
Bolded and Shaded values indicat the TEQ-Mammal is greater than the surface water screening value standard.
< - Compound was not detected and half the detection limit was used to calculate the TEQ.

Table 5
Calculation of Dioxin Toxic Equivalents (TEQ) for Sediment Samples
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333 Adelaide Avenue
Providence, Rhode Island

chemical_name	TEF Humans-Mammals	SD-1001 SD-1001 12/28/2005 0-2	Sample*TEF	SD-1002 SD-1002 12/28/2005 0-2	Sample*TEF	SD-1003 SD-1003 12/28/2005 0-2	Sample*TEF	SD-1004 SD-1004 12/28/2005 0-2	Sample*TEF	SD-1005 SD-1005 12/28/2005 0-2	Sample*TEF
1,2,3,4,6,7,8-HpCDD	0.01	0.00011	0.0000011	0.000059	0.00000059	0.00013	0.0000013	0.00014	0.0000014	0.000017	0.00000017
1,2,3,4,6,7,8-HpCDF	0.01	0.000092	0.00000092	0.00016	0.0000016	0.00027	0.0000027	0.00021	0.0000021	0.00003	0.0000003
1,2,3,4,7,8,9-HpCDF	0.01	0.0000099	0.000000099	0.000014	0.00000014	0.000049	0.00000049	0.000047	0.00000047	0.0000041	0.000000041
1,2,3,4,7,8-HxCDD	0.1	0.0000049	0.00000049	0.0000061	0.00000061	0.000016	0.0000016	< 0.000014	0.0000007	< 0.0000018	0.00000009
1,2,3,4,7,8-HxCDF	0.1	0.00003	0.000003	0.000057	0.0000057	0.00017	0.000017	0.00011	0.000011	0.000017	0.0000017
1,2,3,6,7,8-HxCDD	0.1	0.000013	0.0000013	0.000012	0.0000012	0.000042	0.0000042	0.000039	0.0000039	0.0000047	0.00000047
1,2,3,6,7,8-HxCDF	0.1	0.000037	0.0000037	0.000059	0.0000059	0.00023	0.000023	0.00026	0.000026	0.000033	0.0000033
1,2,3,7,8,9-HxCDD	0.1	0.0000082	0.00000082	0.000008	0.0000008	0.000021	0.0000021	0.00002	0.000002	< 0.0000027	0.000000135
1,2,3,7,8,9-HxCDF	0.1	< 0.0000031	0.000000155	< 0.0000028	0.00000014	0.0000086	0.00000086	< 0.0000071	0.000000355	< 0.00000091	4.55E-08
1,2,3,7,8-PeCDD	1	0.0000097	0.0000097	0.0000074	0.0000074	0.000031	0.000031	0.000033	0.000033	< 0.000003	0.0000015
1,2,3,7,8-PeCDF	0.05	0.000016	0.0000008	0.000028	0.0000014	0.00006	0.000003	0.000055	0.00000275	0.0000083	0.000000415
2,3,4,6,7,8-HxCDF	0.1	0.000036	0.0000036	0.000051	0.0000051	0.00018	0.000018	0.00022	0.000022	0.000028	0.0000028
2,3,4,7,8-PeCDF	0.5	0.000036	0.000018	0.000043	0.0000215	0.00016	0.00008	0.00017	0.000085	0.000023	0.0000115
2,3,7,8-TCDD	1	0.0000053	0.0000053	0.0000025	0.0000025	0.0000095	0.0000095	0.0000092	0.0000092	0.00000098	0.00000098
2,3,7,8-TCDF	0.1	0.000018	0.0000018	0.000015	0.0000015	0.000027	0.0000027	0.000029	0.0000029	0.0000043	0.00000043
OCDD	0.0001	0.00075	0.000000075	0.00024	0.000000024	0.00042	0.000000042	0.00048	0.000000048	0.000077	7.7E-09
OCDF	0.0001	0.000075	7.5E-09	0.00019	0.000000019	0.00019	0.000000019	0.00007	0.000000007	0.0000076	7.6E-10
TEQ-Mammal (1)			**5.09E-05**		**5.61E-05**		**1.98E-04**		**2.03E-04**		**2.39E-05**

(1) - TEQ-Mammal is calculated by multipling each congener
by its coressponding TEF then summing all of the results.
Bolded and Shaded values indicat the TEQ-Mammal is greater than the sediment screening value standard.
< - Compound was not detected and half the detection limit was used to calculate the TEQ.

Table 5
Calculation of Dioxin Toxic Equivalents (TEQ) for Sediment Samples
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chemical_name	SED10 SED1001 6/22/2006 0_5-1	Sample*TEF	SED11 SED1101 6/22/2006 0-1	Sample*TEF	SED12 SED1201 6/22/2006 0_5-1	Sample*TEF	SED13 SED1301 6/22/2006 0-0_5	Sample*TEF	SED14 SED1401 6/22/2006 0-1	Sample*TEF	SED15 SED1501 6/22/2006 0-1	Sample*TEF
1,2,3,4,6,7,8-HpCDD	< 0.00000075	3.75E-09	0.00028	0.0000028	0.000068	0.00000068	0.0000022	0.000000022	0.000071	0.00000071	< 0.0000008	0.000000004
1,2,3,4,6,7,8-HpCDF	< 0.00000075	3.75E-09	0.00014	0.0000014	0.000079	0.00000079	< 0.00000076	3.8E-09	0.000037	0.00000037	< 0.0000008	0.000000004
1,2,3,4,7,8,9-HpCDF	< 0.00000075	3.75E-09	0.000018	0.00000018	0.000079	0.00000079	< 0.00000076	3.8E-09	0.0000044	0.000000044	< 0.0000008	0.000000004
1,2,3,4,7,8-HxCDD	< 0.00000075	3.75E-08	0.0000095	0.00000095	< 0.00000071	3.55E-08	< 0.00000076	0.000000038	0.0000033	0.00000033	< 0.0000008	0.00000004
1,2,3,4,7,8-HxCDF	< 0.00000075	3.75E-08	0.000036	0.0000036	< 0.00000071	3.55E-08	< 0.00000076	0.000000038	< 0.0000017	0.000000085	< 0.0000008	0.00000004
1,2,3,6,7,8-HxCDD	< 0.00000075	3.75E-08	0.000025	0.0000025	< 0.00000071	3.55E-08	< 0.00000076	0.000000038	0.0000068	0.00000068	< 0.0000008	0.00000004
1,2,3,6,7,8-HxCDF	< 0.00000075	3.75E-08	0.000086	0.0000086	< 0.00000071	3.55E-08	< 0.00000076	0.000000038	0.000026	0.0000026	< 0.0000008	0.00000004
1,2,3,7,8,9-HxCDD	< 0.00000075	3.75E-08	0.000017	0.0000017	0.00008	0.000008	< 0.00000076	0.000000038	0.0000034	0.00000034	< 0.0000008	0.00000004
1,2,3,7,8,9-HxCDF	< 0.00000075	3.75E-08	0.00003	0.000003	< 0.00000071	3.55E-08	< 0.00000076	0.000000038	0.0000084	0.00000084	< 0.0000008	0.00000004
1,2,3,7,8-PeCDD	< 0.00000075	0.000000375	0.000011	0.000011	< 0.00000071	0.000000355	< 0.00000076	0.00000038	0.0000048	0.0000048	< 0.0000008	0.0000004
1,2,3,7,8-PeCDF	< 0.00000075	1.875E-08	0.000032	0.0000016	< 0.00000071	1.775E-08	< 0.00000076	0.000000019	0.0000084	0.00000042	< 0.0000008	0.00000002
2,3,4,6,7,8-HxCDF	< 0.00000075	3.75E-08	0.00008	0.000008	< 0.00000071	3.55E-08	< 0.00000076	0.000000038	0.000051	0.0000051	< 0.0000008	0.00000004
2,3,4,7,8-PeCDF	< 0.00000075	1.875E-07	0.00043	0.000215	0.00000073	0.000000365	0.00000086	0.00000043	0.00015	0.000075	< 0.0000008	0.0000002
2,3,7,8-TCDD	< 0.00000015	0.000000075	0.0000042	0.0000042	< 0.00000014	0.00000007	< 0.00000015	0.000000075	0.0000014	0.0000014	< 0.00000016	0.00000008
2,3,7,8-TCDF	< 0.00000015	7.5E-09	< 0.00000057	2.85E-08	0.00000024	0.000000024	0.00000019	0.000000019	0.0000076	0.00000076	< 0.00000016	0.000000008
OCDD	0.0000044	4.4E-10	0.0018	0.00000018	0.00015	0.000000015	0.000016	1.6E-09	0.00047	0.000000047	0.0000044	4.4E-10
OCDF	< 0.0000015	7.5E-11	0.000087	8.7E-09	0.00012	0.000000012	0.0000016	1.6E-10	0.000036	3.6E-09	< 0.0000016	8E-11
TEQ-Mammal (1)		9.38E-07		**2.65E-04**		**1.13E-05**		1.22E-06		**9.35E-05**		1.00E-06

(1) - TEQ-Mammal is calculated by multipling each congener
by its coressponding TEF then summing all of the results.
Bolded and Shaded values indicat the TEQ-Mammal is greater than the sediment screening value standard.
< - Compound was not detected and half the detection limit was used to calculate the TEQ.

Table 5
Calculation of Dioxin Toxic Equivalents (TEQ) for Sediment Samples
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chemical_name	SED16 SED1601 6/22/2006 0-1	Sample*TEF	SED17 SED1701 6/22/2006 0_5-1	Sample*TEF	SED18 SED1801 6/22/2006 0-1	Sample*TEF	SED19 SED1901 6/22/2006 0-1	Sample*TEF	SED20 SED2001 6/22/2006 0_5-1	Sample*TEF
1,2,3,4,6,7,8-HpCDD	0.00048	0.0000048	0.000021	0.00000021	0.00064	0.0000064	0.00027	0.0000027	0.00009	0.0000009
1,2,3,4,6,7,8-HpCDF	0.00057	0.0000057	0.000035	0.00000035	0.001	0.00001	0.00051	0.0000051	0.0002	0.000002
1,2,3,4,7,8,9-HpCDF	0.000092	0.00000092	0.0000065	0.000000065	0.00017	0.0000017	0.00011	0.0000011	0.000041	0.00000041
1,2,3,4,7,8-HxCDD	0.000041	0.0000041	0.0000022	0.00000022	0.000074	0.0000074	0.000051	0.0000051	0.000015	0.0000015
1,2,3,4,7,8-HxCDF	0.00033	0.000033	0.000017	0.0000017	0.00067	0.000067	0.00039	0.000039	0.00014	0.000014
1,2,3,6,7,8-HxCDD	0.00012	0.000012	0.0000057	0.00000057	0.00019	0.000019	0.00012	0.000012	0.000035	0.0000035
1,2,3,6,7,8-HxCDF	0.00057	0.000057	0.00003	0.000003	0.0013	0.00013	0.00062	0.000062	0.00014	0.000014
1,2,3,7,8,9-HxCDD	0.000056	0.0000056	0.0000033	0.00000033	0.000097	0.0000097	0.000059	0.0000059	0.000016	0.0000016
1,2,3,7,8,9-HxCDF	0.00019	0.000019	0.000013	0.0000013	0.00039	0.000039	0.00025	0.000025	0.000052	0.0000052
1,2,3,7,8-PeCDD	0.000056	0.000056	0.0000033	0.0000033	0.000098	0.000098	0.000069	0.000069	0.00003	0.00003
1,2,3,7,8-PeCDF	< 0.0000034	0.000000085	0.0000081	0.000000405	< 0.0000032	0.00000008	< 0.0000027	6.75E-08	< 0.0000012	0.00000003
2,3,4,6,7,8-HxCDF	0.0004	0.00004	0.000075	0.0000075	0.00091	0.000091	0.00054	0.000054	0.00012	0.000012
2,3,4,7,8-PeCDF	0.0028	0.0014	0.00019	0.000095	0.0062	0.0031	0.0035	0.00175	0.00014	0.00007
2,3,7,8-TCDD	0.000016	0.000016	0.0000011	0.0000011	0.00003	0.00003	0.000021	0.000021	0.0000073	0.0000073
2,3,7,8-TCDF	0.000082	0.0000082	< 0.00000014	0.000000007	0.00012	0.000012	0.000058	0.0000058	0.0000093	0.00000093
OCDD	0.0023	0.00000023	0.00007	0.000000007	0.0027	0.00000027	0.00093	0.000000093	0.00024	0.000000024
OCDF	0.00025	0.000000025	0.000008	8E-10	0.0003	0.00000003	0.0001	0.00000001	0.000082	8.2E-09
TEQ-Mammal (1)		**1.66E-03**		**1.15E-04**		**3.62E-03**		**2.06E-03**		**1.63E-04**

(1) - TEQ-Mammal is calculated by multipling each congener
by its coressponding TEF then summing all of the results.
Bolded and Shaded values indicat the TEQ-Mammal is greater than the sediment screening value standard.
< - Compound was not detected and half the detection limit was used to calculate the TEQ.

Table 5
Calculation of Dioxin Toxic Equivalents (TEQ) for Sediment Samples
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chemical_name	SED21 SED2101 6/22/2006 0-1	Sample*TEF	SED22 SED2201 6/22/2006 0-1	Sample*TEF	SED23 SED2301 6/22/2006 0-1	Sample*TEF	SED24 SED2401 6/22/2006 0-1	Sample*TEF	SED25 SED2501 6/22/2006 0-1	Sample*TEF	SED26 SED2601 6/22/2006 0-1	Sample*TEF
1,2,3,4,6,7,8-HpCDD	0.0000045	0.000000045	0.00011	0.0000011	< 0.00000068	3.4E-09	0.000029	0.00000029	0.00032	0.0000032	0.00002	0.0000002
1,2,3,4,6,7,8-HpCDF	0.0000065	0.000000065	0.00016	0.0000016	< 0.00000068	3.4E-09	0.000029	0.00000029	0.00044	0.0000044	0.0000059	0.000000059
1,2,3,4,7,8,9-HpCDF	0.0000012	0.000000012	0.000025	0.00000025	< 0.00000068	3.4E-09	0.0000045	0.000000045	0.000079	0.00000079	< 0.0000014	0.000000007
1,2,3,4,7,8-HxCDD	< 0.00000084	0.000000042	< 0.000018	0.0000009	< 0.00000068	0.000000034	0.0000013	0.00000013	0.00003	0.000003	< 0.0000014	0.00000007
1,2,3,4,7,8-HxCDF	0.0000034	0.00000034	0.000068	0.0000068	< 0.00000068	0.000000034	0.000012	0.0000012	0.00031	0.000031	0.0000024	0.00000024
1,2,3,6,7,8-HxCDD	0.0000013	0.00000013	0.000028	0.0000028	< 0.00000068	0.000000034	0.0000054	0.00000054	0.000083	0.0000083	0.0000036	0.00000036
1,2,3,6,7,8-HxCDF	0.0000073	0.00000073	0.00016	0.000016	< 0.00000068	0.000000034	0.000016	0.0000016	0.00038	0.000038	< 0.0000014	0.00000007
1,2,3,7,8,9-HxCDD	< 0.00000084	0.000000042	< 0.000018	0.0000009	< 0.00000068	0.000000034	0.0000028	0.00000028	0.000038	0.0000038	0.0000017	0.00000017
1,2,3,7,8,9-HxCDF	0.0000024	0.00000024	0.000062	0.0000062	< 0.00000068	0.000000034	0.000007	0.0000007	0.00018	0.000018	< 0.0000014	0.00000007
1,2,3,7,8-PeCDD	0.00000095	0.00000095	0.000018	0.000018	< 0.00000068	0.00000034	0.0000024	0.0000024	0.000063	0.000063	< 0.0000014	0.0000007
1,2,3,7,8-PeCDF	0.0000023	0.000000115	0.000041	0.00000205	< 0.00000068	0.000000017	0.0000055	0.000000275	< 0.0000049	1.225E-07	< 0.0000014	0.000000035
2,3,4,6,7,8-HxCDF	0.000016	0.0000016	0.00015	0.000015	< 0.00000068	0.000000034	0.000012	0.0000012	0.00031	0.000031	< 0.0000014	0.00000007
2,3,4,7,8-PeCDF	0.000044	0.000022	0.0013	0.00065	< 0.00000068	0.00000017	0.000095	0.0000475	0.0022	0.0011	0.0000017	0.00000085
2,3,7,8-TCDD	< 0.00000017	0.000000085	0.0000068	0.0000068	< 0.00000014	0.00000007	0.00000072	0.00000072	0.000018	0.000018	< 0.00000028	0.00000014
2,3,7,8-TCDF	< 0.00000017	8.5E-09	0.000027	0.0000027	< 0.00000014	0.000000007	< 0.00000026	0.000000013	0.000053	0.0000053	0.0000016	0.00000016
OCDD	0.000025	2.5E-09	0.0005	0.00000005	0.0000035	3.5E-10	0.00017	0.000000017	0.0019	0.00000019	0.000043	4.3E-09
OCDF	0.0000022	2.2E-10	0.000044	4.4E-09	< 0.0000014	7E-11	0.000017	1.7E-09	0.00017	0.000000017	0.0000062	6.2E-10
TEQ-Mammal (1)		**2.64E-05**		**7.31E-04**		8.53E-07		**5.72E-05**		**1.33E-03**		3.21E-06

(1) - TEQ-Mammal is calculated by multipling each congener
by its coressponding TEF then summing all of the results.
Bolded and Shaded values indicat the TEQ-Mammal is greater than the sediment screening value standard.
< - Compound was not detected and half the detection limit was used to calculate the TEQ.

Table 5
Calculation of Dioxin Toxic Equivalents (TEQ) for Sediment Samples
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chemical_name	SED27 SED2701 6/22/2006 0-1	Sample*TEF	SED28 SED2801 6/21/2006 0_5-1	Sample*TEF	SED29 SED2901 6/21/2006 0_5-1	Sample*TEF	SED30 SED3001 6/21/2006 0_5-1	Sample*TEF	SED31 SED3101 6/21/2006 0_5-1	Sample*TEF	SED32 SED3201 6/21/2006 0_5-1	Sample*TEF
1,2,3,4,6,7,8-HpCDD	0.00018	0.0000018	0.00049	0.0000049	0.00018	0.0000018	0.000066	0.00000066	0.00043	0.0000043	0.000074	0.00000074
1,2,3,4,6,7,8-HpCDF	0.00023	0.0000023	0.00064	0.0000064	0.00035	0.0000035	0.000036	0.00000036	0.00071	0.0000071	0.00004	0.0000004
1,2,3,4,7,8,9-HpCDF	0.000036	0.00000036	0.000099	0.00000099	0.000069	0.00000069	0.0000061	0.000000061	0.00017	0.0000017	0.0000051	0.000000051
1,2,3,4,7,8-HxCDD	< 0.000021	0.00000105	0.000039	0.0000039	0.000018	0.0000018	0.0000034	0.00000034	0.000055	0.0000055	0.0000018	0.00000018
1,2,3,4,7,8-HxCDF	0.00013	0.000013	0.0003	0.00003	0.00021	0.000021	0.000018	0.0000018	0.00032	0.000032	0.000011	0.0000011
1,2,3,6,7,8-HxCDD	0.000037	0.0000037	0.00011	0.000011	0.00007	0.000007	0.000012	0.0000012	0.00015	0.000015	0.0000048	0.00000048
1,2,3,6,7,8-HxCDF	0.00015	0.000015	0.00052	0.000052	0.00029	0.000029	0.000014	0.0000014	0.00075	0.000075	0.000012	0.0000012
1,2,3,7,8,9-HxCDD	0.000022	0.0000022	0.000068	0.0000068	0.000031	0.0000031	0.0000072	0.00000072	0.000078	0.0000078	0.0000028	0.00000028
1,2,3,7,8,9-HxCDF	0.000075	0.0000075	0.0002	0.00002	0.00014	0.000014	0.0000096	0.00000096	0.00042	0.000042	0.0000053	0.00000053
1,2,3,7,8-PeCDD	0.000029	0.000029	0.000076	0.000076	0.000041	0.000041	0.0000052	0.0000052	0.00012	0.00012	0.0000022	0.0000022
1,2,3,7,8-PeCDF	0.000035	0.00000175	< 0.000018	0.00000045	< 0.0000018	0.000000045	< 0.0000007	1.75E-08	0.00023	0.0000115	< 0.00000073	1.825E-08
2,3,4,6,7,8-HxCDF	0.00018	0.000018	0.00042	0.000042	0.00023	0.000023	0.000013	0.0000013	0.00064	0.000064	0.000012	0.0000012
2,3,4,7,8-PeCDF	0.00091	0.000455	0.0031	0.00155	0.00016	0.00008	0.000076	0.000038	0.0016	0.0008	0.000028	0.000014
2,3,7,8-TCDD	0.0000081	0.0000081	0.000022	0.000022	0.000012	0.000012	0.00000062	0.00000062	0.000033	0.000033	0.00000052	0.00000052
2,3,7,8-TCDF	< 0.0000042	0.00000021	0.000084	0.0000084	0.000032	0.0000032	0.0000047	0.00000047	0.000076	0.0000076	0.000006	0.0000006
OCDD	0.00083	0.000000083	0.0029	0.00000029	0.00084	0.000000084	0.00054	0.000000054	0.0016	0.00000016	0.00081	0.000000081
OCDF	0.00013	0.000000013	0.00021	0.000000021	0.00017	0.000000017	0.000037	3.7E-09	0.00019	0.000000019	0.00008	0.000000008
TEQ-Mammal (1)		**5.59E-04**		**1.84E-03**		**2.41E-04**		**5.32E-05**		**1.23E-03**		**2.36E-05**

(1) - TEQ-Mammal is calculated by multipling each congener
by its coressponding TEF then summing all of the results.
Bolded and Shaded values indicat the TEQ-Mammal is greater than the sediment screening value standard.
< - Compound was not detected and half the detection limit was used to calculate the TEQ.

Table 6
Selection of Chemicals of Potential Concern - Surface Water
Supplemental Site Investigation
Former Gorham Manufacturing Site
333 Adelaide Avenue
Providence, Rhode Islande

Parameter	Frequency of Detection	Range of Non Detects	Range of Detected Concentrations	Average of Samples (1)	Screening Value (mg/L) (2)	Max > Screening Value	Selected as COPC? (3)	Rational
Volatile Organics (mg/L)								
1,1,1-Trichloroethane	11 / 15	0.001 - 0.001	0.001 - 0.0018	0.0012	0.32 nc	No	No	BSL
1,1-Dichloroethane	5 / 15	0.001 - 0.001	0.001 - 0.0014	0.00073	0.081 nc	No	No	BSL
1,2,4-Trimethylbenzene	2 / 15	0.001 - 0.001	0.001 - 0.0011	0.00057	0.0012 nc	No	No	BSL
cis-1,2-Dichloroethene	15 / 15		0.0015 - 0.0108	0.0046	0.0061 nc	Yes	Yes	ASL
Ethylbenzene	3 / 15	0.001 - 0.001	0.001 - 0.001	0.00060	0.13 nc	No	No	BSL
Tetrachloroethene	1 / 15	0.001 - 0.001	0.0012 - 0.0012	0.00055	0.0001 ca	Yes	Yes	ASL
Toluene	12 / 15	0.001 - 0.001	0.0011 - 0.0043	0.0023	0.072 nc	No	No	BSL
Trichloroethene	11 / 15	0.001 - 0.001	0.001 - 0.0029	0.0013	0.000028 ca	Yes	Yes	ASL
Vinyl chloride	10 / 15	0.001 - 0.001	0.001 - 0.0021	0.0012	0.00002 ca	Yes	Yes	ASL
Xylene, M&P-	5 / 15	0.002 - 0.002	0.002 - 0.0028	0.0015	0.021 nc	No	No	BSL
Xylene, O-	3 / 15	0.001 - 0.001	0.001 - 0.0012	0.00062	0.021 nc	No	No	BSL
Xylenes, Total	15 / 15		0.003 - 0.004	0.0031	0.021 nc	No	No	BSL
Semivolatile Organics (mg/L)								
Benzo(a)anthracene	1 / 15	0.0002 - 0.0002	0.0002 - 0.0002	0.00011	0.000092 ca	Yes	Yes	ASL
Benzo(a)pyrene	1 / 15	0.0002 - 0.0002	0.00024 - 0.00024	0.00011	0.0000092 ca	Yes	Yes	ASL
Benzo(g,h,i)perylene	1 / 15	0.0002 - 0.0002	0.00038 - 0.00038	0.00012	0.018 nc	No	No	BSL
Chrysene	1 / 15	0.0002 - 0.0002	0.00023 - 0.00023	0.00011	0.0092 ca	No	No	BSL
Dibenz(a,h)anthracene	1 / 15	0.0002 - 0.0002	0.00031 - 0.00031	0.00011	0.0000092 ca	Yes	Yes	ASL
Naphthalene	4 / 15	0.0002 - 0.0002	0.0002 - 0.0003	0.00014	0.00062 nc	No	No	BSL
Pesticides/PCBs (mg/L)								
4,4'-DDT	1 / 3	0.000050 - 0.000050	0.000080 - 0.000080	0.000043	0.0002 ca*	No	No	BSL
Metals, Total (mg/L)								
Chromium	3 / 15	0.02 - 0.02	0.034 - 0.06	0.017	0.11 ca	No	No	BSL
Copper	5 / 15	0.02 - 0.02	0.023 - 0.126	0.030	0.15 nc	No	No	BSL
Lead	5 / 15	0.005 - 0.005	0.0083 - 0.0318	0.0089			Yes	NSL
Silver	3 / 15	0.005 - 0.005	0.005 - 0.008	0.0033	0.018 nc	No	No	BSL
Zinc	4 / 15	0.05 - 0.05	0.068 - 0.146	0.046	1.1 nc	No	No	BSL
Dioxins/Furans (mg/L)								
TEQ-Mammal	3 / 3		1.27641E-08 6.2206E-08	0.000000029	4.5E-10 ca	Yes	Yes	ASL

[1] Average calculated using half the detection limit for non detects.

[2] Screening Values are the Preliminary Remediation Goals (PRGs) for Tap Water from the USEPA Region IX PRG Table (October 2004).
nc - PRG is based on a non-cancer hazard quotient of 0.1.
ca - PRG is based on a cancer risk of 1 in 1 million.

[3] Chemical is selected as a COPC if the maximum detect is greater than the screening value or if a screening value is not available.

COPC - Chemical of Potential Concern
mg/L - milligrams per liter

Prepared by: BJR
Checked by: KJC

Table 7
Selection of Chemicals of Potential Concern - Sediment
Supplemental Site Investigation Report for the Park Parcel/Mashapaug Cove
Former Gorham Manufacturing Site
333 Adelaide Avenue
Providence, Rhode Island

Parameter	Frequency of Detection	Range of Non Detects	Range of Detected Concentrations	Average of Samples (1)	Residential Soil PRG (mg/kg) (2)		Max > Screening Value	Selected As a COPC? (3)	Rational
Volatile Organics (mg/kg)									
1,1,1-Trichloroethane	5 / 28	0.004 - 0.15	0.3 - 1.3	0.15	1200	sat	No	No	BSL
1,1-Dichloroethane	9 / 28	0.004 - 1.1	0.011 - 7.92	0.64	51	nc	No	No	BSL
1,1-Dichloroethene	5 / 28	0.004 - 1.1	0.014 - 11.3	0.52	12	nc	No	No	BSL
Acetone	14 / 28	0.039 - 4.6	0.0757 - 1.9	0.32	1400	nc	No	No	BSL
Carbon Disulfide	6 / 28	0.004 - 1.1	0.0046 - 0.0576	0.033	36	nc	No	No	BSL
cis-1,2-Dichloroethene	9 / 28	0.004 - 1.1	0.0091 - 175	10.8	4.3	nc	Yes	Yes	ASL
Isopropyl Benzene	1 / 28	0.004 - 1.1	0.0514 - 0.0514	0.030	57	nc	No	No	BSL
s-Butylbenzene	2 / 28	0.004 - 1.1	0.0197 - 0.0303	0.030			NSL	Yes	NSL
Tetrachloroethene	4 / 28	0.004 - 1.1	0.0081 - 18.1	0.71	0.48	ca*	Yes	Yes	ASL
Toluene	1 / 28	0.004 - 1.1	1.92 - 1.92	0.097	520	sat	No	No	BSL
trans-1,2-Dichloroethene	3 / 28	0.004 - 1.1	0.0053 - 3.62	0.26	6.9	nc	No	No	BSL
Trichloroethene	9 / 28	0.004 - 0.15	0.176 - 58.4	3.0	0.053	ca	Yes	Yes	ASL
Vinyl chloride	7 / 28	0.0081 - 2.3	0.0218 - 24.8	1.7	0.079	ca	Yes	Yes	ASL
Semivolatile Organics (mg/kg)									
Acenaphthene	6 / 28	0.03 - 0.183	0.024 - 0.26	0.062	370	nc	No	No	BSL
Acenaphthylene	3 / 28	0.0079 - 0.183	0.026 - 0.781	0.064	230	nc	No	No	BSL
Anthracene	13 / 28	0.0305 - 0.183	0.04 - 3.09	0.24	2200	nc	No	No	BSL
Benzo(a)anthracene	18 / 28	0.0305 - 0.183	0.0896 - 15.1	0.87	0.62	ca	Yes	Yes	ASL
Benzo(a)pyrene	17 / 28	0.0305 - 0.183	0.0707 - 7.87	0.57	0.062	ca	Yes	Yes	ASL
Benzo(b)fluoranthene	21 / 28	0.0305 - 0.183	0.0378 - 14.8	1.0	0.62	ca	Yes	Yes	ASL
Benzo(g,h,i)perylene	14 / 28	0.0305 - 0.183	0.046 - 2.54	0.21	230	nc	No	No	BSL
Benzo(k)fluoranthene	12 / 28	0.0305 - 0.183	0.065 - 5.1	0.35	6.2	ca	No	No	BSL
Chrysene	17 / 28	0.0305 - 0.183	0.0896 - 8.94	0.66	62	ca	No	No	BSL
Dibenzo(a,h)anthracene	6 / 28	0.0079 - 0.183	0.0404 - 1.45	0.099	0.062	ca	Yes	Yes	ASL
Di-n-butylphthalate	2 / 5	0.2 - 0.74	0.48 - 1.1	0.44	610	nc	No	No	BSL
Fluoranthene	23 / 28	0.0305 - 0.035	0.0833 - 28.8	1.8	230	nc	No	No	BSL
Fluorene	9 / 28	0.018 - 0.183	0.022 - 0.863	0.082	270	nc	No	No	BSL
Indeno(1,2,3-cd)pyrene	13 / 28	0.03 - 0.183	0.046 - 2.47	0.21	0.62	ca	Yes	Yes	ASL
Naphthalene	5 / 28	0.03 - 0.183	0.0342 - 0.28	0.054	5.6	nc	No	No	BSL
Phenanthrene	19 / 28	0.0305 - 0.183	0.0333 - 11.8	1.0	230	nc	No	No	BSL
Pyrene	22 / 28	0.0305 - 0.0794	0.0513 - 15.2	1.2	230	nc	No	No	BSL
Pesticides/PCBs (mg/kg)									
4,4'-DDD	3 / 28	0.0008 - 0.0481	0.0214 - 0.0301	0.010	2.4	ca	No	No	BSL
4,4'-DDE	1 / 28	0.0008 - 0.0481	0.0109 - 0.0109	0.0084	1.7	ca	No	No	BSL
4,4'-DDT	1 / 28	0.0008 - 0.0481	0.0635 - 0.0635	0.010	1.7	ca*	No	No	BSL
Endrin ketone	1 / 28	0.0008 - 0.0481	0.0431 - 0.0431	0.0092			NSL	No	FOD

Table 7
Selection of Chemicals of Potential Concern - Sediment
Supplemental Site Investigation Report for the Park Parcel/Mashapaug Cove
Former Gorham Manufacturing Site
333 Adelaide Avenue
Providence, Rhode Island

Parameter	Frequency of Detection	Range of Non Detects	Range of Detected Concentrations	Average of Samples (1)	Residential Soil PRG (mg/kg) (2)		Max > Screening Value	Selected As a COPC? (3)	Rational
Aroclor-1254	2 / 28	0.016 - 0.404	0.207 - 0.528	0.092	0.11	nc	Yes	Yes	ASL
Aroclor-1260	1 / 28	0.016 - 0.404	0.605 - 0.605	0.086	0.11	nc	Yes	No	FOD
Inorganics (mg/kg)									
Antimony	2 / 28	0.54 - 25.7	1.6 - 2.7	6.0	3.1	nc	No	No	BSL
Arsenic	22 / 28	0.3 - 3	2.1 - 47.6	16.8	0.39	ca*	Yes	Yes	ASL
Barium	28 / 28		9.7 - 466	123	540	nc	No	No	BSL
Beryllium	22 / 28	0.07 - 0.13	0.075 - 3.5	0.55	15	nc	No	No	BSL
Cadmium	20 / 28	0.65 - 1.31	0.14 - 7.11	2.6	3.7	nc	Yes	Yes	ASL
Chromium	28 / 28		2.9 - 640	192	210	ca	Yes	Yes	ASL
Copper	28 / 28		4.1 - 2670	955	310	nc	Yes	Yes	ASL
Lead	24 / 28	6.5 - 7.4	12.2 - 1120	364	400	nc	Yes	Yes	ASL
Mercury	17 / 28	0.035 - 0.208	0.031 - 2.52	0.40	2.3	nc	Yes	Yes	ASL
Nickel	25 / 28	3.7 - 6.6	3.6 - 853	132	160	nc	Yes	Yes	ASL
Selenium	3 / 28	0.54 - 25.7	1.8 - 17.9	6.5	39	nc	No	No	BSL
Silver	22 / 28	0.65 - 1.31	2.77 - 227	67.4	39	nc	Yes	Yes	ASL
Zinc	28 / 28		9.5 - 1940	783	2300	nc	No	No	BSL
TPH (mg/kg)									
Total Petroleum Hydrocarbons (TPH)	19 / 28	42.6 - 291	57.8 - 2600	543			NSL	Yes	NSL
Dioxins/Furans (mg/kg)									
TEQ-Mammal	28 / 28		9E-07 - 0.0036	0.00052	0.0000039	ca	Yes	Yes	ASL

(1) Average concentration is the arithmetic mean calculated using 1/2 the detection limit for non-detects.

(2) Values are the Preliminary Remediation Goals (PRGs) from the USEPA Region IX PRG Table (October 2004).
- nc - PRG is based on a non-cancer hazard quotient of 0.1.
- ca - PRG is based on a cancer risk of 1 in 1 million.
- ca* - where nc PRG<100 x ca PRG.
- ca** - where nc PRG<10 x ca PRG.
- sat - PRG is based on the soil saturation line.

(3) Parameter is selected as a COPC if the maximum detected concentration is greater than the identified screening value (or if a screening level is not available) unless the frequency of detection for that parameter is less than 5%.
- ASL - Maximum detected concentration is above screening level.
- BSL - Maximum detected concentration is below screening level
- FOD - Frequency of detection less than 5%.
- NSL - No screening level available.

mg/Kg - milligrams per kilogram

Prepared by: BJR
Checked by: KJC

Table 8
RME Values Used For Daily Intake Calculations - Surface Water
Supplemental Site Investigation Report
Former Gorham Manufacturing Site
333 Adelaide Avenue
Providence, Rhode Island

SCENARIO TIMEFRAME: CURRENT/FUTURE
MEDIUM: SURFACE WATER
EXPOSURE MEDIUM: SURFACE WATER

EXPOSURE ROUTE	RECEPTOR POPULATION	RECEPTOR AGE	EXPOSURE POINT	PARAMETER CODE	PARAMETER DEFINITION	VALUE	UNITS	RATIONALE/ REFERENCE	INTAKE EQUATION/ MODEL NAME
INGESTION	TRESPASSER	ADULT (ages 19 and above) (Swimming and Wading)	INNER COVE OUTER COVE	CW	CHEMICAL CONCENTRATION IN WATER	chemical-specific	mg/l	EPC Table	INTAKE-INGESTION = CW x IR-W x FI x ET x EF x ED x 1/BW x 1/AT
				IR-W	INGESTION RATE OF WATER	0.05	l/hour	USEPA, 1988[1]	
				FI	FRACTION INGESTED	1	unitless	Professional Judgement[2]	
				EF	EXPOSURE FREQUENCY	51	event/yr	Professional Judgement[3]	
				ED	EXPOSURE DURATION	12	yr	USEPA, 1994[4,6]	
				ET	EXPOSURE TIME	1	hours/event	USEPA, 1997[5]	
				BW	BODY WEIGHT	70	kg	USEPA, 1994	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	4380	day	USEPA, 1989	
		ADOLESCENT (ages 7 - 18) (Swimming and Wading)	INNER COVE OUTER COVE	CW	CHEMICAL CONCENTRATION IN WATER	chemical-specific	mg/l	EPC Table	INTAKE-INGESTION = CW x IR-W x FI x ET x EF x ED x 1/BW x 1/AT
				IR-W	INGESTION RATE OF WATER	0.05	l/hour	USEPA, 1988[1]	
				FI	FRACTION INGESTED	1	unitless	Professional Judgement[2]	
				EF	EXPOSURE FREQUENCY	51	event/yr	Professional Judgement[3]	
				ED	EXPOSURE DURATION	12	yr	USEPA, 1994[6]	
				ET	EXPOSURE TIME	1	hours/event	USEPA, 1997[5]	
				BW	BODY WEIGHT	45	kg	USEPA, 1997[7]	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	4380	day	USEPA, 1989	
	COMMERCIAL/INDUSTRIAL WORKER	ADULT (ages 19 and above) (Wading only)	INNER COVE OUTER COVE	CW	CHEMICAL CONCENTRATION IN WATER	chemical-specific	mg/l	EPC Table	INTAKE-INGESTION = CW x IR-W x FI x ET x EF x ED x 1/BW x 1/AT
				IR-W	INGESTION RATE OF WATER	0.005	l/hour	USEPA, 1988	
				FI	FRACTION INGESTED	1	unitless	Professional Judgement[2]	
				EF	EXPOSURE FREQUENCY	17	event/yr	Professional Judgement[9]	
				ED	EXPOSURE DURATION	25	yr	USEPA, 1994[6]	
				ET	EXPOSURE TIME	1	hours/event	Professional Judgement	
				BW	BODY WEIGHT	70	kg	USEPA, 1994	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	9125	day	USEPA, 1989	

Table 8
RME Values Used For Daily Intake Calculations - Surface Water
Supplemental Site Investigation Report
Former Gorham Manufacturing Site
333 Adelaide Avenue
Providence, Rhode Island

SCENARIO TIMEFRAME: CURRENT/FUTURE
MEDIUM: SURFACE WATER
EXPOSURE MEDIUM: SURFACE WATER

EXPOSURE ROUTE	RECEPTOR POPULATION	RECEPTOR AGE	EXPOSURE POINT	PARAMETER CODE	PARAMETER DEFINITION	VALUE	UNITS	RATIONALE/ REFERENCE	INTAKE EQUATION/ MODEL NAME
DERMAL	TRESPASSER	ADULT (ages 19 and above) (Swimming and Wading)	INNER COVE OUTER COVE	CW	CHEMICAL CONCENTRATION IN WATER	chemical-specific	mg/l	EPC Table	INTAKE-DERMAL = CW x SA x PCevent x EF x ED x CF x 1/BW x 1/AT
				PCevent	PERMEABILITY CONSTANT PER EVENT	chemical-specific	cm	USEPA, 2001	PCevent = PC x ET; calculated in PCevent table
				SA	SKIN SURFACE AREA AVAILABLE FOR C	9707	cm2	USEPA, 2001[8]	
				ET	EXPOSURE TIME	1	hr/event	USEPA, 1997[5]	
				EF	EXPOSURE FREQUENCY	51	event/yr	Professional Judgement[3]	
				ED	EXPOSURE DURATION	12	yr	USEPA, 1994[4,6]	
				BW	BODY WEIGHT	70	kg	USEPA, 1994	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	4380	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.001	l/cm3		
		ADOLESCENT (ages 7 - 18) (Swimming and Wading)	INNER COVE OUTER COVE	CW	CHEMICAL CONCENTRATION IN WATER	chemical-specific	mg/l	EPC Table	INTAKE-DERMAL = CW x SA x PCevent x EF x ED x CF x 1/BW x 1/AT
				PCevent	PERMEABILITY CONSTANT PER EVENT	chemical-specific	cm	USEPA, 2001	PCevent = PC x ET; calculated in PCevent table
				SA	SKIN SURFACE AREA AVAILABLE FOR C	7115	cm2	USEPA, 2001[8]	
				ET	EXPOSURE TIME	1	hr/event	USEPA, 1997[5]	
				EF	EXPOSURE FREQUENCY	51	event/yr	Professional Judgement[3]	
				ED	EXPOSURE DURATION	12	yr	USEPA, 1994[6]	
				BW	BODY WEIGHT	45	kg	USEPA, 1997[7]	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	4380	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.001	l/cm3		
	COMMERCIAL/INDUSTRIAL WORKER	ADULT (ages 19 and above) (Wading only)	INNER COVE OUTER COVE	CW	CHEMICAL CONCENTRATION IN WATER	chemical-specific	mg/l	EPC Table	INTAKE-DERMAL = CW x SA x PCevent x EF x ED x CF x 1/BW x 1/AT
				PCevent	PERMEABILITY CONSTANT PER EVENT	chemical-specific	cm	USEPA, 2001	PCevent = PC x ET; calculated in PCevent table
				SA	SKIN SURFACE AREA AVAILABLE FOR C	4860	cm2	USEPA, 1997[10]	
				ET	EXPOSURE TIME	1	hr/event	Professional Judgement	
				EF	EXPOSURE FREQUENCY	17	event/yr	Professional Judgement[9]	
				ED	EXPOSURE DURATION	25	yr	USEPA, 1994[6]	
				BW	BODY WEIGHT	70	kg	USEPA, 1994	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	9125	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.001	l/cm3		

USEPA, 1988. Superfund Exposure Assessment Manual. Office of Remedial Response; EPA/540/1-88/001; Washington, D.C.

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USEPA, 1994. "Risk Updates No. 2"; USEPA Region I, Waste Management Division; August. Values from "Attachment 2" to Risk Updates No. 2.

USEPA, 1997. "Exposure Factors Handbook, Volume 1"; Office of Research and Development; EPA-600/P-95/002Fa; Washington, D.C.; August.

USEPA, 2001. "Risk Assessment Guidance for Superfund. Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim. EPA/540/R/99/005.

1 - Value for swimming used

2 - 100% of daily incidental intake of surface water is attributable to incidental ingestion at the Site.

3 - Receptor assumed to visit area to wade or swim 3 days per week, mid May through mid September. Wading is assumed to occur all 3 days and swimming occurs on one of those days. Sediment contact would occur during wading and swimming activites.

4 - Representing ages 19 and above of a 30-year residential exposure duration.

5 - Recommended value for swimming exposures.

6 - The total RME exposure duration is 30 years, consistent with USEPA, 1994. The allocation of exposure duration for the three age groups is based on professional judgement.

7 - Values are the average of 50th percentile body weights for males and females ages 7 through 18.

8 - Value represents a weighted average for swimming and wading scenarios. Whole-body surface area values used for exposures during swimming (17 days); value for the adolescent is the average of 50th percentile whole-body surface areas of males ages 7 through 18 (14,197 cm^2). Surface area values used for exposure during wading (34 days) are the 50th percentile surface areas of males ages 7 though 18 for the hands, lower legs and feet (3,574 cm^2). Whole-body surface area values used for exposures during swimming (17 days); value for the adult is 19,400 cm^2. Surface area values used for exposure during wading (34 days) for the adult assume hands, lower legs and feet (4,860 cm^2).

9 - Receptor assumed to wade 1 day per week, mid May to mid September.

10 - Surface area values used for the adult assume hands, lower legs, and feet.

mg - milligrams

cm^2 - square centimeters

cm^3 - cubic centimeters

l - liter

kg - kilograms

Table 9
RME Values Used For Daily Intake Calculations - Sediment
Supplemental Site Investigation Report
Former Gorham Manufacturing Site
333 Adelaide Avenue
Providence, Rhode Island

SCENARIO TIMEFRAME: CURRENT/FUTURE
MEDIUM: SEDIMENT
EXPOSURE MEDIUM: SEDIMENT

EXPOSURE ROUTE	RECEPTOR POPULATION	RECEPTOR AGE	EXPOSURE POINT	PARAMETER CODE	PARAMETER DEFINITION	VALUE	UNITS	RATIONALE/ REFERENCE	INTAKE EQUATION/ MODEL NAME
INGESTION	TRESPASSER	ADULT	INNER COVE	CS	CHEMICAL CONCENTRATION IN SEDIME	chemical-specific	mg/kg	EPC Table	INTAKE-INGESTION =
		(ages 19 and above	OUTER COVE	IR-S	INGESTION RATE OF SEDIMENT	100	mg/day	USEPA, 1994[1]	CS x IR-S x FI x EF x ED x CF x 1/BW x 1/AT
				FI	FRACTION INGESTED	1	unitless	Professional Judgement	
				EF	EXPOSURE FREQUENCY	51	day/yr	Professional Judgement[3]	
				ED	EXPOSURE DURATION	12	yr	USEPA, 1994[4,5]	
				BW	BODY WEIGHT	70	kg	USEPA, 1994	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	4380	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.000001	kg/mg		
		ADOLESCENT	INNER COVE	CS	CHEMICAL CONCENTRATION IN SEDIME	chemical-specific	mg/kg	EPC Table	INTAKE-INGESTION =
		(ages 7 - 18)	OUTER COVE	IR-S	INGESTION RATE OF SEDIMENT	100	mg/day	USEPA, 1994[1]	CS x IR-S x FI x EF x ED x CF x 1/BW x 1/AT
				FI	FRACTION INGESTED	1	unitless	Professional Judgement	
				EF	EXPOSURE FREQUENCY	51	day/yr	Professional Judgement[3]	
				ED	EXPOSURE DURATION	12	yr	USEPA, 1994[5]	
				BW	BODY WEIGHT	45	kg	USEPA, 1997[6]	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	4380	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.000001	kg/mg		
	COMMERCIAL/INDUSTRIAL	ADULT	INNER COVE	CS	CHEMICAL CONCENTRATION IN SEDIME	chemical-specific	mg/kg	EPC Table	INTAKE-INGESTION =
	WORKER	(ages 19 and above	OUTER COVE	IR-S	INGESTION RATE OF SEDIMENT	50	mg/day	RIDEM, 2004[1]	CS x IR-S x FI x EF x ED x CF x 1/BW x 1/AT
				FI	FRACTION INGESTED	0.5	unitless	Professional Judgement[2]	
				EF	EXPOSURE FREQUENCY	17	day/yr	Professional Judgement[10]	
				ED	EXPOSURE DURATION	25	yr	USEPA, 1994	
				BW	BODY WEIGHT	70	kg	USEPA, 1994	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	9125	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.000001	kg/mg		
DERMAL	TRESPASSER	ADULT	INNER COVE	CS	CHEMICAL CONCENTRATION IN SEDIME	chemical-specific	mg/kg	EPC Table	INTAKE-DERMAL =
		(ages 19 and above	OUTER COVE	AF	ADHERENCE FACTOR	0.07	mg/cm2	USEPA, 2001[8]	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
		(Wading)		AbF	ABSORPTION FACTOR	chemical-specific	unitless	USEPA, 2001[9]	
				SA	SKIN SURFACE AREA AVAILABLE FOR C	4860	cm2/day	USEPA, 1997[7]	Where DAevent =
				EV	EVENT DAY	1	unitless	Professional Judgement	CS x AF x AbF x CF
				EF	EXPOSURE FREQUENCY	51	day/yr	Professional Judgement[3]	
				ED	EXPOSURE DURATION	12	yr	USEPA, 1994[4,5]	
				BW	BODY WEIGHT	70	kg	USEPA, 1994	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	4380	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.000001	kg/mg		
		ADOLESCENT	INNER COVE	CS	CHEMICAL CONCENTRATION IN SEDIME	chemical-specific	mg/kg	EPC Table	INTAKE-DERMAL =
		(ages 7 - 18)	OUTER COVE	AF	ADHERENCE FACTOR	0.2	mg/cm2	USEPA, 2001[8]	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
		(Wading)		AbF	ABSORPTION FACTOR	chemical-specific	unitless	USEPA, 2001[9]	
				SA	SKIN SURFACE AREA AVAILABLE FOR C	3574	cm2/day	USEPA, 1997[7]	Where DAevent =
				EV	EVENT DAY	1	unitless	Professional Judgement	CS x AF x AbF x CF
				EF	EXPOSURE FREQUENCY	51	day/yr	Professional Judgement[3]	
				ED	EXPOSURE DURATION	12	yr	USEPA, 1994[5]	
				BW	BODY WEIGHT	45	kg	USEPA, 1997[6]	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	4380	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.000001	kg/mg		

Table 9
RME Values Used For Daily Intake Calculations - Sediment
Supplemental Site Investigation Report
Former Gorham Manufacturing Site
333 Adelaide Avenue
Providence, Rhode Island

SCENARIO TIMEFRAME: CURRENT/FUTURE
MEDIUM: SEDIMENT
EXPOSURE MEDIUM: SEDIMENT

EXPOSURE ROUTE	RECEPTOR POPULATION	RECEPTOR AGE	EXPOSURE POINT	PARAMETER CODE	PARAMETER DEFINITION	VALUE	UNITS	RATIONALE/ REFERENCE	INTAKE EQUATION/ MODEL NAME
DERMAL (cont)	COMMERCIAL/INDUSTRIAL WORKER	ADULT (ages 19 and above (Wading)	INNER COVE OUTER COVE	CS	CHEMICAL CONCENTRATION IN SEDIME	chemical-specific	mg/kg	EPC Table	INTAKE-DERMAL = DAevent x SA x EV x EF x ED x 1/BW x 1/AT
				AF	ADHERENCE FACTOR	0.07	mg/cm2	USEPA, 2001[8]	
				AbF	ABSORPTION FACTOR	chemical-specific	unitless	USEPA, 2001[9]	
				SA	SKIN SURFACE AREA AVAILABLE FOR C	4860	cm2/day	USEPA, 1997[7]	Where DAevent = CS x AF x AbF x CF
				EV	EVENT DAY	1	unitless	Professional Judgement	
				EF	EXPOSURE FREQUENCY	17	day/yr	Professional Judgement[10]	
				ED	EXPOSURE DURATION	25	yr	USEPA, 1994	
				BW	BODY WEIGHT	70	kg	USEPA, 1994	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	9125	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.000001	kg/mg		

RIDEM, 2004. "Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases". State of Rhode Island and Providence Plantations Department of Environmental Management, Office of Waste Management. February.

USEPA, 1989. "Risk Assessment Guidance for Superfund, Volume 1, Human Health Evaluation Manual (Part A)"; Office of Emergency and Remedial Response; EPA-540/1-89/002 (interim final); Washington, D.C., December.

USEPA, 1994. "Risk Updates No. 2"; USEPA Region I, Waste Management Division; August. Values from "Attachment 2" to Risk Updates No. 2.

USEPA, 1997. "Exposure Factors Handbook, Volume 1"; Office of Research and Development; EPA-600/P-95/002Fa; Washington, D.C.; August.

USEPA, 2001. "Risk Assessment Guidance for Superfund. Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim. EPA/540/R/99/005.

1 - Soil ingestion rate used because ingestion rates for sediment are not available.

2 - 50% of daily incidental intake of soil and sediment is attributable to incidental sediment ingestion.

3 - Receptor assumed to visit area to wade or swim 3 days per week, mid May through mid September. Wading is assumed to occur all 3 days and swimming occurs on one of those days. Sediment contact would occur during wading and swimming activites.

4 - Representing ages 19 and above of a 30-year residential exposure duration.

5 - The total RME exposure duration is 30 years, consistent with USEPA, 1994. The allocation of exposure duration for the three age groups is based on professional judgement.

6 - Values are the average of 50th percentile body weights for males and females ages 7 through 18.

7 - Values are the average of 50th percentile body surface areas (sum of areas for hands, lower legs, and feet) for males in the various age groups indicated.

8 - Values for residential exposure to soil used as conservative estimate of potential sediment adherence; sediment is submerged, so adherence is unlikely.

9 - Values are provided (Table 3-4 of USEPA, 2001) for arsenic, cadmium, chlordane, 2,4-D, DDT (used for DDD, DDE), TCDD, lindane (used for other BHC isomers), PAHs, PCBs, and pentachlorophenol. A single value is listed for all other SVOCs. No values are listed for VOCs, other pesticides, or other inorganics and, subsequently, no value will be assigned to the ABSd term for COPCs falling into those categories.

10 - Receptor assumed to wade 1 day per week, mid May to mid September.

mg - milligrams
cm^2 - square centimeters
kg - kilograms

Table 10
CT Values Used For Daily Intake Calculations - Surface Water
Supplemental Site Investigation Report
Former Gorham Manufacturing Site
333 Adelaide Avenue
Providence, Rhode Island

SCENARIO TIMEFRAME: CURRENT/FUTURE
MEDIUM: SURFACE WATER
EXPOSURE MEDIUM: SURFACE WATER

EXPOSURE ROUTE	RECEPTOR POPULATION	RECEPTOR AGE	EXPOSURE POINT	PARAMETER CODE	PARAMETER DEFINITION	VALUE	UNITS	RATIONALE/ REFERENCE	INTAKE EQUATION/ MODEL NAME
INGESTION	TRESPASSER	ADULT (ages 19 and above) (Swimming and Wading)	INNER COVE OUTER COVE	CW	CHEMICAL CONCENTRATION IN WATER	chemical-specific	mg/l	EPC Table	INTAKE-INGESTION = CW x IR-W x FI x ET x EF x ED x 1/BW x 1/AT
				IR-W	INGESTION RATE OF WATER	0.05	l/hour	USEPA, 1988[1]	
				FI	FRACTION INGESTED	1	unitless	Professional Judgement[2]	
				EF	EXPOSURE FREQUENCY	34	event/yr	Professional Judgement[3]	
				ED	EXPOSURE DURATION	4	yr	USEPA, 1994[4,6]	
				ET	EXPOSURE TIME	1.5	hours/event	USEPA, 1997[5]	
				BW	BODY WEIGHT	70	kg	USEPA, 1994	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	1460	day	USEPA, 1989	
		ADOLESCENT (ages 7 - 18) (Swimming and Wading)	INNER COVE OUTER COVE	CW	CHEMICAL CONCENTRATION IN WATER	chemical-specific	mg/l	EPC Table	INTAKE-INGESTION = CW x IR-W x FI x ET x EF x ED x 1/BW x 1/AT
				IR-W	INGESTION RATE OF WATER	0.05	l/hour	USEPA, 1988[1]	
				FI	FRACTION INGESTED	1	unitless	Professional Judgement[2]	
				EF	EXPOSURE FREQUENCY	34	event/yr	Professional Judgement[3]	
				ED	EXPOSURE DURATION	3	yr	USEPA, 1994[6]	
				ET	EXPOSURE TIME	1.5	hours/event	USEPA, 1997[5]	
				BW	BODY WEIGHT	45	kg	USEPA, 1997[7]	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	1095	day	USEPA, 1989	
	COMMERCIAL/INDUSTRIAL WORKER	ADULT (ages 19 and above) (Wading only)	INNER COVE OUTER COVE	CW	CHEMICAL CONCENTRATION IN WATER	chemical-specific	mg/l	EPC Table	INTAKE-INGESTION = CW x IR-W x FI x ET x EF x ED x 1/BW x 1/AT
				IR-W	INGESTION RATE OF WATER	0.005	l/hour	USEPA, 1988	
				FI	FRACTION INGESTED	1	unitless	Professional Judgement[2]	
				EF	EXPOSURE FREQUENCY	8.5	event/yr	Professional Judgement[9]	
				ED	EXPOSURE DURATION	12.5	yr	USEPA, 1994[6]	
				ET	EXPOSURE TIME	1	hours/event	Professional Judgement	
				BW	BODY WEIGHT	70	kg	USEPA, 1994	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	4562.5	day	USEPA, 1989	

Table 10
CT Values Used For Daily Intake Calculations - Surface Water
Supplemental Site Investigation Report
Former Gorham Manufacturing Site
333 Adelaide Avenue
Providence, Rhode Island

SCENARIO TIMEFRAME: CURRENT/FUTURE
MEDIUM: SURFACE WATER
EXPOSURE MEDIUM: SURFACE WATER

EXPOSURE ROUTE	RECEPTOR POPULATION	RECEPTOR AGE	EXPOSURE POINT	PARAMETER CODE	PARAMETER DEFINITION	VALUE	UNITS	RATIONALE/ REFERENCE	INTAKE EQUATION/ MODEL NAME
DERMAL	TRESPASSER	ADULT (ages 19 and above) (Swimming and Wading)	INNER COVE OUTER COVE	CW	CHEMICAL CONCENTRATION IN WATER	chemical-specific	mg/l	EPC Table	INTAKE-DERMAL = CW x SA x PCevent x EF x ED x CF x 1/BW x 1/AT
				PCevent	PERMEABILITY CONSTANT PER EVENT	chemical-specific	cm	USEPA, 2001	PCevent = PC x ET; calculated in PCevent table
				SA	SKIN SURFACE AREA AVAILABLE FOR C	12130	cm2	USEPA, 2001[8]	
				ET	EXPOSURE TIME	1.5	hr/event	USEPA, 1997[5]	
				EF	EXPOSURE FREQUENCY	34	event/yr	Professional Judgement[3]	
				ED	EXPOSURE DURATION	4	yr	USEPA, 1994[4,6]	
				BW	BODY WEIGHT	70	kg	USEPA, 1994	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	1460	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.001	l/cm3		
		ADOLESCENT (ages 7 - 18) (Swimming and Wading)	INNER COVE OUTER COVE	CW	CHEMICAL CONCENTRATION IN WATER	chemical-specific	mg/l	EPC Table	INTAKE-DERMAL = CW x SA x PCevent x EF x ED x CF x 1/BW x 1/AT
				PCevent	PERMEABILITY CONSTANT PER EVENT	chemical-specific	cm	USEPA, 2001	PCevent = PC x ET; calculated in PCevent table
				SA	SKIN SURFACE AREA AVAILABLE FOR C	8856	cm2	USEPA, 2001[8]	
				ET	EXPOSURE TIME	1.5	hr/event	USEPA, 1997[5]	
				EF	EXPOSURE FREQUENCY	34	event/yr	Professional Judgement[3]	
				ED	EXPOSURE DURATION	3	yr	USEPA, 1994[6]	
				BW	BODY WEIGHT	45	kg	USEPA, 1997[7]	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	1095	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.001	l/cm3		
	COMMERCIAL/INDUSTRIAL WORKER	ADULT (ages 19 and above) (Wading only)	INNER COVE OUTER COVE	CW	CHEMICAL CONCENTRATION IN WATER	chemical-specific	mg/l	EPC Table	INTAKE-DERMAL = CW x SA x PCevent x EF x ED x CF x 1/BW x 1/AT
				PCevent	PERMEABILITY CONSTANT PER EVENT	chemical-specific	cm	USEPA, 2001	PCevent = PC x ET; calculated in PCevent table
				SA	SKIN SURFACE AREA AVAILABLE FOR C	4860	cm2	USEPA, 1997[10]	
				ET	EXPOSURE TIME	1	hr/event	Professional Judgement	
				EF	EXPOSURE FREQUENCY	8.5	event/yr	Professional Judgement[9]	
				ED	EXPOSURE DURATION	12.5	yr	USEPA, 1994[6]	
				BW	BODY WEIGHT	70	kg	USEPA, 1994	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	4562.5	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.001	l/cm3		

USEPA, 1988. Superfund Exposure Assessment Manual. Office of Remedial Response; EPA/540/1-88/001; Washington, D.C.
USEPA, 1989. "Risk Assessment Guidance for Superfund, Volume 1, Human Health Evaluation Manual (Part A)"; Office of Emergency and Remedial Response; EPA-540/1-89/002 (interim final); Washington, D.C., December.
USEPA, 1994. "Risk Updates No. 2"; USEPA Region I, Waste Management Division; August. Values from "Attachment 2" to Risk Updates No. 2.
USEPA, 1997. "Exposure Factors Handbook, Volume 1"; Office of Research and Development; EPA-600/P-95/002Fa; Washington, D.C.; August.
USEPA, 2001. "Risk Assessment Guidance for Superfund. Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim. EPA/540/R/99/005.

1 - Value for swimming used
2 - 100% of daily incidental intake of surface water is attributable to incidental ingestion at the Site.
3 - Receptor assumed to visit area to wade or swim 2 days per week, mid May through mid September. Wading is assumed to occur both days and swimming occurs on one of those days. Sediment contact would occur during wading and swimming activites.
4 - Representing ages 19 and above of a 30-year residential exposure duration.
5 - Recommended value for swimming exposures.
6 - The total RME exposure duration is 30 years, consistent with USEPA, 1994. The allocation of exposure duration for the three age groups is based on professional judgement.
7 - Values are the average of 50th percentile body weights for males and females ages 7 through 18.
8 - Value represents a weighted average for swimming and wading scenarios. Whole-body surface area values used for exposures during swimming (17 days); value for the adolescent is the average of 50th percentile whole-body surface areas of males ages 7 through 18 (14,197 cm^2). Surface area values used for exposure during wading (17 days) are the 50th percentile surface areas of males ages 7 though 18 for the hands, lower legs and feet (3,574 cm^2). Whole-body surface area values used for exposures during swimming (17 days); value for the adult is 19,400 cm^2. Surface area values used for exposure during wading (17 days) for the adult assume hands, lower legs and feet (4,860 cm^2).
9 - Receptor assumed to wade 1 day every other week, mid May to mid September.
10 - Surface area values used for the adult assume hands, lower legs, and feet.
mg - milligrams
cm^2 - square centimeters
cm^3 - cubic centimeters
l - liter
kg - kilograms

Table 11
CT Values Used For Daily Intake Calculations - Sediment
Supplemental Site Investigation Report
Former Gorham Manufacturing Site
333 Adelaide Avenue
Providence, Rhode Island

SCENARIO TIMEFRAME: CURRENT/FUTURE
MEDIUM: SEDIMENT
EXPOSURE MEDIUM: SEDIMENT

EXPOSURE ROUTE	RECEPTOR POPULATION	RECEPTOR AGE	EXPOSURE POINT	PARAMETER CODE	PARAMETER DEFINITION	VALUE	UNITS	RATIONALE/ REFERENCE	INTAKE EQUATION/ MODEL NAME
INGESTION	TRESPASSER	ADULT	INNER COVE	CS	CHEMICAL CONCENTRATION IN SEDIME	chemical-specific	mg/kg	EPC Table	INTAKE-INGESTION =
		(ages 19 and above	OUTER COVE	IR-S	INGESTION RATE OF SEDIMENT	100	mg/day	USEPA, 1994[1]	CS x IR-S x FI x EF x ED x CF x 1/BW x 1/AT
				FI	FRACTION INGESTED	1	unitless	Professional Judgement	
				EF	EXPOSURE FREQUENCY	34	day/yr	Professional Judgement[3]	
				ED	EXPOSURE DURATION	4	yr	USEPA, 1994[4,5]	
				BW	BODY WEIGHT	70	kg	USEPA, 1994	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	1460	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.000001	kg/mg		
		ADOLESCENT	INNER COVE	CS	CHEMICAL CONCENTRATION IN SEDIME	chemical-specific	mg/kg	EPC Table	INTAKE-INGESTION =
		(ages 7 - 18)	OUTER COVE	IR-S	INGESTION RATE OF SEDIMENT	100	mg/day	USEPA, 1994[1]	CS x IR-S x FI x EF x ED x CF x 1/BW x 1/AT
				FI	FRACTION INGESTED	1	unitless	Professional Judgement	
				EF	EXPOSURE FREQUENCY	34	day/yr	Professional Judgement[3]	
				ED	EXPOSURE DURATION	3	yr	USEPA, 1994[5]	
				BW	BODY WEIGHT	45	kg	USEPA, 1997[6]	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	1095	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.000001	kg/mg		
	COMMERCIAL/INDUSTRIAL	ADULT	INNER COVE	CS	CHEMICAL CONCENTRATION IN SEDIME	chemical-specific	mg/kg	EPC Table	INTAKE-INGESTION =
	WORKER	(ages 19 and above	OUTER COVE	IR-S	INGESTION RATE OF SEDIMENT	50	mg/day	RIDEM, 2004[1]	CS x IR-S x FI x EF x ED x CF x 1/BW x 1/AT
				FI	FRACTION INGESTED	1	unitless	Professional Judgement[2]	
				EF	EXPOSURE FREQUENCY	8.5	day/yr	Professional Judgement[10]	
				ED	EXPOSURE DURATION	12.5	yr	USEPA, 1994	
				BW	BODY WEIGHT	70	kg	USEPA, 1994	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	4562.5	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.000001	kg/mg		
DERMAL	TRESPASSER	ADULT	INNER COVE	CS	CHEMICAL CONCENTRATION IN SEDIME	chemical-specific	mg/kg	EPC Table	INTAKE-DERMAL =
		(ages 19 and above	OUTER COVE	AF	ADHERENCE FACTOR	0.07	mg/cm2	USEPA, 2001[8]	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
		(Wading)		AbF	ABSORPTION FACTOR	chemical-specific	unitless	USEPA, 2001[9]	
				SA	SKIN SURFACE AREA AVAILABLE FOR C	4860	cm2/day	USEPA, 1997[7]	Where DAevent =
				EV	EVENT DAY	1	unitless	Professional Judgement	CS x AF x AbF x CF
				EF	EXPOSURE FREQUENCY	34	day/yr	Professional Judgement[3]	
				ED	EXPOSURE DURATION	4	yr	USEPA, 1994[4,5]	
				BW	BODY WEIGHT	70	kg	USEPA, 1994	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	1460	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.000001	kg/mg		
		ADOLESCENT	INNER COVE	CS	CHEMICAL CONCENTRATION IN SEDIME	chemical-specific	mg/kg	EPC Table	INTAKE-DERMAL =
		(ages 7 - 18)	OUTER COVE	AF	ADHERENCE FACTOR	0.2	mg/cm2	USEPA, 2001[8]	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
		(Wading)		AbF	ABSORPTION FACTOR	chemical-specific	unitless	USEPA, 2001[9]	
				SA	SKIN SURFACE AREA AVAILABLE FOR C	3574	cm2/day	USEPA, 1997[7]	Where DAevent =
				EV	EVENT DAY	1	unitless	Professional Judgement	CS x AF x AbF x CF
				EF	EXPOSURE FREQUENCY	34	day/yr	Professional Judgement[3]	
				ED	EXPOSURE DURATION	3	yr	USEPA, 1994[5]	
				BW	BODY WEIGHT	45	kg	USEPA, 1997[6]	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	1095	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.000001	kg/mg		

Table 11
CT Values Used For Daily Intake Calculations - Sediment
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Former Gorham Manufacturing Site
333 Adelaide Avenue
Providence, Rhode Island

SCENARIO TIMEFRAME: CURRENT/FUTURE
MEDIUM: SEDIMENT
EXPOSURE MEDIUM: SEDIMENT

EXPOSURE ROUTE	RECEPTOR POPULATION	RECEPTOR AGE	EXPOSURE POINT	PARAMETER CODE	PARAMETER DEFINITION	VALUE	UNITS	RATIONALE/ REFERENCE	INTAKE EQUATION/ MODEL NAME
DERMAL (cont)	COMMERCIAL/INDUSTRIAL WORKER	ADULT (ages 19 and above	INNER COVE OUTER COVE	CS	CHEMICAL CONCENTRATION IN SEDIME	chemical-specific	mg/kg	EPC Table	INTAKE-DERMAL =
				AF	ADHERENCE FACTOR	0.07	mg/cm2	USEPA, 2001[8]	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
				AbF	ABSORPTION FACTOR	chemical-specific	unitless	USEPA, 2001[9]	
				SA	SKIN SURFACE AREA AVAILABLE FOR C	4860	cm2/day	USEPA, 1997[7]	Where DAevent =
				EV	EVENT DAY	1	unitless	Professional Judgement	CS x AF x AbF x CF
				EF	EXPOSURE FREQUENCY	8.5	day/yr	Professional Judgement[10]	
				ED	EXPOSURE DURATION	12.5	yr	USEPA, 1994	
				BW	BODY WEIGHT	70	kg	USEPA, 1994	
				AT-C	AVERAGING TIME (CANCER)	25550	day	USEPA, 1989	
				AT-N	AVERAGING TIME (NONCANCER)	4562.5	day	USEPA, 1989	
				CF	CONVERSION FACTOR	0.000001	kg/mg		

RIDEM, 2004. "Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases". State of Rhode Island and Providence Plantations Department of Environmental Management, Office of Waste Management. February.

USEPA, 1989. "Risk Assessment Guidance for Superfund, Volume 1, Human Health Evaluation Manual (Part A)"; Office of Emergency and Remedial Response; EPA-540/1-89/002 (interim final); Washington, D.C., December.

USEPA, 1994. "Risk Updates No. 2"; USEPA Region I, Waste Management Division; August. Values from "Attachment 2" to Risk Updates No. 2.

USEPA, 1997. "Exposure Factors Handbook, Volume 1"; Office of Research and Development; EPA-600/P-95/002Fa; Washington, D.C.; August.

USEPA, 2001. "Risk Assessment Guidance for Superfund. Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim. EPA/540/R/99/005.

1 - Soil ingestion rate used because ingestion rates for sediment are not available.

2 - 50% of daily incidental intake of soil and sediment is attributable to incidental sediment ingestion.

3 - Receptor assumed to visit area to wade or swim 2 days per week, mid May through mid September. Wading is assumed to occur both days and swimming occurs on one of those days. Sediment contact would occur during wading and swimming activites.

4 - Representing ages 19 and above of a 30-year residential exposure duration.

5 - The total RME exposure duration is 30 years, consistent with USEPA, 1994. The allocation of exposure duration for the three age groups is based on professional judgement.

6 - Values are the average of 50th percentile body weights for males and females ages 7 through 18.

7 - Values are the average of 50th percentile body surface areas (sum of areas for hands, lower legs, and feet) for males in the various age groups indicated.

8 - Values for residential exposure to soil used as conservative estimate of potential sediment adherence; sediment is submerged, so adherence is unlikely.

9 - Values are provided (Table 3-4 of USEPA, 2001) for arsenic, TCDD, PAHs A single value is listed for all other SVOCs. No values are listed for VOCs,or other inorganics and, subsequently, no value will be assigned to the ABSd term for COPCs falling into those categories.

10 - Receptor assumed to wade 1 day every other week, mid May to mid September.

mg - milligrams

cm^2 - square centimeters

kg - kilograms

Table 12
Exposure Point Concentration Summary - Surface Water
Supplemental Site Investigation Report
Former Gorham Manufacturing Site
333 Adelaide Avenue
Providence, Rhode Island

Exposure Point	Chemical of Potential Concern (1)	Arithmetic Mean	95% UCL (2) (calculation)	Maximum Detected Concentration	Exposure Point Concentration			
					Reasonable Maximum (3)		Central Tendency (4)	
					Value	Statistic	Value	Statistic
Inner Cove	**Volatile Organics (mg/L)**							
	cis-1,2-Dichloroethene	0.0046	0.0052 N [a]	0.0062	0.0052	UCL	0.0046	Mean
	Tetrachloroethene	0.00056	0.00067 NP [b]	0.0012	0.00067	UCL	0.00056	Mean
	Trichloroethene	0.0013	0.0017 N [a]	0.0029	0.0017	UCL	0.0013	Mean
	Vinyl chloride	0.0013	0.0016 N [a]	0.0021	0.0016	UCL	0.0013	Mean
	Semivolatile Organics (mg/L)							
	Benzo(a)anthracene	0.00011	0.00012 NP [b]	0.0002	0.00012	UCL	0.00011	Mean
	Benzo(a)pyrene	0.00011	0.00013 NP [b]	0.00024	0.00013	UCL	0.00011	Mean
	Dibenz(a,h)anthracene	0.00012	0.00015 NP [b]	0.00031	0.00015	UCL	0.00012	Mean
	Metals, Total (mg/L)							
	Lead	0.011	0.026 NP [c]	0.0318	0.026	UCL	0.011	Mean
	Dioxins/Furans (mg/L)							
	TEQ-Mammal	0.000000038	NC	0.000000062	0.000000062	Max	0.000000038	Mean
Outer Cove	**Volatile Organics (mg/L)**							
	cis-1,2-Dichloroethene	0.0048	NC	0.011	0.011	Max	0.0048	Mean
	Tetrachloroethene	0.00050	NC	ND	0.00050	Mean	0.00050	Mean
	Trichloroethene	0.0011	NC	0.0023	0.0023	Max	0.0011	Mean
	Vinyl chloride	0.00050	NC	ND	0.00050	Mean	0.00050	Mean
	Semivolatile Organics (mg/L)							
	Benzo(a)anthracene	0.00010	NC	ND	0.00010	Mean	0.00010	Mean
	Benzo(a)pyrene	0.00010	NC	ND	0.00010	Mean	0.00010	Mean
	Dibenz(a,h)anthracene	0.00010	NC	ND	0.00010	Mean	0.00010	Mean
	Metals, Total (mg/L)							
	Lead	0.0025	NC	ND	0.0025	Mean	0.0025	Mean
	Dioxins/Furans (mg/L)							
	TEQ-Mammal	0.000000013	NC	0.000000013	0.000000013	Max	0.000000013	Max

(1) Chemicals of Potential Concern (COPCs) are identified in the COPC selection tables.
(2) 95 % UCL is calculated using ProUCL software (V. 3.02); calculations presented in Appendix C.
N - Normal distribution
[a] - Student's-t UCL
NP - Non-Parametric distribution
[b] - Mod-t UCL (Adjusted for skewness)
[c] - 95% Chebyshev (Mean, Sd) UCL
(3) Reasonable Maximum Exposure (RME) concentration is the lesser of the maximum or 95% UCL.
If analyte is not detected and UCL not calculated then RME is the mean.
(4) Central Tendency Exposure (CTE) concentration is the lesser of the arithmetic mean or maximum.

UCL - Upper Confidence Level
ND - Not Detected
NC - Not Calculated due to number of samples less than 10.
mg/L - milligrams per liter

Table 13
Exposure Point Concentration Summary - Sediment
Supplemental Site Investigation Report
Former Gorham Manufacturing Site
333 Adelaide Avenue
Providence, Rhode Island

Exposure Point	Chemical of Potential Concern (1)	Arithmetic Mean	95% UCL (2) (calculation)		Maximum Detected Concentration	Exposure Point Concentration			
						Reasonable Maximum (3)		Central Tendency (4)	
						Value	Statistic	Value	Statistic
Inner Cove	**Volatile Organics (mg/kg)**								
	cis-1,2-Dichloroethene	13.7	173	NP [a]	175	173	UCL	13.7	Mean
	s-Butylbenzene	0.037	0.28	NP [b]	0.0303	0.030	Max	0.030	Max
	Tetrachloroethene	0.90	9.1	NP [b]	18.1	9.1	UCL	0.90	Mean
	Trichloroethene	3.7	40.3	NP [a]	58.4	40.3	UCL	3.7	Mean
	Vinyl chloride	2.2	14.5	NP [b]	24.8	14.5	UCL	2.2	Mean
	Semivolatile Organics (mg/kg)								
	Benzo(a)anthracene	1.1	2.3	LN [d]	15.1	2.3	UCL	1.1	Mean
	Benzo(a)pyrene	0.68	1.6	LN [d]	7.87	1.6	UCL	0.68	Mean
	Benzo(b)fluoranthene	1.2	2.3	G [e]	14.8	2.3	UCL	1.2	Mean
	Dibenzo(a,h)anthracene	0.11	0.19	LN [d]	1.45	0.19	UCL	0.11	Mean
	Indeno(1,2,3-cd)pyrene	0.24	0.48	LN [d]	2.47	0.48	UCL	0.24	Mean
	PCBs (mg/kg)								
	Aroclor-1254	0.098	0.14	G [f]	0.53	0.14	UCL	0.098	Mean
	Inorganics (mg/kg)								
	Arsenic	17.9	28.6	G [f]	45	28.6	UCL	17.9	Mean
	Cadmium	2.9	4.3	G [f]	7.11	4.3	UCL	2.9	Mean
	Chromium	231	385	G [f]	640	385	UCL	231	Mean
	Copper	1185	3106	NP [b]	2670	2670	Max	1185	Mean
	Lead	423	551	NP [c]	1120	551	UCL	423	Mean
	Mercury	0.50	0.85	G [f]	2.52	0.85	UCL	0.50	Mean
	Nickel	161	281	G [f]	853	281	UCL	161	Mean
	Silver	83.5	234	NP [b]	227	227	Max	83	Mean
	Dioxins/Furans (mg/kg)								
	TEQ-Mammal	0.00065	0.0013	G [e]	0.0036	0.0013	UCL	0.00065	Mean
Outer Cove	**Volatile Organics (mg/kg)**								
	cis-1,2-Dichloroethene	0.0024	NC		ND	0.0024	Mean	0.0024	Mean
	s-Butylbenzene	0.0024	NC		ND	0.0024	Mean	0.0024	Mean
	Tetrachloroethene	0.0024	NC		ND	0.0024	Mean	0.0024	Mean
	Trichloroethene	0.0024	NC		ND	0.0024	Mean	0.0024	Mean
	Vinyl chloride	0.0049	NC		ND	0.0049	Mean	0.0049	Mean
	Semivolatile Organics (mg/kg)								
	Benzo(a)anthracene	0.24	NC		0.69	0.69	Max	0.24	Mean
	Benzo(a)pyrene	0.30	NC		0.86	0.86	Max	0.30	Mean
	Benzo(b)fluoranthene	0.49	NC		1.4	1.4	Max	0.49	Mean
	Dibenzo(a,h)anthracene	0.037	NC		0.081	0.081	Max	0.037	Mean
	Indeno(1,2,3-cd)pyrene	0.10	NC		0.26	0.26	Max	0.10	Mean
	PCBs (mg/kg)								
	Aroclor-1254	0.039	NC		ND	0.039	Mean	0.039	Mean
	Inorganics (mg/kg)								
	Arsenic	4.4	NC		11.5	11.5	Max	4.4	Mean
	Cadmium	0.42	NC		ND	0.42	Mean	0.42	Mean
	Chromium	4.9	NC		7.0	7.0	Max	4.9	Mean
	Copper	7.3	NC		12.5	13	Max	7.3	Mean
	Lead	9.1	NC		20.7	21	Max	9.1	Mean
	Mercury	0.024	NC		ND	0.024	Mean	0.024	Mean
	Nickel	9.7	NC		22.5	23	Max	9.7	Mean
	Silver	0.42	NC		ND	0.42	Mean	0.42	Mean
	Dioxins/Furans (mg/kg)								
	TEQ-Mammal	0.0000045	NC		0.000011	0.000011	Max	0.0000045	Mean

(1) Chemicals of Potential Concern (COPCs) are identified in the COPC selection tables.
(2) 95 % UCL is calculated using ProUCL software (V. 3.02); calculations presented in Appendix C.
NP - Non-Parametric distribution
[a] - Hall's Bootstrap UCL
[b] - 99% Chebyshev (Mean, Sd) UCL
N - Normal distribution
[c] - Student's-t UCL
LN - Log-normal distribution
[d] - 95% Chebyshev (MVUE) UCL
G - Gamma Distribution
[e] - Adjusted Gamma UCL
[f] - Approximate Gamma UCL
(3) Reasonable Maximum Exposure (RME) concentration is the lesser of the maximum or 95% UCL.
If analyte is not detected and UCL not calculated then RME is the mean.
(4) Central Tendency Exposure (CTE) concentration is the lesser of the arithmetic mean or maximum.

UCL - Upper Confidence Level
ND - Not Detected
NC - Not Calculated due to number of samples less than 10.
mg/kg - milligrams per kilogram

Table 14
Risk Assessment Summary - Reasonable Maximum Exposure
Supplemental Site Investigation Report
Former Gorham Manufacturing Site
333 Adelaide Avenue
Providence, Rhode Island

Exposure Scenario	Receptor	Exposure Point	Exposure Route	Excess Lifetime Cancer Risk	Hazard Index
Current/Future - Inner Cove					
Trespasser	Older Child (ages 7 through 18)	Sediment	Incidental ingestion	2E-05	0.1
			Dermal contact	5E-07	0.003
		Surface water	Incidental ingestion	1E-07	0.001
			Dermal contact	3E-07	0.004
			Total Risk:	**2E-05**	**0.2**
Trespasser	Adult (ages 19 and above)	Sediment	Incidental ingestion	1E-05	0.09
			Dermal contact	4E-07	0.003
		Surface water	Incidental ingestion	7E-08	0.0009
			Dermal contact	3E-07	0.003
			Total Risk:	**1E-05**	**0.1**
			Total Receptor Risk:	**3E-05**	**NC**
Commercial/Industrial Worker	Adult (ages 19 and above)	Sediment	Incidental ingestion	4E-06	0.02
			Dermal contact	8E-08	0.0003
		Surface water	Incidental ingestion	4E-08	0.0002
			Dermal contact	8E-08	0.0005
			Total Risk:	**4E-06**	**0.02**
			Total Receptor Risk:	**4E-06**	**NC**

Table 14
Risk Assessment Summary - Reasonable Maximum Exposure
Supplemental Site Investigation Report
Former Gorham Manufacturing Site
333 Adelaide Avenue
Providence, Rhode Island

Exposure Scenario	Receptor	Exposure Point	Exposure Route	Excess Lifetime Cancer Risk	Hazard Index
Current/Future - Pond (Outer Cove)					
Trespasser	Older Child (ages 7 through 18)	Sediment	Incidental ingestion	1E-06	0.01
			Dermal contact	2E-07	0.001
		Surface water	Incidental ingestion	7E-08	0.002
			Dermal contact	2E-07	0.005
			Total Risk:	**2E-06**	**0.02**
Trespasser	Adult (ages 19 and above)	Sediment	Incidental ingestion	9E-07	0.009
			Dermal contact	2E-07	0.001
		Surface water	Incidental ingestion	4E-08	0.001
			Dermal contact	2E-07	0.004
			Total Risk:	**1E-06**	**0.02**
			Total Receptor Risk:	**3E-06**	**NC**
Commercial/Industrial Worker	Adult (ages 19 and above)	Sediment	Incidental ingestion	3E-07	0.001
			Dermal contact	4E-08	0.00009
		Surface water	Incidental ingestion	2E-08	0.0003
			Dermal contact	6E-08	0.001
			Total Risk:	**4E-07**	**0.003**
			Total Receptor Risk:	**4E-07**	**NC**

Risk calculations are presented in Appendix D.
NC = Not calculated because Hazard Index is not summed across age groups.

Table 15
Risk Assessment Summary - Central Tendency
Supplemental Site Investigation Report
Former Gorham Manufacturing Site
333 Adelaide Avenue
Providence, Rhode Island

Exposure Scenario	Receptor	Exposure Point	Exposure Route	Excess Lifetime Cancer Risk	Hazard Index
Current/Future - Inner Cove					
Trespasser	Older Child (ages 7 through 18)	Sediment	Incidental ingestion	1E-06	0.04
			Dermal contact	4E-08	0.001
		Surface water	Incidental ingestion	2E-08	0.001
			Dermal contact	5E-08	0.003
			Total Risk:	**1E-06**	**0.04**
Trespasser	Adult (ages 19 and above)	Sediment	Incidental ingestion	1E-06	0.03
			Dermal contact	5E-08	0.001
		Surface water	Incidental ingestion	2E-08	0.0005
			Dermal contact	6E-08	0.002
			Total Risk:	**1E-06**	**0.03**
			Total Receptor Risk:	**2E-06**	**NC**
Commercial/Industrial Worker	Adult (ages 19 and above)	Sediment	Incidental ingestion	4E-07	0.003
			Dermal contact	1E-08	0.00008
		Surface water	Incidental ingestion	8E-09	0.00004
			Dermal contact	6E-08	0.0004
			Total Risk:	**5E-07**	**0.004**
			Total Receptor Risk:	**5E-07**	**NC**

Table 15
Risk Assessment Summary - Central Tendency
Supplemental Site Investigation Report
Former Gorham Manufacturing Site
333 Adelaide Avenue
Providence, Rhode Island

Exposure Scenario	Receptor	Exposure Point	Exposure Route	Excess Lifetime Cancer Risk	Hazard Index
Current/Future - Outer Cove					
Trespasser	Older Child (ages 7 through 18)	Sediment	Incidental ingestion	9E-08	0.004
			Dermal contact	1E-08	0.0004
		Surface water	Incidental ingestion	9E-09	0.0007
			Dermal contact	4E-08	0.002
			Total Risk:	**2E-07**	**0.007**
Trespasser	Adult (ages 19 and above)	Sediment	Incidental ingestion	8E-08	0.003
			Dermal contact	2E-08	0.0003
		Surface water	Incidental ingestion	8E-09	0.0004
			Dermal contact	5E-08	0.002
			Total Risk:	**1E-07**	**0.005**
			Total Receptor Risk:	**3E-07**	**NC**
Commercial/Industrial Worker	Adult (ages 19 and above)	Sediment	Incidental ingestion	3E-08	0.0003
			Dermal contact	3E-09	0.00002
		Surface water	Incidental ingestion	4E-09	0.0001
			Dermal contact	1E-08	0.0002
			Total Risk:	**5E-08**	**0.0006**
			Total Receptor Risk:	**5E-08**	**NC**

Risk calculations are presented in Appendix D.
NC = Not calculated because Hazard Index is not summed across age groups.

Table 16
Calculations of Blood Lead Concentrations (PbBs) - Trespasser
Supplemental Site Investigation Report
Former Gorham Manufacturing Site
333 Adelaide Avenue
Providence, Rhode Island

Exposure Variable	PbB Equation[1] 1*	2**	Description of Exposure Variable	Units	Values for Non-Residential Exposure Scenario Using Equation 1 GSDi = Hom	GSDi = Het
PbS[2]	X	X	Soil lead concentration	ug/g or ppm	551	551
$R_{fetal/maternal}$	X	X	Fetal/maternal PbB ratio	--	0.9	0.9
BKSF	X	X	Biokinetic Slope Factor	ug/dL per ug/day	0.4	0.4
GSD_i	X	X	Geometric standard deviation PbB	--	2.1	2.3
PbB_0	X	X	Baseline PbB	ug/dL	1.5	1.7
IR_S	X		Soil ingestion rate (including soil-derived indoor dust)	g/day	0.050	0.050
IR_{S+D}		X	Total ingestion rate of outdoor soil and indoor dust	g/day	--	--
W_S		X	Weighting factor; fraction of IR_{S+D} ingested as outdoor soil	--	--	--
K_{SD}		X	Mass fraction of soil in dust	--	--	--
$AF_{S,D}$	X	X	Absorption fraction (same for soil and dust)	--	0.12	0.12
$EF_{S,D}$	X	X	Exposure frequency (same for soil and dust)	days/yr	51	51
$AT_{S,D}$	X	X	Averaging time (same for soil and dust)	days/yr	365	365
PbB_{adult}	**PbB of trespasser, geometric mean**			**ug/dL**	**1.7**	**1.9**
$PbB_{fetal,0.95}$	**95th percentile PbB among fetuses of adult workers**			**ug/dL**	**5.1**	**6.7**
PbB_t	**Target PbB level of concern (e.g., 10 ug/dL)**			**ug/dL**	**10.0**	**10.0**
$P(PbB_{fetal} > PbB_t)$	**Probability that fetal PbB > PbB_t, assuming lognormal distribution**			**%**	**0.6%**	**1.7%**

[1] Equation 1 does not apportion exposure between soil and dust ingestion (excludes W_SK_{SD}).
When $IR_S = IR_{S+D}$ and $W_S = 1.0$, the equations yield the same $PbB_{fetal,0.95}$.

[2] Reasonable Maximum Exposure concentration for lead presented on Table SED-EPC.

***Equation 1, based on Eq. 1, 2 in USEPA (1996).**

PbB_{adult} =	$(PbS*BKSF*IR_{S+D}*AF_{S,D}*EF_S/AT_{S,D}) + PbB_0$
$PbB_{fetal,0.95}$ =	$PbB_{adult} * (GSD_i^{1.645} * R)$

Source: U.S. EPA (1996). Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil

Table 17
Calculations of Blood Lead Concentrations (PbBs) for Commercial/Industrial Worker
Supplemental Site Investigation Report
Former Gorham Manufacturing Site
333 Adelaide Avenue
Providence, Rhode Island

Exposure Variable	PbB Equation[1] 1*	PbB Equation[1] 2**	Description of Exposure Variable	Units	Values for Non-Residential Exposure Scenario Using Equation 1 GSDi = Hom	GSDi = Het
PbS^2	X	X	Soil lead concentration	ug/g or ppm	551	551
$R_{fetal/maternal}$	X	X	Fetal/maternal PbB ratio	--	0.9	0.9
BKSF	X	X	Biokinetic Slope Factor	ug/dL per ug/day	0.4	0.4
GSD_i	X	X	Geometric standard deviation PbB	--	2.1	2.3
PbB_0	X	X	Baseline PbB	ug/dL	1.5	1.7
IR_S	X		Soil ingestion rate (including soil-derived indoor dust)	g/day	0.050	0.050
IR_{S+D}		X	Total ingestion rate of outdoor soil and indoor dust	g/day	--	--
W_S		X	Weighting factor; fraction of IR_{S+D} ingested as outdoor soil	--	--	--
K_{SD}		X	Mass fraction of soil in dust	--	--	--
$AF_{S,D}$	X	X	Absorption fraction (same for soil and dust)	--	0.12	0.12
$EF_{S,D}$	X	X	Exposure frequency (same for soil and dust)	days/yr	17	17
$AT_{S,D}$	X	X	Averaging time (same for soil and dust)	days/yr	365	365
PbB_{adult}	**PbB of adult worker, geometric mean**			**ug/dL**	**1.6**	**1.8**
$PbB_{fetal,0.95}$	**95th percentile PbB among fetuses of adult workers**			**ug/dL**	**4.8**	**6.2**
PbB_t	**Target PbB level of concern (e.g., 10 ug/dL)**			**ug/dL**	**10.0**	**10.0**
$P(PbB_{fetal} > PbB_t)$	**Probability that fetal PbB > PbB_t, assuming lognormal distribution**			**%**	**0.4%**	**1.4%**

[1] Equation 1 does not apportion exposure between soil and dust ingestion (excludes W_S, K_{SD}).
When $IR_S = IR_{S+D}$ and $W_S = 1.0$, the equations yield the same $PbB_{fetal,0.95}$.

[2] Reasonable Maximum Exposure concentration for lead presented on Table SED-EPC.

***Equation 1, based on Eq. 1, 2 in USEPA (1996).**

PbB_{adult} =	$(PbS*BKSF*IR_{S+D}*AF_{S,D}*EF_S/AT_{S,D}) + PbB_0$
$PbB_{fetal,0.95}$ =	$PbB_{adult} * (GSD_i^{1.645} * R)$

Source: U.S. EPA (1996). Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil

APPENDIX A

Analytical Data Used in the Risk Assessment

Table A1
Surface Water Data
Supplemental Site Investigation Report
Former Gorham Manufacturing Site
333 Adelaide Avenue
Providence, Rhode Islande

Parameter	SW10 SW10 6/21/2006	SW11 SW11 6/21/2006	SW12 SW12 6/21/2006	SW16 SW16 6/21/2006	SW17 SW17 6/21/2006	SW18 SW18 6/21/2006	SW19 SW19 6/21/2006	SW20 SW20 6/21/2006	SW21 SW21 6/21/2006	SW22 SW22 6/21/2006	SW23 SW23 6/21/2006	SW24 SW24 6/21/2006	SW25 SW25 6/22/2006
Volatile Organics (mg/L)													
1,1,1,2-Tetrachloroethane	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
1,1,1-Trichloroethane	<0.001	<0.001	<0.001	0.0016	0.0018	0.0013	0.0014	<0.001	0.0012	0.001	0.001	0.0013	0.0018
1,1,2,2-Tetrachloroethane	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1,2-Trichloroethane	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
1,1-Dichloroethane	<0.001	<0.001	<0.001	0.0011	0.0014	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0012
1,1-Dichloroethene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
1,1-Dichloropropene	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
1,2,3-Trichlorobenzene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
1,2,3-Trichloropropane	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
1,2,4-Trichlorobenzene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
1,2,4-Trimethylbenzene	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
1,2-Dibromo-3-chloropropane	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
1,2-Dibromoethane	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
1,2-Dichlorobenzene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
1,2-Dichloroethane	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
1,2-Dichloropropane	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
1,3,5-Trimethylbenzene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
1,3-Dichlorobenzene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
1,3-Dichloropropane	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
1,4-Dichlorobenzene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
1,4-Dioxane	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1-Chlorohexane	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
2,2-Dichloropropane	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
2-Butanone	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
2-Chlorotoluene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
2-Hexanone	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
4-Chlorotoluene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
4-Isopropyltoluene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
4-Methyl-2-pentanone	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
Acetone	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
Benzene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Bromobenzene	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Bromochloromethane	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Bromodichloromethane	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Bromoform	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Bromomethane	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Carbon disulfide	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Carbon tetrachloride	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chlorobenzene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chloroethane	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chloroform	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chloromethane	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
cis-1,2-Dichloroethene	0.0022	0.0108	0.0015	0.0045	0.0045	0.0048	0.0062	0.0025	0.0054	0.0044	0.0044	0.0059	0.0045
cis-1,3-Dichloropropene	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Dibromochloromethane	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

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Dibromomethane	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Dichlorodifluoromethane	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Diethyl ether	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Diisopropyl ether	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Ethyl tertiary-butyl ether	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Ethylbenzene	<0.001	<0.001	<0.001	0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Hexachlorobutadiene	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006
Isopropylbenzene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Methyl tert-butyl ether	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Methylene chloride	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Naphthalene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
n-Butylbenzene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
n-Propylbenzene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
sec-Butylbenzene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Styrene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
tert-Butylbenzene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Tertiary-amyl methyl ether	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Tetrachloroethene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0012	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Tetrahydrofuran	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Toluene	<0.001	<0.001	<0.001	0.0043	0.0043	0.0024	0.0034	0.0017	0.0011	0.0014	0.0019	0.0029	0.0033
trans-1,2-Dichloroethene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
trans-1,3-Dichloropropene	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Trichloroethene	<0.001	0.0023	<0.001	0.001	0.001	0.0015	0.0029	<0.001	0.0016	0.0013	0.0017	0.0014	0.0012
Trichlorofluoromethane	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Vinyl acetate	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Vinyl chloride	<0.001	<0.001	<0.001	0.0015	0.0013	0.0013	0.0021	<0.001	0.0013	0.0011	0.001	0.0018	0.0015
Xylene, M&P-	<0.002	<0.002	<0.002	0.0026	0.0024	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.0023
Xylene, O-	<0.001	<0.001	<0.001	0.0011	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Xylenes, Total	0.003	0.003	0.003	0.0037	0.0034	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
Semivolatile Organics (mg/L)													
2-Methylnaphthalene	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Acenaphthene	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Acenaphthylene	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Anthracene	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Benzo(a)anthracene	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Benzo(a)pyrene	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.00024	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Benzo(b)fluoranthene	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Benzo(g,h,i)perylene	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.00038	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Benzo(k)fluoranthene	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Chrysene	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.00023	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Dibenz(a,h)anthracene	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.00031	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Fluoranthene	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Fluorene	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Indeno(1,2,3-cd)pyrene	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Naphthalene	<0.0002	<0.0002	<0.0002	<0.0002	0.00026	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	0.0003	0.00024
Phenanthrene	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

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Pyrene	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Pesticides/PCBs (mg/L)													
4,4'-DDD		<0.00005					<0.00005						
4,4'-DDE		<0.00005					<0.00005						
4,4'-DDT		0.00008					<0.00005						
Aldrin		<0.00005					<0.00005						
alpha-BHC		<0.00005					<0.00005						
alpha-Chlordane		<0.00005					<0.00005						
beta-BHC		<0.00005					<0.00005						
Chlordane		<0.0005					<0.0005						
delta-BHC		<0.00005					<0.00005						
Dieldrin		<0.00005					<0.00005						
Endosulfan I		<0.00005					<0.00005						
Endosulfan II		<0.00005					<0.00005						
Endosulfan sulfate		<0.00005					<0.00005						
Endrin		<0.00005					<0.00005						
Endrin aldehyde		<0.00005					<0.00005						
Endrin ketone		<0.00005					<0.00005						
gamma-BHC (Lindane)		<0.00005					<0.00005						
gamma-Chlordane		<0.00005					<0.00005						
Heptachlor		<0.00005					<0.00005						
Heptachlor epoxide		<0.00005					<0.00005						
Hexachlorobenzene		<0.00005					<0.00005						
Methoxychlor		<0.00005					<0.00005						
Toxaphene		<0.0025					<0.0025						
Aroclor 1016		<0.0001					<0.0001						
Aroclor 1221		<0.0001					<0.0001						
Aroclor 1232		<0.0001					<0.0001						
Aroclor 1242		<0.0001					<0.0001						
Aroclor 1248		<0.0001					<0.0001						
Aroclor 1254		<0.0001					<0.0001						
Aroclor 1260		<0.0001					<0.0001						
Aroclor 1262		<0.0001					<0.0001						
Aroclor 1268		<0.0001					<0.0001						
Metals, Total (mg/L)													
Antimony	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Arsenic	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Barium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Beryllium	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Chromium	<0.02	<0.02	<0.02	<0.02	<0.02	0.06	<0.02	<0.02	0.034	0.046	<0.02	<0.02	<0.02
Copper	<0.02	<0.02	<0.02	<0.02	<0.02	0.099	0.029	<0.02	0.071	0.126	0.023	<0.02	<0.02
Lead	<0.005	<0.005	<0.005	<0.005	<0.005	0.0318	0.0121	<0.005	0.0258	0.0309	0.0083	<0.005	<0.005
Mercury	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Nickel	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Selenium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

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Parameter	SW10 SW10 6/21/2006	SW11 SW11 6/21/2006	SW12 SW12 6/21/2006	SW16 SW16 6/21/2006	SW17 SW17 6/21/2006	SW18 SW18 6/21/2006	SW19 SW19 6/21/2006	SW20 SW20 6/21/2006	SW21 SW21 6/21/2006	SW22 SW22 6/21/2006	SW23 SW23 6/21/2006	SW24 SW24 6/21/2006	SW25 SW25 6/22/2006
Silver	<0.005	<0.005	<0.005	<0.005	<0.005	0.008	<0.005	<0.005	0.005	0.006	<0.005	<0.005	<0.005
Thallium	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Zinc	<0.05	<0.05	<0.05	<0.05	<0.05	0.107	0.068	<0.05	0.089	0.146	<0.05	<0.05	<0.05
Metals, Dissolved (mg/L)													
Antimony	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Arsenic	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Barium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Beryllium	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Chromium	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Copper	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Lead	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Mercury	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Nickel	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Selenium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Zinc	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Inorganics (mg/L)													
Hardness	70.8	71.9	67	78.4	73.6	87.3	76.1	77.3	86.7	86.7	86.6	83.4	77.7
Dioxins/Furans (mg/L)													
1,2,3,4,6,7,8-HpCDD		0.000000024					0.000000043						
1,2,3,6,7,8-HxCDD		<0.00000001					<0.00000001						
1,2,3,7,8,9-HxCDD		<0.00000001					<0.00000001						
1,2,3,7,8-PeCDD		<0.00000001					<0.00000001						
2,3,7,8-TCDD		<0.0000000021					<0.000000002						
2,3,7,8-TCDF		<0.0000000021					<0.000000002						
OCDD		0.00000018					0.00000032						
Total HpCDD		0.000000043					0.000000072						
Total HpCDF		0.000000012					0.000000021						
Total HxCDD		<0.00000001					<0.00000001						
Total PeCDD		<0.00000001					<0.00000001						
Total PeCDF		<0.00000001					<0.00000001						
Total TCDD		<0.0000000021					<0.000000002						
Total TCDF		<0.0000000021					0.0000000034						
TEQ-Mammal		0.000000013					0.000000013						

< - Compound not detected,
Value is detection limit.
mg/L - milligrams per liter

Table A1
Surface Water Data
Supplemental Site Investigation Report
Former Gorham Manufacturing Site
333 Adelaide Avenue
Providence, Rhode Islande

Parameter	SW26 SW26 6/21/2006	SW27 SW27 6/22/2006
Volatile Organics (mg/L)		
1,1,1,2-Tetrachloroethane	<0.001	<0.001
1,1,1-Trichloroethane	0.0015	0.0018
1,1,2,2-Tetrachloroethane	<0.0005	<0.0005
1,1,2-Trichloroethane	<0.001	<0.001
1,1-Dichloroethane	<0.001	0.0013
1,1-Dichloroethene	<0.001	<0.001
1,1-Dichloropropene	<0.002	<0.002
1,2,3-Trichlorobenzene	<0.001	<0.001
1,2,3-Trichloropropane	<0.001	<0.001
1,2,4-Trichlorobenzene	<0.001	<0.001
1,2,4-Trimethylbenzene	<0.001	0.0011
1,2-Dibromo-3-chloropropane	<0.005	<0.005
1,2-Dibromoethane	<0.001	<0.001
1,2-Dichlorobenzene	<0.001	<0.001
1,2-Dichloroethane	<0.001	<0.001
1,2-Dichloropropane	<0.001	<0.001
1,3,5-Trimethylbenzene	<0.001	<0.001
1,3-Dichlorobenzene	<0.001	<0.001
1,3-Dichloropropane	<0.001	<0.001
1,4-Dichlorobenzene	<0.001	<0.001
1,4-Dioxane	<0.5	<0.5
1-Chlorohexane	<0.001	<0.001
2,2-Dichloropropane	<0.001	<0.001
2-Butanone	<0.025	<0.025
2-Chlorotoluene	<0.001	<0.001
2-Hexanone	<0.01	<0.01
4-Chlorotoluene	<0.001	<0.001
4-Isopropyltoluene	<0.001	<0.001
4-Methyl-2-pentanone	<0.025	<0.025
Acetone	<0.025	<0.025
Benzene	<0.001	<0.001
Bromobenzene	<0.002	<0.002
Bromochloromethane	<0.001	<0.001
Bromodichloromethane	<0.001	<0.001
Bromoform	<0.001	<0.001
Bromomethane	<0.002	<0.002
Carbon disulfide	<0.001	<0.001
Carbon tetrachloride	<0.001	<0.001
Chlorobenzene	<0.001	<0.001
Chloroethane	<0.002	<0.002
Chloroform	<0.001	<0.001
Chloromethane	<0.002	<0.002
cis-1,2-Dichloroethene	0.0025	0.0054
cis-1,3-Dichloropropene	<0.0005	<0.0005
Dibromochloromethane	<0.001	<0.001

Table A1
Surface Water Data
Supplemental Site Investigation Report
Former Gorham Manufacturing Site
333 Adelaide Avenue
Providence, Rhode Islande

Parameter	SW26 SW26 6/21/2006	SW27 SW27 6/22/2006
Dibromomethane	<0.001	<0.001
Dichlorodifluoromethane	<0.002	<0.002
Diethyl ether	<0.001	<0.001
Diisopropyl ether	<0.001	<0.001
Ethyl tertiary-butyl ether	<0.001	<0.001
Ethylbenzene	<0.001	0.001
Hexachlorobutadiene	<0.0006	<0.0006
Isopropylbenzene	<0.001	<0.001
Methyl tert-butyl ether	<0.001	<0.001
Methylene chloride	<0.005	<0.005
Naphthalene	<0.001	<0.001
n-Butylbenzene	<0.001	<0.001
n-Propylbenzene	<0.001	<0.001
sec-Butylbenzene	<0.001	<0.001
Styrene	<0.001	<0.001
tert-Butylbenzene	<0.001	<0.001
Tertiary-amyl methyl ether	<0.001	<0.001
Tetrachloroethene	<0.001	<0.001
Tetrahydrofuran	<0.005	<0.005
Toluene	0.0015	0.0041
trans-1,2-Dichloroethene	<0.001	<0.001
trans-1,3-Dichloropropene	<0.0005	<0.0005
Trichloroethene	<0.001	0.0014
Trichlorofluoromethane	<0.002	<0.002
Vinyl acetate	<0.005	<0.005
Vinyl chloride	<0.001	0.002
Xylene, M&P-	<0.002	0.0028
Xylene, O-	<0.001	0.0012
Xylenes, Total	0.003	0.004
Semivolatile Organics (mg/L)		
2-Methylnaphthalene	<0.0002	<0.0002
Acenaphthene	<0.0002	<0.0002
Acenaphthylene	<0.0002	<0.0002
Anthracene	<0.0002	<0.0002
Benzo(a)anthracene	<0.0002	<0.0002
Benzo(a)pyrene	<0.0002	<0.0002
Benzo(b)fluoranthene	<0.0002	<0.0002
Benzo(g,h,i)perylene	<0.0002	<0.0002
Benzo(k)fluoranthene	<0.00031	<0.0003
Chrysene	<0.0002	<0.0002
Dibenz(a,h)anthracene	<0.0002	<0.0002
Fluoranthene	<0.0002	<0.0002
Fluorene	<0.0002	<0.0002
Indeno(1,2,3-cd)pyrene	<0.00031	<0.0003
Naphthalene	<0.0002	<0.0002
Phenanthrene	<0.0002	<0.0002

Table A1
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Parameter	SW26 SW26 6/21/2006	SW27 SW27 6/22/2006
Pyrene	<0.0002	<0.0002
Pesticides/PCBs (mg/L)		
4,4'-DDD		<0.00005
4,4'-DDE		<0.00005
4,4'-DDT		<0.00005
Aldrin		<0.00005
alpha-BHC		<0.00005
alpha-Chlordane		<0.00005
beta-BHC		<0.00005
Chlordane		<0.0005
delta-BHC		<0.00005
Dieldrin		<0.00005
Endosulfan I		<0.00005
Endosulfan II		<0.00005
Endosulfan sulfate		<0.00005
Endrin		<0.00005
Endrin aldehyde		<0.00005
Endrin ketone		<0.00005
gamma-BHC (Lindane)		<0.00005
gamma-Chlordane		<0.00005
Heptachlor		<0.00005
Heptachlor epoxide		<0.00005
Hexachlorobenzene		<0.00005
Methoxychlor		<0.00005
Toxaphene		<0.0025
Aroclor 1016		<0.0001
Aroclor 1221		<0.0001
Aroclor 1232		<0.0001
Aroclor 1242		<0.0001
Aroclor 1248		<0.0001
Aroclor 1254		<0.0001
Aroclor 1260		<0.0001
Aroclor 1262		<0.0001
Aroclor 1268		<0.0001
Metals, Total (mg/L)		
Antimony	<0.005	<0.005
Arsenic	<0.005	<0.005
Barium	<0.05	<0.05
Beryllium	<0.001	<0.001
Cadmium	<0.005	<0.005
Chromium	<0.02	<0.02
Copper	<0.02	<0.02
Lead	<0.005	<0.005
Mercury	<0.0005	<0.0005
Nickel	<0.05	<0.05
Selenium	<0.05	<0.05

Table A1
Surface Water Data
Supplemental Site Investigation Report
Former Gorham Manufacturing Site
333 Adelaide Avenue
Providence, Rhode Islande

Parameter	SW26 SW26 6/21/2006	SW27 SW27 6/22/2006
Silver	<0.005	<0.005
Thallium	<0.002	<0.002
Zinc	<0.05	<0.05
Metals, Dissolved (mg/L)		
Antimony	<0.005	<0.005
Arsenic	<0.005	<0.005
Barium	<0.05	<0.05
Beryllium	<0.001	<0.001
Cadmium	<0.005	<0.005
Chromium	<0.02	<0.02
Copper	<0.02	<0.02
Lead	<0.005	<0.005
Mercury	<0.0005	<0.0005
Nickel	<0.05	<0.05
Selenium	<0.05	<0.05
Silver	<0.005	<0.005
Thallium	<0.002	<0.002
Zinc	<0.05	<0.05
Inorganics (mg/L)		
Hardness	73.7	80
Dioxins/Furans (mg/L)		
1,2,3,4,6,7,8-HpCDD		0.000000043
1,2,3,6,7,8-HxCDD		0.000000013
1,2,3,7,8,9-HxCDD		0.000000051
1,2,3,7,8-PeCDD		0.000000046
2,3,7,8-TCDD		0.0000000031
2,3,7,8-TCDF		0.0000000089
OCDD		0.00000035
Total HpCDD		0.000000061
Total HpCDF		0.000000013
Total HxCDD		0.000000064
Total PeCDD		0.000000046
Total PeCDF		0.000000029
Total TCDD		0.0000000031
Total TCDF		0.000000032
TEQ-Mammal		0.000000062

< - Compound not detected,
Value is detection limit.
mg/L - milligrams per liter

Table A2
Sediment Data (0-7 ft)
Supplemental Site Investigation Report
Former Gorham Manufacturing Site
333 Adelaide Avenue
Providence, Rhode Island

chemical.name	SD-1001 SD-1001 12/28/2005 0-2	SD-1002 SD-1002 12/28/2005 0-2	SD-1003 SD-1003 12/28/2005 0-2	SD-1004 SD-1004 12/28/2005 0-2	SD-1005 SD-1005 12/28/2005 0-2	SED10 SED1001 6/22/2006 0.5-1	SED10 SED1003 6/22/2006 2.5-3	SED11 SED1101 6/22/2006 0-1	SED11 SED1103 6/22/2006 2.5-3	SED12 SED1201 6/22/2006 0.5-1	SED12 SED1203 6/22/2006 2.5-3
Volatile Organics (mg/kg)											
1,1,1,2-Tetrachloroethane	< 0.013	< 0.0098	< 0.15	< 1.1	< 0.012	< 0.004	< 0.0046	< 0.0427	< 0.0046	< 0.006	< 0.004
1,1,1-Trichloroethane	< 0.013	< 0.0098	< 0.15	1.3	0.3	< 0.004	< 0.0046	< 0.0427	< 0.0046	< 0.006	< 0.004
1,1,2,2-Tetrachloroethane	< 0.013	< 0.0098	< 0.15	< 1.1	< 0.012	< 0.004	< 0.0046	< 0.0427	< 0.0046	< 0.006	< 0.004
1,1,2-Trichloroethane	< 0.013	< 0.0098	< 0.15	< 1.1	< 0.012	< 0.004	< 0.0046	< 0.0427	< 0.0046	< 0.006	< 0.004
1,1-Dichloroethane	< 0.013	< 0.0098	1.4	< 1.1	< 0.012	< 0.004	< 0.0046	< 0.0427	< 0.0046	< 0.006	< 0.004
1,1-Dichloroethene	< 0.013	< 0.0098	< 0.15	< 1.1	0.014	< 0.004	< 0.0046	< 0.0427	< 0.0046	< 0.006	< 0.004
1,1-Dichloropropene	< 0.013	< 0.0098	< 0.15	< 1.1	< 0.012	< 0.004	< 0.0046	< 0.0427	< 0.0046	< 0.006	< 0.004
1,2,3-Trichlorobenzene	< 0.013	< 0.0098	< 0.15	< 1.1	< 0.012	< 0.004	< 0.0046	< 0.0427	< 0.0046	< 0.006	< 0.004
1,2,3-Trichloropropane	< 0.013	< 0.0098	< 0.15	< 1.1	< 0.012	< 0.004	< 0.0046	< 0.0427	< 0.0046	< 0.006	< 0.004
1,2,4-Trichlorobenzene	< 0.013	< 0.0098	< 0.15		< 0.012	< 0.004	< 0.0046	< 0.0427	< 0.0046	< 0.006	< 0.004
1,2,4-Trimethylbenzene	< 0.013	< 0.0098	< 0.15	< 1.1	< 0.012	< 0.004	< 0.0046	< 0.0427	< 0.0046	< 0.006	< 0.004
1,2-Dibromo-3-Chloropropane	< 0.013	< 0.0098	< 0.15	< 1.1	< 0.012	< 0.004	< 0.0046	< 0.0427	< 0.0046	< 0.006	< 0.004
1,2-Dibromoethane	< 0.013	< 0.0098	< 0.15	< 1.1	< 0.012	< 0.004	< 0.0046	< 0.0427	< 0.0046	< 0.006	< 0.004
1,2-Dichlorobenzene	< 0.013	< 0.0098	< 0.15		< 0.012	< 0.004	< 0.0046	< 0.0427	< 0.0046	< 0.006	< 0.004
1,2-Dichloroethane	< 0.013	< 0.0098	< 0.15	< 1.1	< 0.012	< 0.004	< 0.0046	< 0.0427	< 0.0046	< 0.006	< 0.004
1,2-Dichloropropane	< 0.013	< 0.0098	< 0.15	< 1.1	< 0.012	< 0.004	< 0.0046	< 0.0427	< 0.0046	< 0.006	< 0.004
1,3,5-Trimethylbenzene	< 0.013	< 0.0098	< 0.15	< 1.1	< 0.012	< 0.004	< 0.0046	< 0.0427	< 0.0046	< 0.006	< 0.004
1,3-Dichlorobenzene	< 0.013	< 0.0098	< 0.15		< 0.012	< 0.004	< 0.0046	< 0.0427	< 0.0046	< 0.006	< 0.004
1,3-Dichloropropane	< 0.013	< 0.0098	< 0.15	< 1.1	< 0.012	< 0.004	< 0.0046	< 0.0427	< 0.0046	< 0.006	< 0.004
1,4-Dichlorobenzene	< 0.013	< 0.0098	< 0.15		< 0.012	< 0.004	< 0.0046	< 0.0427	< 0.0046	< 0.006	< 0.004
1,4-Dioxane						< 0.201	< 0.231	< 2.14	< 0.228	< 0.302	< 0.198
1-Chlorohexane						< 0.004	< 0.0046	< 0.0427	< 0.0046	< 0.006	< 0.004
2,2-Dichloropropane	< 0.013	< 0.0098	< 0.15	< 1.1	< 0.012	< 0.004	< 0.0046	< 0.0427	< 0.0046	< 0.006	< 0.004
2-Butanone	< 0.026	< 0.02	< 0.3	< 2.3	< 0.024	< 0.0403	< 0.0463	< 0.427	< 0.0457	< 0.0604	< 0.0396
2-Chlorotoluene	< 0.013	< 0.0098	< 0.15	< 1.1	< 0.012	< 0.004	< 0.0046	< 0.0427	< 0.0046	< 0.006	< 0.004
2-Hexanone	< 0.026	< 0.02	< 0.3	< 2.3	< 0.024	< 0.0403	< 0.0463	< 0.427	< 0.0457	< 0.0604	< 0.0396
4-Chlorotoluene	< 0.013	< 0.0098	< 0.15	< 1.1	< 0.012	< 0.004	< 0.0046	< 0.0427	< 0.0046	< 0.006	< 0.004
4-Methyl-2-Pentanone	< 0.026	< 0.02	< 0.3	< 2.3	< 0.024	< 0.0403	< 0.0463	< 0.427	< 0.0457	< 0.0604	< 0.0396
Acetone	< 0.052	< 0.039	0.87	< 4.6	< 0.048	< 0.0403	< 0.0463	0.649	0.079	0.0757	< 0.0396
Acrylonitrile	< 0.065	< 0.049	< 0.76	< 5.7	< 0.06						
Benzene	< 0.013	< 0.0098	< 0.15	< 1.1	< 0.012	< 0.004	< 0.0046	< 0.0427	< 0.0046	< 0.006	< 0.004
Bromobenzene	< 0.013	< 0.0098	< 0.15	< 1.1	< 0.012	< 0.004	< 0.0046	< 0.0427	< 0.0046	< 0.006	< 0.004
Bromochloromethane	< 0.013	< 0.0098	< 0.15	< 1.1	< 0.012	< 0.004	< 0.0046	< 0.0427	< 0.0046	< 0.006	< 0.004
Bromodichloromethane	< 0.013	< 0.0098	< 0.15	< 1.1	< 0.012	< 0.004	< 0.0046	< 0.0427	< 0.0046	< 0.006	< 0.004
Bromoform	< 0.013	< 0.0098	< 0.15	< 1.1	< 0.012	< 0.004	< 0.0046	< 0.0427	< 0.0046	< 0.006	< 0.004
Bromomethane	< 0.026	< 0.02	< 0.3	< 2.3	< 0.024	< 0.0081	< 0.0093	< 0.0855	< 0.0091	< 0.0121	< 0.0079
Carbon Disulfide	< 0.013	< 0.0098	< 0.15	< 1.1	< 0.012	< 0.004	< 0.0046	< 0.0427	< 0.0046	< 0.006	< 0.004
Carbon tetrachloride	< 0.013	< 0.0098	< 0.15	< 1.1	< 0.012	< 0.004	< 0.0046	< 0.0427	< 0.0046	< 0.006	< 0.004
Chlorobenzene	< 0.013	< 0.0098	< 0.15	< 1.1	< 0.012	< 0.004	< 0.0046	< 0.0427	< 0.0046	< 0.006	< 0.004
Chloroethane	< 0.026	< 0.02	< 0.3	< 2.3	< 0.024	< 0.0081	< 0.0093	< 0.0855	< 0.0091	< 0.0121	< 0.0079
Chloroform	< 0.013	< 0.0098	< 0.15	< 1.1	< 0.012	< 0.004	< 0.0046	< 0.0427	< 0.0046	< 0.006	< 0.004

Table A2
Sediment Data (0-7 ft)
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Former Gorham Manufacturing Site
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Providence, Rhode Island

chemical.name	SD-1001 SD-1001 12/28/2005 0-2	SD-1002 SD-1002 12/28/2005 0-2	SD-1003 SD-1003 12/28/2005 0-2	SD-1004 SD-1004 12/28/2005 0-2	SD-1005 SD-1005 12/28/2005 0-2	SED10 SED1001 6/22/2006 0.5-1	SED10 SED1003 6/22/2006 2.5-3	SED11 SED1101 6/22/2006 0-1	SED11 SED1103 6/22/2006 2.5-3	SED12 SED1201 6/22/2006 0.5-1	SED12 SED1203 6/22/2006 2.5-3
Chloromethane	< 0.026	< 0.02	< 0.3	< 2.3	< 0.024	< 0.0081	< 0.0093	< 0.0855	< 0.0091	< 0.0121	< 0.0079
cis-1,2-Dichloroethene	< 0.013	< 0.0098	0.42	< 1.1	0.016	< 0.004	< 0.0046	< 0.0427	< 0.0046	< 0.006	< 0.004
cis-1,3-Dichloropropene	< 0.013	< 0.0098	< 0.15	< 1.1	< 0.012	< 0.004	< 0.0046	< 0.0427	< 0.0046	< 0.006	< 0.004
Dibromochloromethane	< 0.013	< 0.0098	< 0.15	< 1.1	< 0.012	< 0.004	< 0.0046	< 0.0427	< 0.0046	< 0.006	< 0.004
Dibromomethane	< 0.013	< 0.0098	< 0.15	< 1.1	< 0.012	< 0.004	< 0.0046	< 0.0427	< 0.0046	< 0.006	< 0.004
Dichlorodifluoromethane	< 0.026	< 0.02	< 0.3	< 2.3	< 0.024	< 0.0081	< 0.0093	< 0.0855	< 0.0091	< 0.0121	< 0.0079
Diethyl ether						< 0.004	< 0.0046	< 0.0427	< 0.0046	< 0.006	< 0.004
Diisopropyl ether						< 0.004	< 0.0046	< 0.0427	< 0.0046	< 0.006	< 0.004
Ethyl tertiary-butyl ether						< 0.004	< 0.0046	< 0.0427	< 0.0046	< 0.006	< 0.004
Ethylbenzene	< 0.013	< 0.0098	< 0.15	< 1.1	< 0.012	< 0.004	< 0.0046	< 0.0427	< 0.0046	< 0.006	< 0.004
Hexachlorobutadiene	< 0.013	< 0.0098	< 0.15		< 0.012	< 0.004	< 0.0046	< 0.0427	< 0.0046	< 0.006	< 0.004
Isopropyl Benzene	< 0.013	< 0.0098	< 0.15	< 1.1	< 0.012	< 0.004	< 0.0046	< 0.0427	< 0.0046	< 0.006	< 0.004
m,p-Xylene	< 0.013	< 0.0098	< 0.15	< 1.1	< 0.012	< 0.0081	< 0.0093	< 0.0855	< 0.0091	< 0.0121	< 0.0079
Methylene Chloride	< 0.013	< 0.0098	< 0.15	< 1.1	< 0.012	< 0.0201	< 0.0231	< 0.214	< 0.0228	< 0.0302	< 0.0198
Methyl-t-butyl ether	< 0.013	< 0.0098	< 0.15	< 1.1	< 0.012	< 0.004	< 0.0046	< 0.0427	< 0.0046	< 0.006	< 0.004
Naphthalene						< 0.004	< 0.0046	< 0.0427	< 0.0046	< 0.006	< 0.004
n-Butylbenzene	< 0.013	< 0.0098	< 0.15	< 1.1	< 0.012	< 0.004	< 0.0046	< 0.0427	< 0.0046	< 0.006	< 0.004
n-Propyl Benzene	< 0.013	< 0.0098	< 0.15	< 1.1	< 0.012	< 0.004	< 0.0046	< 0.0427	< 0.0046	< 0.006	< 0.004
o-Xylene	< 0.013	< 0.0098	< 0.15	< 1.1	< 0.012	< 0.004	< 0.0046	< 0.0427	< 0.0046	< 0.006	< 0.004
p-Isopropyl Toluene	< 0.013	< 0.0098	< 0.15	< 1.1	< 0.012	< 0.004	< 0.0046	< 0.0427	< 0.0046	< 0.006	< 0.004
s-Butylbenzene	< 0.013	< 0.0098	< 0.15	< 1.1	< 0.012	< 0.004	< 0.0046	< 0.0427	< 0.0046	< 0.006	< 0.004
Styrene	< 0.013	< 0.0098	< 0.15	< 1.1	< 0.012	< 0.004	< 0.0046	< 0.0427	< 0.0046	< 0.006	< 0.004
t-Butylbenzene	< 0.013	< 0.0098	< 0.15	< 1.1	< 0.012	< 0.004	< 0.0046	< 0.0427	< 0.0046	< 0.006	< 0.004
Tertiary-amyl methyl ether						< 0.004	< 0.0046	< 0.0427	< 0.0046	< 0.006	< 0.004
Tetrachloroethene	< 0.013	< 0.0098	< 0.15	< 1.1	< 0.012	< 0.004	< 0.0046	< 0.0427	< 0.0046	< 0.006	< 0.004
Tetrahydrofuran						< 0.004	< 0.0046	< 0.0427	< 0.0046	< 0.006	< 0.004
Toluene	< 0.013	< 0.0098	< 0.15	< 1.1	< 0.012	< 0.004	< 0.0046	< 0.0427	< 0.0046	< 0.006	< 0.004
trans-1,2-Dichloroethene	< 0.013	< 0.0098	< 0.15	< 1.1	< 0.012	< 0.004	< 0.0046	< 0.0427	< 0.0046	< 0.006	< 0.004
trans-1,3-Dichloropropene	< 0.013	< 0.0098	< 0.15	< 1.1	< 0.012	< 0.004	< 0.0046	< 0.0427	< 0.0046	< 0.006	< 0.004
Trichloroethene	< 0.013	< 0.0098	< 0.15	5.6	0.21	< 0.004	< 0.0046	< 0.0427	< 0.0046	< 0.006	< 0.004
Trichlorofluoromethane	< 0.026	< 0.02	< 0.3	< 2.3	< 0.024	< 0.004	< 0.0046	< 0.0427	< 0.0046	< 0.006	< 0.004
Vinyl acetate											
Vinyl Chloride	< 0.026	< 0.02	5	< 2.3	< 0.024	< 0.0081	< 0.0093	< 0.0855	< 0.0091	< 0.0121	< 0.0079
Xylenes, Total						< 0.0121	< 0.0139	< 0.128	< 0.0137	< 0.0181	< 0.0119
Semivolatile Organics (mg/kg)											
1,2,4-Trichlorobenzene				< 0.74							
1,2-Dichlorobenzene				< 0.74							
1,3-Dichlorobenzene				< 0.74							
1,4-Dichlorobenzene				< 0.74							
1-Methylnaphthalene						< 0.0305	< 0.0344	< 0.163	< 0.0317	< 0.0553	< 0.0324
2,4,5-Trichlorophenol	< 0.44	< 0.33	< 0.99	< 0.74	< 0.2						
2,4,6-Trichlorophenol	< 0.44	< 0.33	< 0.99	< 0.74	< 0.2						

Table A2
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chemical.name	SD-1001 SD-1001 12/28/2005 0-2	SD-1002 SD-1002 12/28/2005 0-2	SD-1003 SD-1003 12/28/2005 0-2	SD-1004 SD-1004 12/28/2005 0-2	SD-1005 SD-1005 12/28/2005 0-2	SED10 SED1001 6/22/2006 0.5-1	SED10 SED1003 6/22/2006 2.5-3	SED11 SED1101 6/22/2006 0-1	SED11 SED1103 6/22/2006 2.5-3	SED12 SED1201 6/22/2006 0.5-1	SED12 SED1203 6/22/2006 2.5-3
2,4-Dichlorophenol	< 0.44	< 0.33	< 0.99	< 0.74	< 0.2						
2,4-Dimethylphenol	< 0.44	< 0.33	< 0.99	< 0.74	< 0.2						
2,4-Dinitrophenol	< 0.44	< 0.33	< 0.99	< 0.74	< 0.2						
2,4-Dinitrotoluene	< 0.44	< 0.33	< 0.99	< 0.74	< 0.2						
2,6-Dinitrotoluene	< 0.44	< 0.33	< 0.99	< 0.74	< 0.2						
2-Chloronaphthalene	< 0.44	< 0.33	< 0.99	< 0.74	< 0.2						
2-Chlorophenol	< 0.44	< 0.33	< 0.99	< 0.74	< 0.2						
2-Methylnaphthalene	< 0.44	< 0.33	< 0.99	< 0.74	< 0.2	< 0.0305	< 0.0344	< 0.163	< 0.0317	< 0.0553	< 0.0324
2-Methylphenol (o-Cresol)	< 0.44	< 0.33	< 0.99	< 0.74	< 0.2						
2-Nitroaniline	< 0.88	< 0.66	< 2	< 1.5	< 0.39						
2-Nitrophenol	< 0.44	< 0.33	< 0.99	< 0.74	< 0.2						
3&4-Methylphenol	< 0.44	< 0.33	< 0.99	< 0.74	< 0.2						
3,3'-Dichlorobenzidine	< 0.44	< 0.33	< 0.99	< 0.74	< 0.2						
3-Nitroaniline	< 0.88	< 0.66	< 2	< 1.5	< 0.39						
4,6-Dinitro-2-methylphenol	< 0.44	< 0.33	< 0.99	< 0.74	< 0.2						
4-Bromophenyl-phenylether	< 0.44	< 0.33	< 0.99	< 0.74	< 0.2						
4-Chloro-3-methylphenol	< 0.44	< 0.33	< 0.99	< 0.74	< 0.2						
4-Chloroaniline	< 0.88	< 0.66	< 2	< 1.5	< 0.39						
4-Chlorophenyl-phenylether	< 0.44	< 0.33	< 0.99	< 0.74	< 0.2						
4-Nitroaniline	< 0.88	< 0.66	< 2	< 1.5	< 0.39						
4-Nitrophenol	< 0.44	< 0.33	< 0.99	< 0.74	< 0.2						
Acenaphthene	0.25	0.26	< 0.039	< 0.03	0.024	< 0.0305	< 0.0344	< 0.163	< 0.0317	0.0564	< 0.0324
Acenaphthylene	0.07	0.026	< 0.039	< 0.03	< 0.0079	< 0.0305	< 0.0344	< 0.163	< 0.0317	< 0.0553	< 0.0324
Aniline	< 0.88	< 0.66	< 2	< 1.5	< 0.39						
Anthracene	0.83	0.36	0.11	0.04	0.079	< 0.0305	< 0.0344	< 0.163	< 0.0317	0.276	< 0.0324
Azobenzene	< 0.44	< 0.33	< 0.99	< 0.74	< 0.2						
Benzo(a)anthracene	2	0.69	0.29	0.16	0.15	< 0.0305	< 0.0344	< 0.163	< 0.0317	0.685	< 0.0324
Benzo(a)pyrene	1.8	0.59	0.24	0.15	0.12	< 0.0305	< 0.0344	< 0.163	< 0.0317	0.862	< 0.0324
Benzo(b)fluoranthene	2.9	0.86	0.34	0.25	0.17	< 0.0305	< 0.0344	0.245	< 0.0317	1.41	< 0.0324
Benzo(g,h,i)perylene	0.73	0.26	0.11	0.088	0.046	< 0.0305	< 0.0344	< 0.163	< 0.0317	0.244	< 0.0324
Benzo(k)fluoranthene	0.97	0.25	0.18	0.11	0.065	< 0.0305	< 0.0344	< 0.163	< 0.0317	0.636	< 0.0324
Benzoic acid	< 2.2	< 1.6	< 4.9	< 3.7	< 0.98						
Benzyl alcohol	< 0.88	< 0.66	< 2	< 1.5	< 0.39						
Bis(2-chloroethoxy)methane	< 0.44	< 0.33	< 0.99	< 0.74	< 0.2						
Bis(2-chloroethyl)ether	< 0.44	< 0.33	< 0.99	< 0.74	< 0.2						
Bis(2-chloroisopropyl)ether	< 0.88	< 0.66	< 2	< 1.5	< 0.39						
bis(2-Ethylhexyl)phthalate	< 0.44	< 0.33	< 0.99	< 0.74	< 0.2						
Butylbenzylphthalate	< 0.44	< 0.33	< 0.99	< 0.74	< 0.2						
Chrysene	2.4	0.84	0.43	0.24	0.16	< 0.0305	< 0.0344	< 0.163	< 0.0317	0.625	< 0.0324
Dibenzo(a,h)anthracene	0.22	< 0.013	< 0.039	< 0.03	< 0.0079	< 0.0305	< 0.0344	< 0.163	< 0.0317	0.0807	< 0.0324
Dibenzofuran	< 0.88	< 0.66	< 2	< 1.5	< 0.39						
Diethylphthalate	< 0.44	< 0.33	< 0.99	< 0.74	< 0.2						

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chemical.name	SD-1001 SD-1001 12/28/2005 0-2	SD-1002 SD-1002 12/28/2005 0-2	SD-1003 SD-1003 12/28/2005 0-2	SD-1004 SD-1004 12/28/2005 0-2	SD-1005 SD-1005 12/28/2005 0-2	SED10 SED1001 6/22/2006 0.5-1	SED10 SED1003 6/22/2006 2.5-3	SED11 SED1101 6/22/2006 0-1	SED11 SED1103 6/22/2006 2.5-3	SED12 SED1201 6/22/2006 0.5-1	SED12 SED1203 6/22/2006 2.5-3
Dimethylphthalate	< 0.44	< 0.33	< 0.99	< 0.74	< 0.2						
Di-n-butylphthalate	0.48	< 0.33	1.1	< 0.74	< 0.2						
Di-n-octylphthalate	< 0.44	< 0.33	< 0.99	< 0.74	< 0.2						
Fluoranthene	4.3	1.6	0.71	0.45	0.39	< 0.0305	< 0.0344	0.327	< 0.0317	1.92	< 0.0324
Fluorene	< 0.018	0.022	0.081	0.036	0.025	< 0.0305	< 0.0344	< 0.163	< 0.0317	0.107	< 0.0324
Hexachlorobenzene	< 0.44	< 0.33	< 0.99	< 0.74	< 0.2						
Hexachlorobutadiene				< 0.74							
Hexachlorocyclopentadiene	< 0.44	< 0.33	< 0.99	< 0.74	< 0.2						
Hexachloroethane	< 0.44	< 0.33	< 0.99	< 0.74	< 0.2						
Indeno(1,2,3-cd)pyrene	0.74	0.22	0.11	< 0.03	0.046	< 0.0305	< 0.0344	< 0.163	< 0.0317	0.259	< 0.0324
Isophorone	< 0.44	< 0.33	< 0.99	< 0.74	< 0.2						
Naphthalene	0.21	0.28	< 0.039	< 0.03	0.045	< 0.0305	< 0.0344	< 0.163	< 0.0317	< 0.0553	< 0.0324
Nitrobenzene	< 0.44	< 0.33	< 0.99	< 0.74	< 0.2						
N-Nitrosodimethylamine	< 0.44	< 0.33	< 0.99	< 0.74	< 0.2						
N-Nitroso-di-n-propylamine	< 0.44	< 0.33	< 0.99	< 0.74	< 0.2						
N-Nitrosodiphenylamine	< 0.44	< 0.33	< 0.99	< 0.74	< 0.2						
Pentachlorophenol	< 0.88	< 0.66	< 2	< 1.5	< 0.39						
Phenanthrene	4	2.1	0.48	0.23	0.41	< 0.0305	< 0.0344	< 0.163	< 0.0317	1.14	< 0.0324
Phenol	< 0.44	< 0.33	< 0.99	< 0.74	< 0.2						
Pyrene	5.3	2.3	0.76	0.45	0.4	< 0.0305	< 0.0344	0.258	< 0.0317	1.01	< 0.0324
Pesticides/PCBs (mg/kg)											
4,4'-DDD	< 0.0017	< 0.0013	< 0.004	< 0.003	< 0.00081	< 0.0056		< 0.0351		0.0214	
4,4'-DDE	< 0.0017	< 0.0013	< 0.004	< 0.003	< 0.00081	< 0.0056		< 0.0351		< 0.0112	
4,4'-DDT	< 0.0017	< 0.0013	< 0.004	< 0.003	< 0.00081	< 0.0056		< 0.0351		< 0.0112	
Aldrin	< 0.0017	< 0.0013	< 0.004	< 0.003	< 0.00081	< 0.0056		< 0.0351		< 0.0112	
alpha-BHC	< 0.0017	< 0.0013	< 0.004	< 0.003	< 0.00081	< 0.0056		< 0.0351		< 0.0112	
alpha-Chlordane	< 0.0017	< 0.0013	< 0.004	< 0.003	< 0.00081	< 0.0056		< 0.0351		< 0.0112	
Aroclor-1016	< 0.034	< 0.066	< 0.04	< 0.03	< 0.016	< 0.056		< 0.351		< 0.112	
Aroclor-1221	< 0.034	< 0.066	< 0.04	< 0.03	< 0.016	< 0.056		< 0.351		< 0.112	
Aroclor-1232	< 0.034	< 0.066	< 0.04	< 0.03	< 0.016	< 0.056		< 0.351		< 0.112	
Aroclor-1242	< 0.034	< 0.066	< 0.04	< 0.03	< 0.016	< 0.056		< 0.351		< 0.112	
Aroclor-1248	< 0.034	< 0.066	< 0.04	< 0.03	< 0.016	< 0.056		< 0.351		< 0.112	
Aroclor-1254	< 0.034	< 0.066	< 0.04	< 0.03	< 0.016	< 0.056		< 0.351		< 0.112	
Aroclor-1260	< 0.034	< 0.066	< 0.04	< 0.03	< 0.016	< 0.056		< 0.351		< 0.112	
Aroclor-1262						< 0.056		< 0.351		< 0.112	
Aroclor-1268						< 0.056		< 0.351		< 0.112	
beta-BHC	< 0.0017	< 0.0013	< 0.004	< 0.003	< 0.00081	< 0.0056		< 0.0351		< 0.0112	
Chlordane						< 0.056		< 0.351		< 0.112	
delta-BHC	< 0.0017	< 0.0013	< 0.004	< 0.003	< 0.00081	< 0.0056		< 0.0351		< 0.0112	
Dieldrin	< 0.0017	< 0.0013	< 0.004	< 0.003	< 0.00081	< 0.0056		< 0.0351		< 0.0112	
Endosulfan I	< 0.0017	< 0.0013	< 0.004	< 0.003	< 0.00081	< 0.0056		< 0.0351		< 0.0112	
Endosulfan II	< 0.0017	< 0.0013	< 0.004	< 0.003	< 0.00081	< 0.0056		< 0.0351		< 0.0112	

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chemical.name	SD-1001 SD-1001 12/28/2005 0-2	SD-1002 SD-1002 12/28/2005 0-2	SD-1003 SD-1003 12/28/2005 0-2	SD-1004 SD-1004 12/28/2005 0-2	SD-1005 SD-1005 12/28/2005 0-2	SED10 SED1001 6/22/2006 0.5-1	SED10 SED1003 6/22/2006 2.5-3	SED11 SED1101 6/22/2006 0-1	SED11 SED1103 6/22/2006 2.5-3	SED12 SED1201 6/22/2006 0.5-1	SED12 SED1203 6/22/2006 2.5-3
Endosulfan sulfate	< 0.0017	< 0.0013	< 0.004	< 0.003	< 0.00081	< 0.0056		< 0.0351		< 0.0112	
Endrin	< 0.0017	< 0.0013	< 0.004	< 0.003	< 0.00081	< 0.0056		< 0.0351		< 0.0112	
Endrin aldehyde	< 0.0017	< 0.0013	< 0.004	< 0.003	< 0.00081	< 0.0056		< 0.0351		< 0.0112	
Endrin ketone	< 0.0017	< 0.0013	< 0.004	< 0.003	< 0.00081	< 0.0056		< 0.0351		< 0.0112	
gamma-BHC (Lindane)	< 0.0017	< 0.0013	< 0.004	< 0.003	< 0.00081	< 0.0056		< 0.0351		< 0.0112	
gamma-Chlordane	< 0.0017	< 0.0013	< 0.004	< 0.003	< 0.00081	< 0.0056		< 0.0351		< 0.0112	
Heptachlor	< 0.0017	< 0.0013	< 0.004	< 0.003	< 0.00081	< 0.0056		< 0.0351		< 0.0112	
Heptachlor epoxide	< 0.0017	< 0.0013	< 0.004	< 0.003	< 0.00081	< 0.0056		< 0.0351		< 0.0112	
Hexachlorobenzene						< 0.0056		< 0.0351		< 0.0112	
Methoxychlor	< 0.0017	< 0.0013	< 0.004	< 0.003	< 0.00081	< 0.0056		< 0.0351		< 0.0112	
Toxaphene	< 0.086	< 0.066	< 0.2	< 0.15	< 0.04	< 0.28		< 1.75		< 0.558	
Antimony	2.7	1.6	< 2.7	< 2	< 0.54	< 6.5	< 7.4	< 25.7	< 6.8	< 11.9	< 7.2
Arsenic	19	12	45	32	3.8	< 0.3	1.1	4.8	7.1	< 3	< 1.8
Barium	190	76	250	69	19	10.2	19.9	156	7.1	33.1	14.5
Beryllium	1.1	0.46	1.4	3.5	0.075	< 0.07	< 0.07	0.47	< 0.07	0.31	< 0.07
Cadmium	1.8	0.91	4.1	3.2	0.14	< 0.65	< 0.74	3.24	< 0.68	< 1.19	< 0.72
Chromium	71	12	100	59	4.8	3	5	213	3.1	7	5
Copper	1200	180	740	1500	19	4.1	4	423	1.7	12.5	5.1
Lead	340	140	590	140	23	< 6.5	< 7.4	590	< 6.8	20.7	< 7.2
Mercury	0.3	0.087	1.3	0.2	0.031	< 0.035	< 0.044	< 0.208	< 0.037	< 0.068	< 0.042
Nickel	48	20	120	810	10	3.6	4	85.7	< 3.4	< 5.9	5.7
Selenium	3.2	1.8	< 2.7	< 2	< 0.54	< 6.5	< 7.4	< 25.7	< 6.8	< 11.9	< 7.2
Silver	120	15	95	24	2.9	< 0.65	< 0.74	29.7	< 0.68	< 1.19	< 0.72
Thallium	< 0.58	< 0.44	< 1.4	< 1	< 0.27	< 1.6	< 1.9	< 6.4	< 1.7	< 3	< 1.8
Zinc	570	200	770	1200	34	28.1	12.4	620	5.3	34.7	61.2
Total Cyanide	< 1.3	< 0.98	< 3	< 2.3	< 0.6						
Total Organic Carbon (TOC)						780		65000		2300	
TPH (mg/kg)											
Total Petroleum Hydrocarbons (TPH)	1900	2600	1700	740	370	< 42.6		< 253		< 85	
Dioxins/Furans (mg/kg)											
1,2,3,4,6,7,8-HpCDD	0.00011	0.000059	0.00013	0.00014	0.000017	< 0.00000075		0.00028		0.0000074	
1,2,3,4,6,7,8-HpCDF	0.000092	0.00016	0.00027	0.00021	0.00003	< 0.00000075		0.00014		0.000002	
1,2,3,4,7,8,9-HpCDF	0.0000099	0.000014	0.000049	0.000047	0.0000041	< 0.00000075		0.000018		< 0.00000071	
1,2,3,4,7,8-HxCDD	0.0000049	0.0000061	0.000016	< 0.000014	< 0.0000018	< 0.00000075		0.0000095		< 0.00000071	
1,2,3,4,7,8-HxCDF	0.00003	0.000057	0.00017	0.00011	0.000017	< 0.00000075		0.000036		< 0.00000071	
1,2,3,6,7,8-HxCDD	0.000013	0.000012	0.000042	0.000039	0.0000047	< 0.00000075		0.000025		< 0.00000071	
1,2,3,6,7,8-HxCDF	0.000037	0.000059	0.00023	0.00026	0.000033	< 0.00000075		0.000086		< 0.00000071	
1,2,3,7,8,9-HxCDD	0.0000082	0.000008	0.000021	0.00002	< 0.0000027	< 0.00000075		0.000017		< 0.00000071	
1,2,3,7,8,9-HxCDF	< 0.0000031	< 0.0000028	0.0000086	< 0.0000071	< 0.00000091	< 0.00000075		0.00003		< 0.00000071	
1,2,3,7,8-PeCDD	0.0000097	0.0000074	0.000031	0.000033	< 0.000003	< 0.00000075		0.000011		< 0.00000071	
1,2,3,7,8-PeCDF	0.000016	0.000028	0.00006	0.000055	0.0000083	< 0.00000075		0.000032		< 0.00000071	
2,3,4,6,7,8-HxCDF	0.000036	0.000051	0.00018	0.00022	0.000028	< 0.00000075		0.00008		< 0.00000071	

Table A2
Sediment Data (0-7 ft)
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chemical.name	SD-1001 SD-1001 12/28/2005 0-2	SD-1002 SD-1002 12/28/2005 0-2	SD-1003 SD-1003 12/28/2005 0-2	SD-1004 SD-1004 12/28/2005 0-2	SD-1005 SD-1005 12/28/2005 0-2	SED10 SED1001 6/22/2006 0.5-1	SED10 SED1003 6/22/2006 2.5-3	SED11 SED1101 6/22/2006 0-1	SED11 SED1103 6/22/2006 2.5-3	SED12 SED1201 6/22/2006 0.5-1	SED12 SED1203 6/22/2006 2.5-3
2,3,4,7,8-PeCDF	0.000036	0.000043	0.00016	0.00017	0.000023	< 0.00000075		0.00043		0.00000073	
2,3,7,8-TCDD	0.0000053	0.0000025	0.0000095	0.0000092	0.00000098	< 0.00000015		0.0000042		< 0.00000014	
2,3,7,8-TCDF	0.000018	0.000015	0.000027	0.000029	0.0000043	< 0.00000015		< 0.0000005		0.00000024	
OCDD	0.00075	0.00024	0.00042	0.00048	0.000077	0.0000044		0.0018		0.000064	
OCDF	0.000075	0.00019	0.00019	0.00007	0.0000076	< 0.0000015		0.000087		0.0000031	
TOTAL HpCDD	0.0002	0.00012	0.00027	0.00026	0.000036	< 0.00000075		0.00063		0.000013	
TOTAL HpCDF	0.00018	0.00024	0.00062	0.00055	0.000073	< 0.00000075		0.00033		0.000002	
TOTAL HxCDD	0.00012	0.00013	0.00049	0.00042	0.000048	< 0.00000075		0.0003		0.0000011	
TOTAL HxCDF	0.00078	0.001	0.0055	0.0058	0.00079	< 0.00000075		0.0023		0.0000039	
TOTAL PeCDD	0.000074	0.000056	0.00031	0.00029	0.000022	< 0.00000075		0.00014		< 0.00000071	
TOTAL PeCDF	0.00068	0.00088	0.0051	0.0054	0.00075	< 0.00000075		0.0055		0.0000056	
TOTAL TCDD	0.000077	0.000045	0.00012	0.00011	0.000011	< 0.00000015		0.000089		0.00000031	
TOTAL TCDF	0.00029	0.00029	0.0013	0.0013	0.00017	< 0.00000015		0.0016		0.0000037	

< - Compound not detected.
Value is detection limit.
mg/kg - milligrams per kilogram

Table A2
Sediment Data (0-7 ft)
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Providence, Rhode Island

chemical.name	SED13 SED1301 6/22/2006 0-0.5	SED13 SED1303 6/22/2006 2-2.5	SED14 SED1401 6/22/2006 0-1	SED14 SED1403 6/22/2006 2.5-3	SED15 SED1501 6/22/2006 0-1	SED15 SED1503 6/22/2006 2-3	SED16 SED1601 6/22/2006 0-1	SED16 SED1603 6/22/2006 2.5-3	SED17 SED1701 6/22/2006 0.5-1	SED17 SED1704 6/22/2006 3-3.8	SED18 SED1801 6/22/2006 0-1
Volatile Organics (mg/kg)											
1,1,1,2-Tetrachloroethane	< 0.0045	< 0.005	< 0.012	< 0.0051	< 0.0046	< 0.0037	< 0.0235	< 0.0045	< 0.0046	< 0.0045	< 0.0506
1,1,1-Trichloroethane	< 0.0045	< 0.005	< 0.012	< 0.0051	0.863	0.234	< 0.0235	< 0.0045	0.732	0.555	< 0.0506
1,1,2,2-Tetrachloroethane	< 0.0045	< 0.005	< 0.012	< 0.0051	< 0.0046	< 0.0037	< 0.0235	< 0.0045	< 0.0046	< 0.0045	< 0.0506
1,1,2-Trichloroethane	< 0.0045	< 0.005	< 0.012	< 0.0051	< 0.0046	< 0.0037	< 0.0235	< 0.0045	< 0.0046	< 0.0045	< 0.0506
1,1-Dichloroethane	< 0.0045	< 0.005	< 0.012	< 0.0051	0.0518	0.0061	< 0.0235	< 0.0045	0.137	0.031	< 0.0506
1,1-Dichloroethene	< 0.0045	< 0.005	< 0.012	< 0.0051	0.0467	0.0174	< 0.0235	< 0.0045	0.0555	0.0358	< 0.0506
1,1-Dichloropropene	< 0.0045	< 0.005	< 0.012	< 0.0051	< 0.0046	< 0.0037	< 0.0235	< 0.0045	< 0.0046	< 0.0045	< 0.0506
1,2,3-Trichlorobenzene	< 0.0045	< 0.005	< 0.012	< 0.0051	< 0.0046	< 0.0037	< 0.0235	< 0.0045	< 0.0046	< 0.0045	< 0.0506
1,2,3-Trichloropropane	< 0.0045	< 0.005	< 0.012	< 0.0051	< 0.0046	< 0.0037	< 0.0235	< 0.0045	< 0.0046	< 0.0045	< 0.0506
1,2,4-Trichlorobenzene	< 0.0045	< 0.005	< 0.012	< 0.0051	< 0.0046	< 0.0037	< 0.0235	< 0.0045	< 0.0046	< 0.0045	< 0.0506
1,2,4-Trimethylbenzene	< 0.0045	< 0.005	< 0.012	< 0.0051	< 0.0046	< 0.0037	< 0.0235	< 0.0045	< 0.0046	< 0.0045	< 0.0506
1,2-Dibromo-3-Chloropropane	< 0.0045	< 0.005	< 0.012	< 0.0051	< 0.0046	< 0.0037	< 0.0235	< 0.0045	< 0.0046	< 0.0045	< 0.0506
1,2-Dibromoethane	< 0.0045	< 0.005	< 0.012	< 0.0051	< 0.0046	< 0.0037	< 0.0235	< 0.0045	< 0.0046	< 0.0045	< 0.0506
1,2-Dichlorobenzene	< 0.0045	< 0.005	< 0.012	< 0.0051	< 0.0046	< 0.0037	< 0.0235	< 0.0045	< 0.0046	< 0.0045	< 0.0506
1,2-Dichloroethane	< 0.0045	< 0.005	< 0.012	< 0.0051	< 0.0046	< 0.0037	< 0.0235	< 0.0045	< 0.0046	< 0.0045	< 0.0506
1,2-Dichloropropane	< 0.0045	< 0.005	< 0.012	< 0.0051	< 0.0046	< 0.0037	< 0.0235	< 0.0045	< 0.0046	< 0.0045	< 0.0506
1,3,5-Trimethylbenzene	< 0.0045	< 0.005	< 0.012	< 0.0051	< 0.0046	< 0.0037	< 0.0235	< 0.0045	< 0.0046	< 0.0045	< 0.0506
1,3-Dichlorobenzene	< 0.0045	< 0.005	< 0.012	< 0.0051	< 0.0046	< 0.0037	< 0.0235	< 0.0045	< 0.0046	< 0.0045	< 0.0506
1,3-Dichloropropane	< 0.0045	< 0.005	< 0.012	< 0.0051	< 0.0046	< 0.0037	< 0.0235	< 0.0045	< 0.0046	< 0.0045	< 0.0506
1,4-Dichlorobenzene	< 0.0045	< 0.005	< 0.012	< 0.0051	< 0.0046	< 0.0037	< 0.0235	< 0.0045	< 0.0046	< 0.0045	< 0.0506
1,4-Dioxane	< 0.223	< 0.252	< 0.601	< 0.255	< 0.23	< 0.185	< 1.17	< 0.226	< 0.232	< 0.227	< 2.53
1-Chlorohexane	< 0.0045	< 0.005	< 0.012	< 0.0051	< 0.0046	< 0.0037	< 0.0235	< 0.0045	< 0.0046	< 0.0045	< 0.0506
2,2-Dichloropropane	< 0.0045	< 0.005	< 0.012	< 0.0051	< 0.0046	< 0.0037	< 0.0235	< 0.0045	< 0.0046	< 0.0045	< 0.0506
2-Butanone	< 0.0446	< 0.0504	< 0.12	< 0.051	< 0.0461	< 0.037	< 0.235	< 0.0453	< 0.0463	< 0.0454	< 0.506
2-Chlorotoluene	< 0.0045	< 0.005	< 0.012	< 0.0051	< 0.0046	< 0.0037	< 0.0235	< 0.0045	< 0.0046	< 0.0045	< 0.0506
2-Hexanone	< 0.0446	< 0.0504	< 0.12	< 0.051	< 0.0461	< 0.037	< 0.235	< 0.0453	< 0.0463	< 0.0454	< 0.506
4-Chlorotoluene	< 0.0045	< 0.005	< 0.012	< 0.0051	< 0.0046	< 0.0037	< 0.0235	< 0.0045	< 0.0046	< 0.0045	< 0.0506
4-Methyl-2-Pentanone	< 0.0446	< 0.0504	< 0.12	< 0.051	< 0.0461	< 0.037	< 0.235	< 0.0453	< 0.0463	< 0.0454	< 0.506
Acetone	0.105	< 0.0504	0.202	0.164	< 0.0461	< 0.037	< 0.235	< 0.0453	< 0.0463	< 0.0454	1.9
Acrylonitrile											
Benzene	< 0.0045	< 0.005	< 0.012	< 0.0051	< 0.0046	< 0.0037	< 0.0235	< 0.0045	< 0.0046	< 0.0045	< 0.0506
Bromobenzene	< 0.0045	< 0.005	< 0.012	< 0.0051	< 0.0046	< 0.0037	< 0.0235	< 0.0045	< 0.0046	< 0.0045	< 0.0506
Bromochloromethane	< 0.0045	< 0.005	< 0.012	< 0.0051	< 0.0046	< 0.0037	< 0.0235	< 0.0045	< 0.0046	< 0.0045	< 0.0506
Bromodichloromethane	< 0.0045	< 0.005	< 0.012	< 0.0051	< 0.0046	< 0.0037	< 0.0235	< 0.0045	< 0.0046	< 0.0045	< 0.0506
Bromoform	< 0.0045	< 0.005	< 0.012	< 0.0051	< 0.0046	< 0.0037	< 0.0235	< 0.0045	< 0.0046	< 0.0045	< 0.0506
Bromomethane	< 0.0089	< 0.0101	< 0.024	< 0.0102	< 0.0092	< 0.0074	< 0.047	< 0.0091	< 0.0093	< 0.0091	< 0.101
Carbon Disulfide	0.0046	< 0.005	< 0.012	< 0.0051	0.021	< 0.0037	< 0.0235	< 0.0045	0.007	< 0.0045	< 0.0506
Carbon tetrachloride	< 0.0045	< 0.005	< 0.012	< 0.0051	< 0.0046	< 0.0037	< 0.0235	< 0.0045	< 0.0046	< 0.0045	< 0.0506
Chlorobenzene	< 0.0045	< 0.005	< 0.012	< 0.0051	< 0.0046	< 0.0037	< 0.0235	< 0.0045	< 0.0046	< 0.0045	< 0.0506
Chloroethane	< 0.0089	< 0.0101	< 0.024	< 0.0102	< 0.0092	< 0.0074	< 0.047	< 0.0091	< 0.0093	< 0.0091	< 0.101
Chloroform	< 0.0045	< 0.005	< 0.012	< 0.0051	< 0.0046	< 0.0037	< 0.0235	< 0.0045	< 0.0046	< 0.0045	< 0.0506

Table A2
Sediment Data (0-7 ft)
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chemical.name	SED13 SED1301 6/22/2006 0-0.5	SED13 SED1303 6/22/2006 2-2.5	SED14 SED1401 6/22/2006 0-1	SED14 SED1403 6/22/2006 2.5-3	SED15 SED1501 6/22/2006 0-1	SED15 SED1503 6/22/2006 2-3	SED16 SED1601 6/22/2006 0-1	SED16 SED1603 6/22/2006 2.5-3	SED17 SED1701 6/22/2006 0.5-1	SED17 SED1704 6/22/2006 3-3.8	SED18 SED1801 6/22/2006 0-1
Chloromethane	< 0.0089	< 0.0101	< 0.024	< 0.0102	< 0.0092	< 0.0074	< 0.047	< 0.0091	< 0.0093	< 0.0091	< 0.101
cis-1,2-Dichloroethene	< 0.0045	< 0.005	< 0.012	< 0.0051	0.296	0.004	< 0.0235	< 0.0045	0.0298	< 0.0045	< 0.0506
cis-1,3-Dichloropropene	< 0.0045	< 0.005	< 0.012	< 0.0051	< 0.0046	< 0.0037	< 0.0235	< 0.0045	< 0.0046	< 0.0045	< 0.0506
Dibromochloromethane	< 0.0045	< 0.005	< 0.012	< 0.0051	< 0.0046	< 0.0037	< 0.0235	< 0.0045	< 0.0046	< 0.0045	< 0.0506
Dibromomethane	< 0.0045	< 0.005	< 0.012	< 0.0051	< 0.0046	< 0.0037	< 0.0235	< 0.0045	< 0.0046	< 0.0045	< 0.0506
Dichlorodifluoromethane	< 0.0089	< 0.0101	< 0.024	< 0.0102	< 0.0092	< 0.0074	< 0.047	< 0.0091	< 0.0093	< 0.0091	< 0.101
Diethyl ether	< 0.0045	< 0.005	< 0.012	< 0.0051	< 0.0046	< 0.0037	< 0.0235	< 0.0045	< 0.0046	< 0.0045	< 0.0506
Diisopropyl ether	< 0.0045	< 0.005	< 0.012	< 0.0051	< 0.0046	< 0.0037	< 0.0235	< 0.0045	< 0.0046	< 0.0045	< 0.0506
Ethyl tertiary-butyl ether	< 0.0045	< 0.005	< 0.012	< 0.0051	< 0.0046	< 0.0037	< 0.0235	< 0.0045	< 0.0046	< 0.0045	< 0.0506
Ethylbenzene	< 0.0045	< 0.005	< 0.012	< 0.0051	< 0.0046	< 0.0037	< 0.0235	< 0.0045	< 0.0046	< 0.0045	< 0.0506
Hexachlorobutadiene	< 0.0045	< 0.005	< 0.012	< 0.0051	< 0.0046	< 0.0037	< 0.0235	< 0.0045	< 0.0046	< 0.0045	< 0.0506
Isopropyl Benzene	< 0.0045	< 0.005	< 0.012	< 0.0051	< 0.0046	< 0.0037	< 0.0235	< 0.0045	< 0.0046	< 0.0045	< 0.0506
m,p-Xylene	< 0.0089	< 0.0101	< 0.024	< 0.0102	< 0.0092	< 0.0074	< 0.047	< 0.0091	< 0.0093	< 0.0091	< 0.101
Methylene Chloride	< 0.0223	< 0.0252	< 0.0601	< 0.0255	< 0.023	< 0.0185	< 0.117	< 0.0226	< 0.0232	< 0.0227	< 0.253
Methyl-t-butyl ether	< 0.0045	< 0.005	< 0.012	< 0.0051	< 0.0046	< 0.0037	< 0.0235	< 0.0045	< 0.0046	< 0.0045	< 0.0506
Naphthalene	< 0.0045	< 0.005	< 0.012	< 0.0051	< 0.0046	< 0.0037	< 0.0235	< 0.0045	< 0.0046	< 0.0045	< 0.0506
n-Butylbenzene	< 0.0045	< 0.005	< 0.012	< 0.0051	< 0.0046	< 0.0037	< 0.0235	< 0.0045	< 0.0046	< 0.0045	< 0.0506
n-Propyl Benzene	< 0.0045	< 0.005	< 0.012	< 0.0051	< 0.0046	< 0.0037	< 0.0235	< 0.0045	< 0.0046	< 0.0045	< 0.0506
o-Xylene	< 0.0045	< 0.005	< 0.012	< 0.0051	< 0.0046	< 0.0037	< 0.0235	< 0.0045	< 0.0046	< 0.0045	< 0.0506
p-Isopropyl Toluene	< 0.0045	< 0.005	< 0.012	< 0.0051	< 0.0046	< 0.0037	< 0.0235	< 0.0045	< 0.0046	< 0.0045	< 0.0506
s-Butylbenzene	< 0.0045	< 0.005	< 0.012	< 0.0051	< 0.0046	< 0.0037	< 0.0235	< 0.0045	< 0.0046	< 0.0045	< 0.0506
Styrene	< 0.0045	< 0.005	< 0.012	< 0.0051	< 0.0046	< 0.0037	< 0.0235	< 0.0045	< 0.0046	< 0.0045	< 0.0506
t-Butylbenzene	< 0.0045	< 0.005	< 0.012	< 0.0051	< 0.0046	< 0.0037	< 0.0235	< 0.0045	< 0.0046	< 0.0045	< 0.0506
Tertiary-amyl methyl ether	< 0.0045	< 0.005	< 0.012	< 0.0051	< 0.0046	< 0.0037	< 0.0235	< 0.0045	< 0.0046	< 0.0045	< 0.0506
Tetrachloroethene	< 0.0045	< 0.005	< 0.012	< 0.0051	0.0161	0.004	< 0.0235	< 0.0045	0.0081	< 0.0045	< 0.0506
Tetrahydrofuran	< 0.0045	< 0.005	< 0.012	< 0.0051	< 0.0046	< 0.0037	< 0.0235	< 0.0045	< 0.0046	< 0.0045	< 0.0506
Toluene	< 0.0045	< 0.005	< 0.012	< 0.0051	< 0.0046	< 0.0037	< 0.0235	< 0.0045	< 0.0046	< 0.0045	< 0.0506
trans-1,2-Dichloroethene	< 0.0045	< 0.005	< 0.012	< 0.0051	0.0053	< 0.0037	< 0.0235	< 0.0045	< 0.0046	< 0.0045	< 0.0506
trans-1,3-Dichloropropene	< 0.0045	< 0.005	< 0.012	< 0.0051	< 0.0046	< 0.0037	< 0.0235	< 0.0045	< 0.0046	< 0.0045	< 0.0506
Trichloroethene	< 0.0045	< 0.005	< 0.012	< 0.0051	1.47	0.224	< 0.0235	< 0.0045	1.22	0.407	< 0.0506
Trichlorofluoromethane	< 0.0045	< 0.005	< 0.012	< 0.0051	< 0.0046	< 0.0037	< 0.0235	< 0.0045	< 0.0046	< 0.0045	< 0.0506
Vinyl acetate					< 0.259	< 0.195			< 0.36	< 0.305	< 4.59
Vinyl Chloride	< 0.0089	< 0.0101	< 0.024	< 0.0102	< 0.0092	< 0.0074	< 0.047	< 0.0091	< 0.0093	< 0.0091	< 0.101
Xylenes, Total	< 0.0134	< 0.0151	< 0.036	< 0.0153	< 0.0138	< 0.0111	< 0.0705	< 0.0136	< 0.0139	< 0.0136	< 0.152
Semivolatile Organics (mg/kg)											
1,2,4-Trichlorobenzene											
1,2-Dichlorobenzene											
1,3-Dichlorobenzene											
1,4-Dichlorobenzene											
1-Methylnaphthalene	< 0.0321	< 0.0311	< 0.0943	< 0.0337	< 0.0315	< 0.0285	< 0.179	< 0.0306	< 0.035	< 0.0306	< 0.183
2,4,5-Trichlorophenol											
2,4,6-Trichlorophenol											

Table A2
Sediment Data (0-7 ft)
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chemical.name	SED13 SED1301 6/22/2006 0-0.5	SED13 SED1303 6/22/2006 2-2.5	SED14 SED1401 6/22/2006 0-1	SED14 SED1403 6/22/2006 2.5-3	SED15 SED1501 6/22/2006 0-1	SED15 SED1503 6/22/2006 2-3	SED16 SED1601 6/22/2006 0-1	SED16 SED1603 6/22/2006 2.5-3	SED17 SED1701 6/22/2006 0.5-1	SED17 SED1704 6/22/2006 3-3.8	SED18 SED1801 6/22/2006 0-1
2,4-Dichlorophenol											
2,4-Dimethylphenol											
2,4-Dinitrophenol											
2,4-Dinitrotoluene											
2,6-Dinitrotoluene											
2-Chloronaphthalene											
2-Chlorophenol											
2-Methylnaphthalene	< 0.0321	< 0.0311	< 0.0943	< 0.0337	< 0.0315	< 0.0285	< 0.179	< 0.0306	< 0.035	< 0.0306	< 0.183
2-Methylphenol (o-Cresol)											
2-Nitroaniline											
2-Nitrophenol											
3&4-Methylphenol											
3,3'-Dichlorobenzidine											
3-Nitroaniline											
4,6-Dinitro-2-methylphenol											
4-Bromophenyl-phenylether											
4-Chloro-3-methylphenol											
4-Chloroaniline											
4-Chlorophenyl-phenylether											
4-Nitroaniline											
4-Nitrophenol											
Acenaphthene	< 0.0321	< 0.0311	< 0.0943	< 0.0337	< 0.0315	< 0.0285	< 0.179	< 0.0306	< 0.035	< 0.0306	< 0.183
Acenaphthylene	< 0.0321	< 0.0311	< 0.0943	< 0.0337	< 0.0315	< 0.0285	< 0.179	< 0.0306	< 0.035	< 0.0306	< 0.183
Aniline											
Anthracene	< 0.0321	< 0.0311	< 0.0943	< 0.0337	< 0.0315	< 0.0285	< 0.179	< 0.0306	< 0.035	< 0.0306	< 0.183
Azobenzene											
Benzo(a)anthracene	< 0.0321	< 0.0311	< 0.0943	< 0.0337	< 0.0315	< 0.0285	< 0.179	< 0.0306	< 0.035	< 0.0306	< 0.183
Benzo(a)pyrene	< 0.0321	< 0.0311	< 0.0943	< 0.0337	< 0.0315	< 0.0285	< 0.179	< 0.0306	< 0.035	< 0.0306	< 0.183
Benzo(b)fluoranthene	0.0378	< 0.0311	< 0.0943	< 0.0337	< 0.0315	< 0.0285	0.201	< 0.0306	< 0.035	< 0.0306	< 0.183
Benzo(g,h,i)perylene	< 0.0321	< 0.0311	< 0.0943	< 0.0337	< 0.0315	< 0.0285	< 0.179	< 0.0306	< 0.035	< 0.0306	< 0.183
Benzo(k)fluoranthene	< 0.0321	< 0.0311	< 0.0943	< 0.0337	< 0.0315	< 0.0285	< 0.179	< 0.0306	< 0.035	< 0.0306	< 0.183
Benzoic acid											
Benzyl alcohol											
Bis(2-chloroethoxy)methane											
Bis(2-chloroethyl)ether											
Bis(2-chloroisopropyl)ether											
bis(2-Ethylhexyl)phthalate											
Butylbenzylphthalate											
Chrysene	< 0.0321	< 0.0311	< 0.0943	< 0.0337	< 0.0315	< 0.0285	< 0.179	< 0.0306	< 0.035	< 0.0306	< 0.183
Dibenzo(a,h)anthracene	< 0.0321	< 0.0311	< 0.0943	< 0.0337	< 0.0315	< 0.0285	< 0.179	< 0.0306	< 0.035	< 0.0306	< 0.183
Dibenzofuran											
Diethylphthalate											

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chemical.name	SED13 SED1301 6/22/2006 0-0.5	SED13 SED1303 6/22/2006 2-2.5	SED14 SED1401 6/22/2006 0-1	SED14 SED1403 6/22/2006 2.5-3	SED15 SED1501 6/22/2006 0-1	SED15 SED1503 6/22/2006 2-3	SED16 SED1601 6/22/2006 0-1	SED16 SED1603 6/22/2006 2.5-3	SED17 SED1701 6/22/2006 0.5-1	SED17 SED1704 6/22/2006 3-3.8	SED18 SED1801 6/22/2006 0-1
Dimethylphthalate											
Di-n-butylphthalate											
Di-n-octylphthalate											
Fluoranthene	0.0833	< 0.0311	0.204	< 0.0337	< 0.0315	< 0.0285	0.33	< 0.0306	< 0.035	< 0.0306	0.267
Fluorene	< 0.0321	< 0.0311	< 0.0943	< 0.0337	< 0.0315	< 0.0285	< 0.179	< 0.0306	< 0.035	< 0.0306	< 0.183
Hexachlorobenzene											
Hexachlorobutadiene											
Hexachlorocyclopentadiene											
Hexachloroethane											
Indeno(1,2,3-cd)pyrene	< 0.0321	< 0.0311	< 0.0943	< 0.0337	< 0.0315	< 0.0285	< 0.179	< 0.0306	< 0.035	< 0.0306	< 0.183
Isophorone											
Naphthalene	< 0.0321	< 0.0311	< 0.0943	< 0.0337	< 0.0315	< 0.0285	< 0.179	< 0.0306	< 0.035	< 0.0306	< 0.183
Nitrobenzene											
N-Nitrosodimethylamine											
N-Nitroso-di-n-propylamine											
N-Nitrosodiphenylamine											
Pentachlorophenol											
Phenanthrene	0.0333	< 0.0311	0.0999	< 0.0337	< 0.0315	< 0.0285	< 0.179	< 0.0306	< 0.035	< 0.0306	< 0.183
Phenol											
Pyrene	0.0513	< 0.0311	0.153	< 0.0337	< 0.0315	< 0.0285	0.244	< 0.0306	< 0.035	< 0.0306	0.187
Pesticides/PCBs (mg/kg)											
4,4'-DDD	< 0.00631		< 0.0192		< 0.00594		< 0.0357		< 0.00671		< 0.0405
4,4'-DDE	< 0.00631		< 0.0192		< 0.00594		< 0.0357		< 0.00671		< 0.0405
4,4'-DDT	< 0.00631		< 0.0192		< 0.00594		< 0.0357		< 0.00671		< 0.0405
Aldrin	< 0.00631		< 0.0192		< 0.00594		< 0.0357		< 0.00671		< 0.0405
alpha-BHC	< 0.00631		< 0.0192		< 0.00594		< 0.0357		< 0.00671		< 0.0405
alpha-Chlordane	< 0.00631		< 0.0192		< 0.00594		< 0.0357		< 0.00671		< 0.0405
Aroclor-1016	< 0.0631		< 0.192		< 0.0593		< 0.357		< 0.067		< 0.404
Aroclor-1221	< 0.0631		< 0.192		< 0.0593		< 0.357		< 0.067		< 0.404
Aroclor-1232	< 0.0631		< 0.192		< 0.0593		< 0.357		< 0.067		< 0.404
Aroclor-1242	< 0.0631		< 0.192		< 0.0593		< 0.357		< 0.067		< 0.404
Aroclor-1248	< 0.0631		< 0.192		< 0.0593		< 0.357		< 0.067		< 0.404
Aroclor-1254	< 0.0631		< 0.192		< 0.0593		< 0.357		< 0.067		< 0.404
Aroclor-1260	< 0.0631		< 0.192		< 0.0593		< 0.357		< 0.067		< 0.404
Aroclor-1262	< 0.0631		< 0.192		< 0.0593		< 0.357		< 0.067		< 0.404
Aroclor-1268	< 0.0631		< 0.192		< 0.0593		< 0.357		< 0.067		< 0.404
beta-BHC	< 0.00631		< 0.0192		< 0.00594		< 0.0357		< 0.00671		< 0.0405
Chlordane	< 0.0631		< 0.192		< 0.0594		< 0.357		< 0.0671		< 0.405
delta-BHC	< 0.00631		< 0.0192		< 0.00594		< 0.0357		< 0.00671		< 0.0405
Dieldrin	< 0.00631		< 0.0192		< 0.00594		< 0.0357		< 0.00671		< 0.0405
Endosulfan I	< 0.00631		< 0.0192		< 0.00594		< 0.0357		< 0.00671		< 0.0405
Endosulfan II	< 0.00631		< 0.0192		< 0.00594		< 0.0357		< 0.00671		< 0.0405

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chemical.name	SED13 SED1301 6/22/2006 0-0.5	SED13 SED1303 6/22/2006 2-2.5	SED14 SED1401 6/22/2006 0-1	SED14 SED1403 6/22/2006 2.5-3	SED15 SED1501 6/22/2006 0-1	SED15 SED1503 6/22/2006 2-3	SED16 SED1601 6/22/2006 0-1	SED16 SED1603 6/22/2006 2.5-3	SED17 SED1701 6/22/2006 0.5-1	SED17 SED1704 6/22/2006 3-3.8	SED18 SED1801 6/22/2006 0-1
Endosulfan sulfate	< 0.00631		< 0.0192		< 0.00594		< 0.0357		< 0.00671		< 0.0405
Endrin	< 0.00631		< 0.0192		< 0.00594		< 0.0357		< 0.00671		< 0.0405
Endrin aldehyde	< 0.00631		< 0.0192		< 0.00594		< 0.0357		< 0.00671		< 0.0405
Endrin ketone	< 0.00631		< 0.0192		< 0.00594		< 0.0357		< 0.00671		< 0.0405
gamma-BHC (Lindane)	< 0.00631		< 0.0192		< 0.00594		< 0.0357		< 0.00671		< 0.0405
gamma-Chlordane	< 0.00631		< 0.0192		< 0.00594		< 0.0357		< 0.00671		< 0.0405
Heptachlor	< 0.00631		< 0.0192		< 0.00594		< 0.0357		< 0.00671		< 0.0405
Heptachlor epoxide	< 0.00631		< 0.0192		< 0.00594		< 0.0357		< 0.00671		< 0.0405
Hexachlorobenzene	< 0.00631		< 0.0192		< 0.00594		< 0.0357		< 0.00671		< 0.0405
Methoxychlor	< 0.00631		< 0.0192		< 0.00594		< 0.0357		< 0.00671		< 0.0405
Toxaphene	< 0.316		< 0.962		< 0.297		< 1.79		< 0.335		< 2.02
Antimony	< 6.7	< 6.9	< 15.1	< 7.8	< 6.6	< 6.3	< 22.6	< 7.1	< 7.6	< 6.3	< 25.7
Arsenic	11.5	5.3	47.6	16.7	12.6	< 1.6	20	6.4	< 0.4	< 0.3	22.2
Barium	11.5	10.5	130	18.5	9.7	9	194	18.6	12.4	11.1	278
Beryllium	< 0.07	0.14	0.35	0.1	< 0.07	< 0.06	0.6	< 0.07	< 0.08	< 0.06	0.72
Cadmium	< 0.67	< 0.69	2.26	< 0.78	< 0.66	< 0.63	5.66	< 0.71	< 0.76	< 0.63	6.9
Chromium	4.7	3.5	49.1	2.1	2.9	2.8	565	3.9	11.1	3.5	640
Copper	5.3	5.3	215	2.1	5.8	4.2	2050	3.7	34.8	3.2	2590
Lead	< 6.7	< 6.9	250	< 7.8	< 6.6	< 6.3	763	< 7.1	20.9	< 6.3	961
Mercury	< 0.04	< 0.037	< 0.116	< 0.045	< 0.041	< 0.037	0.162	< 0.039	< 0.047	< 0.041	0.163
Nickel	22.5	8.9	31.4	< 3.9	6.8	11.3	130	3.5	5.7	5.1	157
Selenium	< 6.7	< 6.9	< 15.1	< 7.8	< 6.6	< 6.3	< 22.6	< 7.1	< 7.6	< 6.3	< 25.7
Silver	< 0.67	< 0.69	18.5	< 0.78	< 0.66	< 0.63	164	< 0.71	5.27	< 0.63	227
Thallium	< 1.7	< 1.7	< 3.8	< 2	< 1.6	< 1.6	< 5.6	< 1.8	< 1.9	< 1.6	< 6.4
Zinc	41.4	20.9	363	6.4	12.6	21.3	1630	10.8	39.3	13.8	1940
Total Cyanide											
Total Organic Carbon (TOC)	2700		31000		7000		73000		5800		115000
TPH (mg/kg)											
Total Petroleum Hydrocarbons (TPH)	< 48.1		< 147		< 44.9		< 275		83.4		< 291
Dioxins/Furans (mg/kg)											
1,2,3,4,6,7,8-HpCDD	0.0000022		0.000071		< 0.0000008		0.00048		0.000021		0.00064
1,2,3,4,6,7,8-HpCDF	< 0.00000076		0.000037		< 0.0000008		0.00057		0.000035		0.001
1,2,3,4,7,8,9-HpCDF	< 0.00000076		0.0000044		< 0.0000008		0.000092		0.0000065		0.00017
1,2,3,4,7,8-HxCDD	< 0.00000076		0.0000033		< 0.0000008		0.000041		0.0000022		0.000074
1,2,3,4,7,8-HxCDF	< 0.00000076		< 0.0000017		< 0.0000008		0.00033		0.000017		0.00067
1,2,3,6,7,8-HxCDD	< 0.00000076		0.0000068		< 0.0000008		0.00012		0.0000057		0.00019
1,2,3,6,7,8-HxCDF	< 0.00000076		0.000026		< 0.0000008		0.00057		0.00003		0.0013
1,2,3,7,8,9-HxCDD	< 0.00000076		0.0000034		< 0.0000008		0.000056		0.0000033		0.000097
1,2,3,7,8,9-HxCDF	< 0.00000076		0.0000084		< 0.0000008		0.00019		0.000013		0.00039
1,2,3,7,8-PeCDD	< 0.00000076		0.0000048		< 0.0000008		0.000056		0.0000033		0.000098
1,2,3,7,8-PeCDF	< 0.00000076		0.0000084		< 0.0000008		< 0.0000034		0.0000081		< 0.0000032
2,3,4,6,7,8-HxCDF	< 0.00000076		0.000051		< 0.0000008		0.0004		0.000075		0.00091

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chemical.name	SED13 SED1301 6/22/2006 0-0.5	SED13 SED1303 6/22/2006 2-2.5	SED14 SED1401 6/22/2006 0-1	SED14 SED1403 6/22/2006 2.5-3	SED15 SED1501 6/22/2006 0-1	SED15 SED1503 6/22/2006 2-3	SED16 SED1601 6/22/2006 0-1	SED16 SED1603 6/22/2006 2.5-3	SED17 SED1701 6/22/2006 0.5-1	SED17 SED1704 6/22/2006 3-3.8	SED18 SED1801 6/22/2006 0-1
2,3,4,7,8-PeCDF	0.00000086		0.00015		< 0.0000008		0.0028		0.00019		0.0062
2,3,7,8-TCDD	< 0.00000015		0.0000014		< 0.00000016		0.000016		0.0000011		0.00003
2,3,7,8-TCDF	0.00000019		0.0000076		< 0.00000016		0.000082		< 0.00000014		0.00012
OCDD	0.000016		0.00047		0.0000044		0.0023		0.00007		0.0027
OCDF	0.0000016		0.000036		< 0.0000016		0.00025		0.000008		0.0003
TOTAL HpCDD	0.0000039		0.00014		< 0.0000008		0.00097		0.000044		0.0013
TOTAL HpCDF	0.0000011		0.000089		< 0.0000008		0.0014		0.000087		0.0028
TOTAL HxCDD	< 0.00000076		0.000087		< 0.0000008		0.0014		0.00007		0.0026
TOTAL HxCDF	0.000003		0.00051		0.0000011		0.016		0.0009		0.023
TOTAL PeCDD	< 0.00000076		0.000047		< 0.0000008		0.001		0.000041		0.002
TOTAL PeCDF	0.0000074		0.0013		0.0000031		0.0073		0.0021		0.0096
TOTAL TCDD	< 0.00000015		0.000029		< 0.00000016		0.00038		0.000023		0.0008
TOTAL TCDF	0.0000031		0.00042		0.0000013		0.0069		0.0006		0.012

< - Compound not detected.
Value is detection limit.
mg/kg - milligrams per kilogram

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chemical.name	SED18 SED1804 6/22/2006 3.5-4	SED19 SED1901 6/22/2006 0-1	SED19 SED1903 6/22/2006 2-3	SED20 SED2001 6/22/2006 0.5-1	SED20 SED2003 6/22/2006 2.5-3	SED21 SED2101 6/22/2006 0-1	SED21 SED2103 6/22/2006 2.5-3	SED22 SED2201 6/22/2006 0-1	SED22 SED2203 6/22/2006 2-3	SED23 SED2301 6/22/2006 0-1	SED23 SED2303 6/22/2006 2-3
Volatile Organics (mg/kg)											
1,1,1,2-Tetrachloroethane	< 0.0313	< 0.017	< 0.0579	< 0.0149	< 0.0209	< 0.0044	< 0.0043	< 0.0126	< 0.0357	< 0.0041	< 0.0041
1,1,1-Trichloroethane	< 0.0313	0.635	6.65	< 0.0149	< 0.0209	< 0.0044	< 0.0043	< 0.0126	< 0.0357	< 0.0041	< 0.0041
1,1,2,2-Tetrachloroethane	< 0.0313	< 0.017	< 0.0579	< 0.0149	< 0.0209	< 0.0044	< 0.0043	< 0.0126	< 0.0357	< 0.0041	< 0.0041
1,1,2-Trichloroethane	< 0.0313	< 0.017	< 0.0579	< 0.0149	< 0.0209	< 0.0044	< 0.0043	< 0.0126	< 0.0357	< 0.0041	< 0.0041
1,1-Dichloroethane	< 0.0313	7.92	0.299	< 0.0149	< 0.0209	< 0.0044	< 0.0043	< 0.0126	< 0.0357	< 0.0041	< 0.0041
1,1-Dichloroethene	< 0.0313	11.3	0.8	< 0.0149	< 0.0209	< 0.0044	< 0.0043	< 0.0126	< 0.0357	< 0.0041	< 0.0041
1,1-Dichloropropene	< 0.0313	< 0.017	< 0.0579	< 0.0149	< 0.0209	< 0.0044	< 0.0043	< 0.0126	< 0.0357	< 0.0041	< 0.0041
1,2,3-Trichlorobenzene	< 0.0313	< 0.017	< 0.0579	< 0.0149	< 0.0209	< 0.0044	< 0.0043	< 0.0126	< 0.0357	< 0.0041	< 0.0041
1,2,3-Trichloropropane	< 0.0313	< 0.017	< 0.0579	< 0.0149	< 0.0209	< 0.0044	< 0.0043	< 0.0126	< 0.0357	< 0.0041	< 0.0041
1,2,4-Trichlorobenzene	< 0.0313	< 0.017	< 0.0579	< 0.0149	< 0.0209	< 0.0044	< 0.0043	< 0.0126	< 0.0357	< 0.0041	< 0.0041
1,2,4-Trimethylbenzene	< 0.0313	< 0.017	< 0.0579	< 0.0149	< 0.0209	< 0.0044	< 0.0043	< 0.0126	< 0.0357	< 0.0041	< 0.0041
1,2-Dibromo-3-Chloropropane	< 0.0313	< 0.017	< 0.0579	< 0.0149	< 0.0209	< 0.0044	< 0.0043	< 0.0126	< 0.0357	< 0.0041	< 0.0041
1,2-Dibromoethane	< 0.0313	< 0.017	< 0.0579	< 0.0149	< 0.0209	< 0.0044	< 0.0043	< 0.0126	< 0.0357	< 0.0041	< 0.0041
1,2-Dichlorobenzene	< 0.0313	< 0.017	< 0.0579	< 0.0149	< 0.0209	< 0.0044	< 0.0043	< 0.0126	< 0.0357	< 0.0041	< 0.0041
1,2-Dichloroethane	< 0.0313	< 0.017	< 0.0579	< 0.0149	< 0.0209	< 0.0044	< 0.0043	< 0.0126	< 0.0357	< 0.0041	< 0.0041
1,2-Dichloropropane	< 0.0313	< 0.017	< 0.0579	< 0.0149	< 0.0209	< 0.0044	< 0.0043	< 0.0126	< 0.0357	< 0.0041	< 0.0041
1,3,5-Trimethylbenzene	< 0.0313	< 0.017	< 0.0579	< 0.0149	< 0.0209	< 0.0044	< 0.0043	< 0.0126	< 0.0357	< 0.0041	< 0.0041
1,3-Dichlorobenzene	< 0.0313	< 0.017	< 0.0579	< 0.0149	< 0.0209	< 0.0044	< 0.0043	< 0.0126	< 0.0357	< 0.0041	< 0.0041
1,3-Dichloropropane	< 0.0313	< 0.017	< 0.0579	< 0.0149	< 0.0209	< 0.0044	< 0.0043	< 0.0126	< 0.0357	< 0.0041	< 0.0041
1,4-Dichlorobenzene	< 0.0313	< 0.017	< 0.0579	< 0.0149	< 0.0209	< 0.0044	< 0.0043	< 0.0126	< 0.0357	< 0.0041	< 0.0041
1,4-Dioxane	< 1.56	< 0.85	< 2.89	< 0.745	< 1.05	< 0.222	< 0.214	< 0.631	< 1.79	< 0.203	< 0.203
1-Chlorohexane	< 0.0313	< 0.017	< 0.0579	< 0.0149	< 0.0209	< 0.0044	< 0.0043	< 0.0126	< 0.0357	< 0.0041	< 0.0041
2,2-Dichloropropane	< 0.0313	< 0.017	< 0.0579	< 0.0149	< 0.0209	< 0.0044	< 0.0043	< 0.0126	< 0.0357	< 0.0041	< 0.0041
2-Butanone	< 0.313	< 0.17	0.936	< 0.149	< 0.209	< 0.0445	< 0.0428	< 0.126	< 0.357	< 0.0406	< 0.0406
2-Chlorotoluene	< 0.0313	< 0.017	< 0.0579	< 0.0149	< 0.0209	< 0.0044	< 0.0043	< 0.0126	< 0.0357	< 0.0041	< 0.0041
2-Hexanone	< 0.313	< 0.17	< 0.579	< 0.149	< 0.209	< 0.0445	< 0.0428	< 0.126	< 0.357	< 0.0406	< 0.0406
4-Chlorotoluene	< 0.0313	< 0.017	< 0.0579	< 0.0149	< 0.0209	< 0.0044	< 0.0043	< 0.0126	< 0.0357	< 0.0041	< 0.0041
4-Methyl-2-Pentanone	< 0.313	< 0.17	< 0.579	< 0.149	< 0.209	< 0.0445	< 0.0428	< 0.126	< 0.357	< 0.0406	< 0.0406
Acetone	0.796	0.242	1.94	0.421	0.57	< 0.0445	0.0608	0.294	1.08	< 0.0406	< 0.0406
Acrylonitrile											
Benzene	< 0.0313	< 0.017	< 0.0579	< 0.0149	< 0.0209	< 0.0044	< 0.0043	< 0.0126	< 0.0357	< 0.0041	< 0.0041
Bromobenzene	< 0.0313	< 0.017	< 0.0579	< 0.0149	< 0.0209	< 0.0044	< 0.0043	< 0.0126	< 0.0357	< 0.0041	< 0.0041
Bromochloromethane	< 0.0313	< 0.017	< 0.0579	< 0.0149	< 0.0209	< 0.0044	< 0.0043	< 0.0126	< 0.0357	< 0.0041	< 0.0041
Bromodichloromethane	< 0.0313	< 0.017	< 0.0579	< 0.0149	< 0.0209	< 0.0044	< 0.0043	< 0.0126	< 0.0357	< 0.0041	< 0.0041
Bromoform	< 0.0313	< 0.017	< 0.0579	< 0.0149	< 0.0209	< 0.0044	< 0.0043	< 0.0126	< 0.0357	< 0.0041	< 0.0041
Bromomethane	< 0.0626	< 0.034	< 0.116	< 0.0298	< 0.0418	< 0.0089	< 0.0086	< 0.0253	< 0.0714	< 0.0081	< 0.0081
Carbon Disulfide	< 0.0313	0.0576	0.212	< 0.0149	< 0.0209	< 0.0044	< 0.0043	< 0.0126	< 0.0357	< 0.0041	< 0.0041
Carbon tetrachloride	< 0.0313	< 0.017	< 0.0579	< 0.0149	< 0.0209	< 0.0044	< 0.0043	< 0.0126	< 0.0357	< 0.0041	< 0.0041
Chlorobenzene	< 0.0313	< 0.017	< 0.0579	< 0.0149	< 0.0209	< 0.0044	< 0.0043	< 0.0126	< 0.0357	< 0.0041	< 0.0041
Chloroethane	< 0.0626	< 0.034	< 0.116	< 0.0298	< 0.0418	< 0.0089	< 0.0086	< 0.0253	< 0.0714	< 0.0081	< 0.0081
Chloroform	< 0.0313	< 0.017	< 0.0579	< 0.0149	< 0.0209	< 0.0044	< 0.0043	< 0.0126	< 0.0357	< 0.0041	< 0.0041

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chemical.name	SED18 SED1804 6/22/2006 3.5-4	SED19 SED1901 6/22/2006 0-1	SED19 SED1903 6/22/2006 2-3	SED20 SED2001 6/22/2006 0.5-1	SED20 SED2003 6/22/2006 2.5-3	SED21 SED2101 6/22/2006 0-1	SED21 SED2103 6/22/2006 2.5-3	SED22 SED2201 6/22/2006 0-1	SED22 SED2203 6/22/2006 2-3	SED23 SED2301 6/22/2006 0-1	SED23 SED2303 6/22/2006 2-3
Chloromethane	< 0.0626	< 0.034	< 0.116	< 0.0298	< 0.0418	< 0.0089	< 0.0086	< 0.0253	< 0.0714	< 0.0081	< 0.0081
cis-1,2-Dichloroethene	< 0.0313	175	5.78	< 0.0149	< 0.0209	< 0.0044	0.0267	< 0.0126	< 0.0357	0.0091	0.0046
cis-1,3-Dichloropropene	< 0.0313	< 0.017	< 0.0579	< 0.0149	< 0.0209	< 0.0044	< 0.0043	< 0.0126	< 0.0357	< 0.0041	< 0.0041
Dibromochloromethane	< 0.0313	< 0.017	< 0.0579	< 0.0149	< 0.0209	< 0.0044	< 0.0043	< 0.0126	< 0.0357	< 0.0041	< 0.0041
Dibromomethane	< 0.0313	< 0.017	< 0.0579	< 0.0149	< 0.0209	< 0.0044	< 0.0043	< 0.0126	< 0.0357	< 0.0041	< 0.0041
Dichlorodifluoromethane	< 0.0626	< 0.034	< 0.116	< 0.0298	< 0.0418	< 0.0089	< 0.0086	< 0.0253	< 0.0714	< 0.0081	< 0.0081
Diethyl ether	< 0.0313	< 0.017	< 0.0579	< 0.0149	< 0.0209	< 0.0044	< 0.0043	< 0.0126	< 0.0357	< 0.0041	< 0.0041
Diisopropyl ether	< 0.0313	< 0.017	< 0.0579	< 0.0149	< 0.0209	< 0.0044	< 0.0043	< 0.0126	< 0.0357	< 0.0041	< 0.0041
Ethyl tertiary-butyl ether	< 0.0313	< 0.017	< 0.0579	< 0.0149	< 0.0209	< 0.0044	< 0.0043	< 0.0126	< 0.0357	< 0.0041	< 0.0041
Ethylbenzene	< 0.0313	< 0.017	< 0.0579	< 0.0149	< 0.0209	< 0.0044	< 0.0043	< 0.0126	< 0.0357	< 0.0041	< 0.0041
Hexachlorobutadiene	< 0.0313	< 0.017	< 0.0579	< 0.0149	< 0.0209	< 0.0044	< 0.0043	< 0.0126	< 0.0357	< 0.0041	< 0.0041
Isopropyl Benzene	< 0.0313	< 0.017	0.0688	< 0.0149	< 0.0209	< 0.0044	< 0.0043	< 0.0126	< 0.0357	< 0.0041	< 0.0041
m,p-Xylene	< 0.0626	< 0.034	< 0.116	< 0.0298	< 0.0418	< 0.0089	< 0.0086	< 0.0253	< 0.0714	< 0.0081	< 0.0081
Methylene Chloride	< 0.156	< 0.085	< 0.289	< 0.0745	< 0.105	< 0.0222	< 0.0214	< 0.0631	< 0.179	< 0.0203	< 0.0203
Methyl-t-butyl ether	< 0.0313	< 0.017	< 0.0579	< 0.0149	< 0.0209	< 0.0044	< 0.0043	< 0.0126	< 0.0357	< 0.0041	< 0.0041
Naphthalene	< 0.0313	< 0.017	< 0.0579	< 0.0149	< 0.0209	< 0.0044	< 0.0043	< 0.0126	< 0.0357	< 0.0041	< 0.0041
n-Butylbenzene	< 0.0313	< 0.017	< 0.0579	< 0.0149	< 0.0209	< 0.0044	< 0.0043	< 0.0126	< 0.0357	< 0.0041	< 0.0041
n-Propyl Benzene	< 0.0313	< 0.017	< 0.0579	< 0.0149	< 0.0209	< 0.0044	< 0.0043	< 0.0126	< 0.0357	< 0.0041	< 0.0041
o-Xylene	< 0.0313	< 0.017	< 0.0579	< 0.0149	< 0.0209	< 0.0044	< 0.0043	< 0.0126	< 0.0357	< 0.0041	< 0.0041
p-Isopropyl Toluene	< 0.0313	< 0.017	< 0.0579	< 0.0149	< 0.0209	< 0.0044	< 0.0043	< 0.0126	< 0.0357	< 0.0041	< 0.0041
s-Butylbenzene	< 0.0313	0.0197	0.0977	< 0.0149	< 0.0209	< 0.0044	< 0.0043	< 0.0126	< 0.0357	< 0.0041	< 0.0041
Styrene	< 0.0313	< 0.017	< 0.0579	< 0.0149	< 0.0209	< 0.0044	< 0.0043	< 0.0126	< 0.0357	< 0.0041	< 0.0041
t-Butylbenzene	< 0.0313	< 0.017	< 0.0579	< 0.0149	< 0.0209	< 0.0044	< 0.0043	< 0.0126	< 0.0357	< 0.0041	< 0.0041
Tertiary-amyl methyl ether	< 0.0313	< 0.017	< 0.0579	< 0.0149	< 0.0209	< 0.0044	< 0.0043	< 0.0126	< 0.0357	< 0.0041	< 0.0041
Tetrachloroethene	< 0.0313	18.1	27	< 0.0149	< 0.0209	< 0.0044	< 0.0043	< 0.0126	< 0.0357	1.04	0.0636
Tetrahydrofuran	< 0.0313	< 0.017	< 0.0579	< 0.0149	< 0.0209	< 0.0044	< 0.0043	< 0.0126	< 0.0357	< 0.0041	< 0.0041
Toluene	< 0.0313	< 0.017	< 0.0579	< 0.0149	< 0.0209	< 0.0044	< 0.0043	< 0.0126	< 0.0357	< 0.0041	< 0.0041
trans-1,2-Dichloroethene	< 0.0313	2.79	0.153	< 0.0149	< 0.0209	< 0.0044	< 0.0043	< 0.0126	< 0.0357	< 0.0041	< 0.0041
trans-1,3-Dichloropropene	< 0.0313	< 0.017	< 0.0579	< 0.0149	< 0.0209	< 0.0044	< 0.0043	< 0.0126	< 0.0357	< 0.0041	< 0.0041
Trichloroethene	< 0.0313	58.4	88	< 0.0149	< 0.0209	< 0.0044	< 0.0043	< 0.0126	< 0.0357	0.176	0.0255
Trichlorofluoromethane	< 0.0313	< 0.017	< 0.0579	< 0.0149	< 0.0209	< 0.0044	< 0.0043	< 0.0126	< 0.0357	< 0.0041	< 0.0041
Vinyl acetate		< 2.48	< 4.53							< 0.26	
Vinyl Chloride	0.107	0.148	< 0.116	< 0.0298	< 0.0418	< 0.0089	< 0.0086	< 0.0253	< 0.0714	< 0.0081	< 0.0081
Xylenes, Total	< 0.0939	< 0.051	< 0.174	< 0.0447	< 0.0627	< 0.0133	< 0.0129	< 0.0379	< 0.107	< 0.0122	< 0.0122
Semivolatile Organics (mg/kg)											
1,2,4-Trichlorobenzene											
1,2-Dichlorobenzene											
1,3-Dichlorobenzene											
1,4-Dichlorobenzene											
1-Methylnaphthalene	< 0.148	< 0.124	0.266	< 0.0612	< 0.104	< 0.0328	< 0.0301	< 0.0794	< 0.119	< 0.0322	< 0.0311
2,4,5-Trichlorophenol											
2,4,6-Trichlorophenol											

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2,4-Dichlorophenol											
2,4-Dimethylphenol											
2,4-Dinitrophenol											
2,4-Dinitrotoluene											
2,6-Dinitrotoluene											
2-Chloronaphthalene											
2-Chlorophenol											
2-Methylnaphthalene	< 0.148	< 0.124	< 0.198	< 0.0612	< 0.104	< 0.0328	< 0.0301	< 0.0794	< 0.119	< 0.0322	< 0.0311
2-Methylphenol (o-Cresol)											
2-Nitroaniline											
2-Nitrophenol											
3&4-Methylphenol											
3,3'-Dichlorobenzidine											
3-Nitroaniline											
4,6-Dinitro-2-methylphenol											
4-Bromophenyl-phenylether											
4-Chloro-3-methylphenol											
4-Chloroaniline											
4-Chlorophenyl-phenylether											
4-Nitroaniline											
4-Nitrophenol											
Acenaphthene	< 0.148	< 0.124	< 0.198	0.153	< 0.104	< 0.0328	< 0.0301	< 0.0794	< 0.119	< 0.0322	< 0.0311
Acenaphthylene	< 0.148	< 0.124	< 0.198	0.781	< 0.104	< 0.0328	< 0.0301	< 0.0794	< 0.119	< 0.0322	< 0.0311
Aniline											
Anthracene	< 0.148	< 0.124	< 0.198	3.09	< 0.104	< 0.0328	< 0.0301	< 0.0794	< 0.119	< 0.0322	< 0.0311
Azobenzene											
Benzo(a)anthracene	< 0.148	0.218	< 0.198	15.1	< 0.104	< 0.0328	< 0.0301	0.108	< 0.119	< 0.0322	< 0.0311
Benzo(a)pyrene	< 0.148	0.151	< 0.198	7.87	< 0.104	< 0.0328	< 0.0301	0.102	< 0.119	< 0.0322	< 0.0311
Benzo(b)fluoranthene	< 0.148	0.32	< 0.198	14.8	< 0.104	< 0.0328	< 0.0301	0.114	< 0.119	< 0.0322	< 0.0311
Benzo(g,h,i)perylene	< 0.148	< 0.124	< 0.198	2.54	< 0.104	< 0.0328	< 0.0301	< 0.0794	< 0.119	< 0.0322	< 0.0311
Benzo(k)fluoranthene	< 0.148	< 0.124	< 0.198	5.1	< 0.104	< 0.0328	< 0.0301	< 0.0794	< 0.119	< 0.0322	< 0.0311
Benzoic acid											
Benzyl alcohol											
Bis(2-chloroethoxy)methane											
Bis(2-chloroethyl)ether											
Bis(2-chloroisopropyl)ether											
bis(2-Ethylhexyl)phthalate											
Butylbenzylphthalate											
Chrysene	< 0.148	0.201	< 0.198	8.94	< 0.104	< 0.0328	< 0.0301	0.119	< 0.119	< 0.0322	< 0.0311
Dibenzo(a,h)anthracene	< 0.148	< 0.124	< 0.198	1.45	< 0.104	< 0.0328	< 0.0301	< 0.0794	< 0.119	< 0.0322	< 0.0311
Dibenzofuran											
Diethylphthalate											

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Dimethylphthalate											
Di-n-butylphthalate											
Di-n-octylphthalate											
Fluoranthene	< 0.148	0.533	< 0.198	28.8	< 0.104	< 0.0328	< 0.0301	0.235	< 0.119	< 0.0322	< 0.0311
Fluorene	< 0.148	< 0.124	< 0.198	0.863	< 0.104	< 0.0328	< 0.0301	< 0.0794	< 0.119	< 0.0322	< 0.0311
Hexachlorobenzene											
Hexachlorobutadiene											
Hexachlorocyclopentadiene											
Hexachloroethane											
Indeno(1,2,3-cd)pyrene	< 0.148	< 0.124	< 0.198	2.47	< 0.104	< 0.0328	< 0.0301	< 0.0794	< 0.119	< 0.0322	< 0.0311
Isophorone											
Naphthalene	< 0.148	< 0.124	< 0.198	< 0.0612	< 0.104	< 0.0328	< 0.0301	< 0.0794	< 0.119	< 0.0322	< 0.0311
Nitrobenzene											
N-Nitrosodimethylamine											
N-Nitroso-di-n-propylamine											
N-Nitrosodiphenylamine											
Pentachlorophenol											
Phenanthrene	< 0.148	0.218	< 0.198	11.8	< 0.104	< 0.0328	< 0.0301	0.121	< 0.119	< 0.0322	< 0.0311
Phenol											
Pyrene	< 0.148	0.35	< 0.198	15.2	< 0.104	< 0.0328	< 0.0301	< 0.0794	< 0.119	< 0.0322	< 0.0311
Pesticides/PCBs (mg/kg)											
4,4'-DDD		< 0.0247		0.0292		< 0.00692		< 0.0327		< 0.00685	
4,4'-DDE		< 0.0247		< 0.0112		< 0.00692		< 0.0327		< 0.00685	
4,4'-DDT		< 0.0247		< 0.0112		< 0.00692		< 0.0327		< 0.00685	
Aldrin		< 0.0247		< 0.0112		< 0.00692		< 0.0327		< 0.00685	
alpha-BHC		< 0.0247		< 0.0112		< 0.00692		< 0.0327		< 0.00685	
alpha-Chlordane		< 0.0247		< 0.0112		< 0.00692		< 0.0327		< 0.00685	
Aroclor-1016		< 0.246		< 0.112		< 0.0691		< 0.163		< 0.0685	
Aroclor-1221		< 0.246		< 0.112		< 0.0691		< 0.163		< 0.0685	
Aroclor-1232		< 0.246		< 0.112		< 0.0691		< 0.163		< 0.0685	
Aroclor-1242		< 0.246		< 0.112		< 0.0691		< 0.163		< 0.0685	
Aroclor-1248		< 0.246		< 0.112		< 0.0691		< 0.163		< 0.0685	
Aroclor-1254		< 0.246		< 0.112		< 0.0691		< 0.163		< 0.0685	
Aroclor-1260		0.605		< 0.112		< 0.0691		< 0.163		< 0.0685	
Aroclor-1262		< 0.246		< 0.112		< 0.0691		< 0.163		< 0.0685	
Aroclor-1268		< 0.246		< 0.112		< 0.0691		< 0.163		< 0.0685	
beta-BHC		< 0.0247		< 0.0112		< 0.00692		< 0.0327		< 0.00685	
Chlordane		< 0.247		< 0.112		< 0.0692		< 0.327		< 0.0685	
delta-BHC		< 0.0247		< 0.0112		< 0.00692		< 0.0327		< 0.00685	
Dieldrin		< 0.0247		< 0.0112		< 0.00692		< 0.0327		< 0.00685	
Endosulfan I		< 0.0247		< 0.0112		< 0.00692		< 0.0327		< 0.00685	
Endosulfan II		< 0.0247		< 0.0112		< 0.00692		< 0.0327		< 0.00685	

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Endosulfan sulfate		< 0.0247		< 0.0112		< 0.00692		< 0.0327		< 0.00685	
Endrin		< 0.0247		< 0.0112		< 0.00692		< 0.0327		< 0.00685	
Endrin aldehyde		< 0.0247		< 0.0112		< 0.00692		< 0.0327		< 0.00685	
Endrin ketone		0.0431		< 0.0112		< 0.00692		< 0.0327		< 0.00685	
gamma-BHC (Lindane)		< 0.0247		< 0.0112		< 0.00692		< 0.0327		< 0.00685	
gamma-Chlordane		< 0.0247		< 0.0112		< 0.00692		< 0.0327		< 0.00685	
Heptachlor		< 0.0247		< 0.0112		< 0.00692		< 0.0327		< 0.00685	
Heptachlor epoxide		< 0.0247		< 0.0112		< 0.00692		< 0.0327		< 0.00685	
Hexachlorobenzene		< 0.0247		< 0.0112		< 0.00692		< 0.0327		< 0.00685	
Methoxychlor		< 0.0247		< 0.0112		< 0.00692		< 0.0327		< 0.00685	
Toxaphene		< 1.23		< 0.562		< 0.346		< 1.63		< 0.343	
Antimony	< 32.3	< 23.6	< 47.4	< 13.1	< 24.4	< 7.4	< 6.8	< 15.9	< 27.6	< 7.4	< 6.6
Arsenic	18.2	36	244	< 0.7	2.2	2.1	< 1.7	12	< 6.9	< 1.8	< 1.7
Barium	18.7	224	89.2	25.3	< 12.2	13	5.4	125	33.6	13.1	7.8
Beryllium	< 0.32	1.03	0.52	< 0.13	< 0.25	0.14	< 0.07	0.32	1.17	< 0.07	< 0.07
Cadmium	< 3.23	7.11	6.35	< 1.31	< 2.44	< 0.74	< 0.68	2.8	< 2.76	< 0.74	< 0.66
Chromium	10.3	387	14.2	7.5	11.8	7.1	3	616	16.2	333	73.5
Copper	13	1880	33	14.6	5.9	20.1	2.3	1970	46	8.6	4.7
Lead	< 32.3	927	< 47.4	34.1	< 24.4	12.2	< 6.8	426	< 27.6	< 7.4	< 6.6
Mercury	< 0.196	2.52	< 0.269	< 0.067	< 0.14	< 0.043	< 0.039	0.677	< 0.156	< 0.044	< 0.04
Nickel	17.7	433	458	< 6.6	< 12.2	6.8	< 3.4	86	< 13.8	< 3.7	< 3.3
Selenium	< 32.3	< 23.6	< 47.4	< 13.1	< 24.4	< 7.4	< 6.8	< 15.9	< 27.6	< 7.4	< 6.6
Silver	< 3.23	192	4.87	< 1.31	< 2.44	2.77	< 0.68	163	< 2.76	< 0.74	< 0.66
Thallium	< 8.1	< 5.9	< 11.8	< 3.3	< 6.1	< 1.8	< 1.7	< 4	< 6.9	< 1.8	< 1.7
Zinc	27.9	1830	588	38.8	< 12.2	71.6	9.6	1360	37.3	9.5	7.9
Total Cyanide											
Total Organic Carbon (TOC)		69600		26000		5300		24000		2800	
TPH (mg/kg)											
Total Petroleum Hydrocarbons (TPH)		756		1810		57.8		190		< 50.1	
Dioxins/Furans (mg/kg)											
1,2,3,4,6,7,8-HpCDD		0.00027		0.00009		0.0000045		0.00011		< 0.00000068	
1,2,3,4,6,7,8-HpCDF		0.00051		0.0002		0.0000065		0.00016		< 0.00000068	
1,2,3,4,7,8,9-HpCDF		0.00011		0.000041		0.0000012		0.000025		< 0.00000068	
1,2,3,4,7,8-HxCDD		0.000051		0.000015		< 0.00000084		< 0.000018		< 0.00000068	
1,2,3,4,7,8-HxCDF		0.00039		0.00014		0.0000034		0.000068		< 0.00000068	
1,2,3,6,7,8-HxCDD		0.00012		0.000035		0.0000013		0.000028		< 0.00000068	
1,2,3,6,7,8-HxCDF		0.00062		0.00014		0.0000073		0.00016		< 0.00000068	
1,2,3,7,8,9-HxCDD		0.000059		0.000016		< 0.00000084		< 0.000018		< 0.00000068	
1,2,3,7,8,9-HxCDF		0.00025		0.000052		0.0000024		0.000062		< 0.00000068	
1,2,3,7,8-PeCDD		0.000069		0.00003		0.00000095		0.000018		< 0.00000068	
1,2,3,7,8-PeCDF		< 0.0000027		< 0.0000012		0.0000023		0.000041		< 0.00000068	
2,3,4,6,7,8-HxCDF		0.00054		0.00012		0.000016		0.00015		< 0.00000068	

Table A2
Sediment Data (0-7 ft)
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chemical.name	SED18 SED1804 6/22/2006 3.5-4	SED19 SED1901 6/22/2006 0-1	SED19 SED1903 6/22/2006 2-3	SED20 SED2001 6/22/2006 0.5-1	SED20 SED2003 6/22/2006 2.5-3	SED21 SED2101 6/22/2006 0-1	SED21 SED2103 6/22/2006 2.5-3	SED22 SED2201 6/22/2006 0-1	SED22 SED2203 6/22/2006 2-3	SED23 SED2301 6/22/2006 0-1	SED23 SED2303 6/22/2006 2-3
2,3,4,7,8-PeCDF		0.0035		0.00014		0.000044		0.0013		< 0.00000068	
2,3,7,8-TCDD		0.000021		0.0000073		< 0.00000017		0.0000068		< 0.00000014	
2,3,7,8-TCDF		0.000058		0.0000093		< 0.00000017		0.000027		< 0.00000014	
OCDD		0.00093		0.00024		0.000025		0.0005		0.0000035	
OCDF		0.0001		0.000082		0.0000022		0.000044		< 0.0000014	
TOTAL HpCDD		0.00058		0.00019		0.0000088		0.00024		< 0.00000068	
TOTAL HpCDF		0.0014		0.0005		0.000017		0.00042		< 0.00000068	
TOTAL HxCDD		0.0016		0.00047		0.000013		0.00031		< 0.00000068	
TOTAL HxCDF		0.012		0.0046		0.0002		0.0055		0.0000017	
TOTAL PeCDD		0.0014		0.00039		0.0000081		0.0002		< 0.00000068	
TOTAL PeCDF		0.0088		0.0069		0.00046		0.014		0.0000044	
TOTAL TCDD		0.00051		0.00016		0.0000036		0.00015		< 0.00000014	
TOTAL TCDF		0.0065		0.0014		0.00014		0.0045		0.0000012	

< - Compound not detected.
Value is detection limit.
mg/kg - milligrams per kilogram

Table A2
Sediment Data (0-7 ft)
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chemical.name	SED24 SED2401 6/22/2006 0-1	SED24 SED2403 6/22/2006 2-3	SED25 SED2501 6/22/2006 0-1	SED25 SED2503 6/22/2006 2.5-3	SED25 SED2507 6/23/2006 6-7	SED26 SED2601 6/22/2006 0-1	SED26 SED2602 6/22/2006 1.5-2	SED26 SED2605 6/22/2006 4-5	SED27 SED2701 6/22/2006 0-1	SED27 SED2703 6/22/2006 2.5-3	SED28 SED2801 6/21/2006 0.5-1
Volatile Organics (mg/kg)											
1,1,1,2-Tetrachloroethane	< 0.0079	< 0.0253	< 0.0088	< 0.0311	< 0.0521	< 0.008	< 0.0118		< 0.0198	< 0.0046	< 0.0226
1,1,1-Trichloroethane	< 0.0079	< 0.0253	< 0.0088	< 0.0311	< 0.0521	< 0.008	< 0.0118		< 0.0198	0.384	< 0.0226
1,1,2,2-Tetrachloroethane	< 0.0079	< 0.0253	< 0.0088	< 0.0311	< 0.0521	< 0.008	< 0.0118		< 0.0198	< 0.0046	< 0.0226
1,1,2-Trichloroethane	< 0.0079	< 0.0253	< 0.0088	< 0.0311	< 0.0521	< 0.008	< 0.0118		< 0.0198	< 0.0046	< 0.0226
1,1-Dichloroethane	0.011	0.0544	1.09	0.051	< 0.0521	< 0.008	< 0.0118		4.67	0.0054	0.0266
1,1-Dichloroethene	< 0.0079	< 0.0253	< 0.0088	< 0.0311	< 0.0521	< 0.008	< 0.0118		2.34	0.0144	< 0.0226
1,1-Dichloropropene	< 0.0079	< 0.0253	< 0.0088	< 0.0311	< 0.0521	< 0.008	< 0.0118		< 0.0198	< 0.0046	< 0.0226
1,2,3-Trichlorobenzene	< 0.0079	< 0.0253	< 0.0088	< 0.0311	< 0.0521	< 0.008	< 0.0118		< 0.0198	< 0.0046	< 0.0226
1,2,3-Trichloropropane	< 0.0079	< 0.0253	< 0.0088	< 0.0311	< 0.0521	< 0.008	< 0.0118		< 0.0198	< 0.0046	< 0.0226
1,2,4-Trichlorobenzene	< 0.0079	< 0.0253	< 0.0088	< 0.0311	< 0.0521	< 0.008	< 0.0118		< 0.0198	< 0.0046	< 0.0226
1,2,4-Trimethylbenzene	< 0.0079	< 0.0253	< 0.0088	< 0.0311	< 0.0521	< 0.008	< 0.0118		< 0.0198	< 0.0046	< 0.0226
1,2-Dibromo-3-Chloropropane	< 0.0079	< 0.0253	< 0.0088	< 0.0311	< 0.0521	< 0.008	< 0.0118		< 0.0198	< 0.0046	< 0.0226
1,2-Dibromoethane	< 0.0079	< 0.0253	< 0.0088	< 0.0311	< 0.0521	< 0.008	< 0.0118		< 0.0198	< 0.0046	< 0.0226
1,2-Dichlorobenzene	< 0.0079	< 0.0253	< 0.0088	< 0.0311	< 0.0521	< 0.008	< 0.0118		< 0.0198	< 0.0046	< 0.0226
1,2-Dichloroethane	< 0.0079	< 0.0253	< 0.0088	< 0.0311	< 0.0521	< 0.008	< 0.0118		< 0.0198	< 0.0046	< 0.0226
1,2-Dichloropropane	< 0.0079	< 0.0253	< 0.0088	< 0.0311	< 0.0521	< 0.008	< 0.0118		< 0.0198	< 0.0046	< 0.0226
1,3,5-Trimethylbenzene	< 0.0079	< 0.0253	< 0.0088	< 0.0311	< 0.0521	< 0.008	< 0.0118		< 0.0198	< 0.0046	< 0.0226
1,3-Dichlorobenzene	< 0.0079	< 0.0253	< 0.0088	< 0.0311	< 0.0521	< 0.008	< 0.0118		< 0.0198	< 0.0046	< 0.0226
1,3-Dichloropropane	< 0.0079	< 0.0253	< 0.0088	< 0.0311	< 0.0521	< 0.008	< 0.0118		< 0.0198	< 0.0046	< 0.0226
1,4-Dichlorobenzene	< 0.0079	< 0.0253	< 0.0088	< 0.0311	< 0.0521	< 0.008	< 0.0118		< 0.0198	< 0.0046	< 0.0226
1,4-Dioxane	< 0.396	< 1.27	< 0.439	< 1.55	< 2.6	< 0.399	< 0.591		< 0.992	< 0.229	< 1.13
1-Chlorohexane	< 0.0079	< 0.0253	< 0.0088	< 0.0311	< 0.0521	< 0.008	< 0.0118		< 0.0198	< 0.0046	< 0.0226
2,2-Dichloropropane	< 0.0079	< 0.0253	< 0.0088	< 0.0311	< 0.0521	< 0.008	< 0.0118		< 0.0198	< 0.0046	< 0.0226
2-Butanone	< 0.0791	< 0.253	< 0.0877	0.442	< 0.521	< 0.0798	< 0.118		< 0.198	< 0.0459	< 0.226
2-Chlorotoluene	< 0.0079	< 0.0253	< 0.0088	< 0.0311	< 0.0521	< 0.008	< 0.0118		< 0.0198	< 0.0046	< 0.0226
2-Hexanone	< 0.0791	< 0.253	< 0.0877	< 0.311	< 0.521	< 0.0798	< 0.118		< 0.198	< 0.0459	< 0.226
4-Chlorotoluene	< 0.0079	< 0.0253	< 0.0088	< 0.0311	< 0.0521	< 0.008	< 0.0118		< 0.0198	< 0.0046	< 0.0226
4-Methyl-2-Pentanone	< 0.0791	< 0.253	< 0.0877	< 0.311	< 0.521	< 0.0798	< 0.118		< 0.198	< 0.0459	< 0.226
Acetone	< 0.0791	0.834	0.128	1.68	0.892	0.0856	< 0.118		< 0.198	< 0.0459	0.384
Acrylonitrile											
Benzene	< 0.0079	< 0.0253	< 0.0088	< 0.0311	< 0.0521	< 0.008	< 0.0118		< 0.0198	< 0.0046	< 0.0226
Bromobenzene	< 0.0079	< 0.0253	< 0.0088	< 0.0311	< 0.0521	< 0.008	< 0.0118		< 0.0198	< 0.0046	< 0.0226
Bromochloromethane	< 0.0079	< 0.0253	< 0.0088	< 0.0311	< 0.0521	< 0.008	< 0.0118		< 0.0198	< 0.0046	< 0.0226
Bromodichloromethane	< 0.0079	< 0.0253	< 0.0088	< 0.0311	< 0.0521	< 0.008	< 0.0118		< 0.0198	< 0.0046	< 0.0226
Bromoform	< 0.0079	< 0.0253	< 0.0088	< 0.0311	< 0.0521	< 0.008	< 0.0118		< 0.0198	< 0.0046	< 0.0226
Bromomethane	< 0.0158	< 0.0507	< 0.0175	< 0.0622	< 0.104	< 0.016	< 0.0236		< 0.0397	< 0.0092	< 0.0452
Carbon Disulfide	< 0.0079	< 0.0253	0.0111	< 0.0311	0.0729	< 0.008	< 0.0118		0.0398	0.0068	< 0.0226
Carbon tetrachloride	< 0.0079	< 0.0253	< 0.0088	< 0.0311	< 0.0521	< 0.008	< 0.0118		< 0.0198	< 0.0046	< 0.0226
Chlorobenzene	< 0.0079	< 0.0253	< 0.0088	< 0.0311	< 0.0521	< 0.008	< 0.0118		< 0.0198	< 0.0046	< 0.0226
Chloroethane	< 0.0158	< 0.0507	< 0.0175	< 0.0622	< 0.104	< 0.016	< 0.0236		< 0.0397	< 0.0092	< 0.0452
Chloroform	< 0.0079	< 0.0253	< 0.0088	< 0.0311	< 0.0521	< 0.008	< 0.0118		< 0.0198	< 0.0046	< 0.0226

Table A2
Sediment Data (0-7 ft)
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chemical.name	SED24 SED2401 6/22/2006 0-1	SED24 SED2403 6/22/2006 2-3	SED25 SED2501 6/22/2006 0-1	SED25 SED2503 6/22/2006 2.5-3	SED25 SED2507 6/23/2006 6-7	SED26 SED2601 6/22/2006 0-1	SED26 SED2602 6/22/2006 1.5-2	SED26 SED2605 6/22/2006 4-5	SED27 SED2701 6/22/2006 0-1	SED27 SED2703 6/22/2006 2.5-3	SED28 SED2801 6/21/2006 0.5-1
Chloromethane	< 0.0158	< 0.0507	< 0.0175	< 0.0622	< 0.104	< 0.016	< 0.0236		< 0.0397	< 0.0092	< 0.0452
cis-1,2-Dichloroethene	< 0.0079	< 0.0253	11.5	0.0822	0.56	< 0.008	< 0.0118		103	0.0386	< 0.0226
cis-1,3-Dichloropropene	< 0.0079	< 0.0253	< 0.0088	< 0.0311	< 0.0521	< 0.008	< 0.0118		< 0.0198	< 0.0046	< 0.0226
Dibromochloromethane	< 0.0079	< 0.0253	< 0.0088	< 0.0311	< 0.0521	< 0.008	< 0.0118		< 0.0198	< 0.0046	< 0.0226
Dibromomethane	< 0.0079	< 0.0253	< 0.0088	< 0.0311	< 0.0521	< 0.008	< 0.0118		< 0.0198	< 0.0046	< 0.0226
Dichlorodifluoromethane	< 0.0158	< 0.0507	< 0.0175	< 0.0622	< 0.104	< 0.016	< 0.0236		< 0.0397	< 0.0092	< 0.0452
Diethyl ether	< 0.0079	< 0.0253	< 0.0088	< 0.0311	< 0.0521	< 0.008	< 0.0118		< 0.0198	< 0.0046	< 0.0226
Diisopropyl ether	< 0.0079	< 0.0253	< 0.0088	< 0.0311	< 0.0521	< 0.008	< 0.0118		< 0.0198	< 0.0046	< 0.0226
Ethyl tertiary-butyl ether	< 0.0079	< 0.0253	< 0.0088	< 0.0311	< 0.0521	< 0.008	< 0.0118		< 0.0198	< 0.0046	< 0.0226
Ethylbenzene	< 0.0079	< 0.0253	< 0.0088	< 0.0311	< 0.0521	< 0.008	< 0.0118		< 0.0198	< 0.0046	< 0.0226
Hexachlorobutadiene	< 0.0079	< 0.0253	< 0.0088	< 0.0311	< 0.0521	< 0.008	< 0.0118		< 0.0198	< 0.0046	< 0.0226
Isopropyl Benzene	< 0.0079	< 0.0253	< 0.0088	0.0738	< 0.0521	< 0.008	< 0.0118		< 0.0198	< 0.0046	0.0514
m,p-Xylene	< 0.0158	< 0.0507	< 0.0175	< 0.0622	< 0.104	< 0.016	< 0.0236		< 0.0397	< 0.0092	< 0.0452
Methylene Chloride	< 0.0396	< 0.127	< 0.0439	< 0.155	< 0.26	< 0.0399	< 0.0591		< 0.0992	< 0.0229	< 0.113
Methyl-t-butyl ether	< 0.0079	< 0.0253	< 0.0088	< 0.0311	< 0.0521	< 0.008	< 0.0118		< 0.0198	< 0.0046	< 0.0226
Naphthalene	< 0.0079	< 0.0253	< 0.0088	< 0.0311	< 0.0521	< 0.008	< 0.0118		< 0.0198	< 0.0046	< 0.0226
n-Butylbenzene	< 0.0079	< 0.0253	< 0.0088	< 0.0311	< 0.0521	< 0.008	< 0.0118		< 0.0198	< 0.0046	< 0.0226
n-Propyl Benzene	< 0.0079	< 0.0253	< 0.0088	< 0.0311	< 0.0521	< 0.008	< 0.0118		< 0.0198	< 0.0046	< 0.0226
o-Xylene	< 0.0079	< 0.0253	< 0.0088	< 0.0311	< 0.0521	< 0.008	< 0.0118		< 0.0198	< 0.0046	< 0.0226
p-Isopropyl Toluene	< 0.0079	< 0.0253	< 0.0088	< 0.0311	< 0.0521	< 0.008	< 0.0118		< 0.0198	< 0.0046	< 0.0226
s-Butylbenzene	< 0.0079	< 0.0253	< 0.0088	0.0563	< 0.0521	< 0.008	< 0.0118		< 0.0198	< 0.0046	0.0303
Styrene	< 0.0079	< 0.0253	< 0.0088	< 0.0311	< 0.0521	< 0.008	< 0.0118		< 0.0198	< 0.0046	< 0.0226
t-Butylbenzene	< 0.0079	< 0.0253	< 0.0088	< 0.0311	< 0.0521	< 0.008	< 0.0118		< 0.0198	< 0.0046	< 0.0226
Tertiary-amyl methyl ether	< 0.0079	< 0.0253	< 0.0088	< 0.0311	< 0.0521	< 0.008	< 0.0118		< 0.0198	< 0.0046	< 0.0226
Tetrachloroethene	< 0.0079	< 0.0253	< 0.0088	< 0.0311	< 0.0521	< 0.008	< 0.0118		< 0.0198	0.0154	< 0.0226
Tetrahydrofuran	< 0.0079	< 0.0253	< 0.0088	< 0.0311	< 0.0521	< 0.008	< 0.0118		< 0.0198	< 0.0046	< 0.0226
Toluene	< 0.0079	< 0.0253	< 0.0088	< 0.0311	< 0.0521	< 0.008	< 0.0118		< 0.0198	< 0.0046	< 0.0226
trans-1,2-Dichloroethene	< 0.0079	< 0.0253	< 0.0088	< 0.0311	< 0.0521	< 0.008	< 0.0118		3.62	< 0.0046	< 0.0226
trans-1,3-Dichloropropene	< 0.0079	< 0.0253	< 0.0088	< 0.0311	< 0.0521	< 0.008	< 0.0118		< 0.0198	< 0.0046	< 0.0226
Trichloroethene	< 0.0079	< 0.0253	0.276	0.0313	< 0.0521	< 0.008	< 0.0118		15.1	0.691	< 0.0226
Trichlorofluoromethane	< 0.0079	< 0.0253	< 0.0088	< 0.0311	< 0.0521	< 0.008	< 0.0118		< 0.0198	< 0.0046	< 0.0226
Vinyl acetate			< 1.38						< 2.58	< 0.314	
Vinyl Chloride	0.0218	0.191	24.8	0.91	0.591	< 0.016	< 0.0236		5.42	< 0.0092	0.0499
Xylenes, Total	< 0.0237	< 0.076	< 0.0263	< 0.0933	< 0.156	< 0.024	< 0.0354		< 0.0595	< 0.0138	< 0.0678
Semivolatile Organics (mg/kg)											
1,2,4-Trichlorobenzene											
1,2-Dichlorobenzene											
1,3-Dichlorobenzene											
1,4-Dichlorobenzene											
1-Methylnaphthalene	< 0.0631	< 0.125	< 0.0829	< 0.215	< 0.209	< 0.0463	< 0.0518	< 0.137	< 0.124	< 0.031	< 0.0912
2,4,5-Trichlorophenol											
2,4,6-Trichlorophenol											

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chemical.name	SED24 SED2401 6/22/2006 0-1	SED24 SED2403 6/22/2006 2-3	SED25 SED2501 6/22/2006 0-1	SED25 SED2503 6/22/2006 2.5-3	SED25 SED2507 6/23/2006 6-7	SED26 SED2601 6/22/2006 0-1	SED26 SED2602 6/22/2006 1.5-2	SED26 SED2605 6/22/2006 4-5	SED27 SED2701 6/22/2006 0-1	SED27 SED2703 6/22/2006 2.5-3	SED28 SED2801 6/21/2006 0.5-1
2,4-Dichlorophenol											
2,4-Dimethylphenol											
2,4-Dinitrophenol											
2,4-Dinitrotoluene											
2,6-Dinitrotoluene											
2-Chloronaphthalene											
2-Chlorophenol											
2-Methylnaphthalene	< 0.0631	< 0.125	< 0.0829	< 0.215	< 0.209	< 0.0463	< 0.0518	< 0.137	< 0.124	< 0.031	< 0.0912
2-Methylphenol (o-Cresol)											
2-Nitroaniline											
2-Nitrophenol											
3&4-Methylphenol											
3,3'-Dichlorobenzidine											
3-Nitroaniline											
4,6-Dinitro-2-methylphenol											
4-Bromophenyl-phenylether											
4-Chloro-3-methylphenol											
4-Chloroaniline											
4-Chlorophenyl-phenylether											
4-Nitroaniline											
4-Nitrophenol											
Acenaphthene	< 0.0631	< 0.125	< 0.0829	< 0.215	< 0.209	< 0.0463	< 0.0518	< 0.137	< 0.124	< 0.031	< 0.0912
Acenaphthylene	< 0.0631	< 0.125	< 0.0829	< 0.215	< 0.209	< 0.0463	< 0.0518	< 0.137	< 0.124	< 0.031	< 0.0912
Aniline											
Anthracene	< 0.0631	< 0.125	0.163	< 0.215	< 0.209	< 0.0463	< 0.0518	< 0.137	< 0.124	< 0.031	0.403
Azobenzene											
Benzo(a)anthracene	0.0896	< 0.125	0.541	< 0.215	< 0.209	0.241	< 0.0518	< 0.137	0.134	< 0.031	1.29
Benzo(a)pyrene	0.0707	< 0.125	0.483	< 0.215	< 0.209	0.273	< 0.0518	< 0.137	< 0.124	< 0.031	0.993
Benzo(b)fluoranthene	0.0732	< 0.125	0.516	< 0.215	< 0.209	0.256	< 0.0518	< 0.137	0.285	< 0.031	1.49
Benzo(g,h,i)perylene	< 0.0631	< 0.125	0.27	< 0.215	< 0.209	0.144	< 0.0518	< 0.137	< 0.124	< 0.031	0.296
Benzo(k)fluoranthene	< 0.0631	< 0.125	< 0.0829	< 0.215	< 0.209	< 0.0463	< 0.0518	< 0.137	< 0.124	< 0.031	0.668
Benzoic acid											
Benzyl alcohol											
Bis(2-chloroethoxy)methane											
Bis(2-chloroethyl)ether											
Bis(2-chloroisopropyl)ether											
bis(2-Ethylhexyl)phthalate											
Butylbenzylphthalate											
Chrysene	0.0896	< 0.125	0.534	< 0.215	< 0.209	0.227	< 0.0518	< 0.137	< 0.124	< 0.031	1.16
Dibenzo(a,h)anthracene	< 0.0631	< 0.125	< 0.0829	< 0.215	< 0.209	< 0.0463	< 0.0518	< 0.137	< 0.124	< 0.031	0.0912
Dibenzofuran											
Diethylphthalate											

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chemical.name	SED24 SED2401 6/22/2006 0-1	SED24 SED2403 6/22/2006 2-3	SED25 SED2501 6/22/2006 0-1	SED25 SED2503 6/22/2006 2.5-3	SED25 SED2507 6/23/2006 6-7	SED26 SED2601 6/22/2006 0-1	SED26 SED2602 6/22/2006 1.5-2	SED26 SED2605 6/22/2006 4-5	SED27 SED2701 6/22/2006 0-1	SED27 SED2703 6/22/2006 2.5-3	SED28 SED2801 6/21/2006 0.5-1
Dimethylphthalate											
Di-n-butylphthalate											
Di-n-octylphthalate											
Fluoranthene	0.211	0.211	3.17	< 0.215	< 0.209	0.419	< 0.0518	< 0.137	0.354	< 0.031	2.31
Fluorene	< 0.0631	< 0.125	< 0.0829	< 0.215	< 0.209	< 0.0463	< 0.0518	< 0.137	< 0.124	< 0.031	0.135
Hexachlorobenzene											
Hexachlorobutadiene											
Hexachlorocyclopentadiene											
Hexachloroethane											
Indeno(1,2,3-cd)pyrene	< 0.0631	< 0.125	0.27	< 0.215	< 0.209	0.133	< 0.0518	< 0.137	< 0.124	< 0.031	0.314
Isophorone											
Naphthalene	< 0.0631	< 0.125	< 0.0829	< 0.215	< 0.209	< 0.0463	< 0.0518	< 0.137	< 0.124	< 0.031	< 0.0912
Nitrobenzene											
N-Nitrosodimethylamine											
N-Nitroso-di-n-propylamine											
N-Nitrosodiphenylamine											
Pentachlorophenol											
Phenanthrene	0.169	0.135	2.46	< 0.215	< 0.209	0.158	< 0.0518	< 0.137	< 0.124	< 0.031	1.14
Phenol											
Pyrene	0.177	< 0.125	2.4	< 0.215	< 0.209	0.348	< 0.0518	< 0.137	0.196	< 0.031	1.29
Pesticides/PCBs (mg/kg)											
4,4'-DDD	< 0.0229		< 0.0309			< 0.0189			< 0.0481		< 0.0193
4,4'-DDE	< 0.0229		< 0.0309			< 0.0189			< 0.0481		< 0.0193
4,4'-DDT	< 0.0229		< 0.0309			< 0.0189			< 0.0481		< 0.0193
Aldrin	< 0.0229		< 0.0309			< 0.0189			< 0.0481		< 0.0193
alpha-BHC	< 0.0229		< 0.0309			< 0.0189			< 0.0481		< 0.0193
alpha-Chlordane	< 0.0229		< 0.0309			< 0.0189			< 0.0481		< 0.0193
Aroclor-1016	< 0.125		< 0.168			< 0.093			< 0.245		< 0.193
Aroclor-1221	< 0.125		< 0.168			< 0.093			< 0.245		< 0.193
Aroclor-1232	< 0.125		< 0.168			< 0.093			< 0.245		< 0.193
Aroclor-1242	< 0.125		< 0.168			< 0.093			< 0.245		< 0.193
Aroclor-1248	< 0.125		< 0.168			< 0.093			< 0.245		< 0.193
Aroclor-1254	0.207		< 0.168			< 0.093			< 0.245		< 0.193
Aroclor-1260	< 0.125		< 0.168			< 0.093			< 0.245		< 0.193
Aroclor-1262	< 0.125		< 0.168			< 0.093			< 0.245		< 0.193
Aroclor-1268	< 0.125		< 0.168			< 0.093			< 0.245		< 0.193
beta-BHC	< 0.0229		< 0.0309			< 0.0189			< 0.0481		< 0.0193
Chlordane	< 0.229		< 0.309			< 0.189			< 0.481		< 0.193
delta-BHC	< 0.0229		< 0.0309			< 0.0189			< 0.0481		< 0.0193
Dieldrin	< 0.0229		< 0.0309			< 0.0189			< 0.0481		< 0.0193
Endosulfan I	< 0.0229		< 0.0309			< 0.0189			< 0.0481		< 0.0193
Endosulfan II	< 0.0229		< 0.0309			< 0.0189			< 0.0481		< 0.0193

Table A2
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chemical.name	SED24 SED2401 6/22/2006 0-1	SED24 SED2403 6/22/2006 2-3	SED25 SED2501 6/22/2006 0-1	SED25 SED2503 6/22/2006 2.5-3	SED25 SED2507 6/23/2006 6-7	SED26 SED2601 6/22/2006 0-1	SED26 SED2602 6/22/2006 1.5-2	SED26 SED2605 6/22/2006 4-5	SED27 SED2701 6/22/2006 0-1	SED27 SED2703 6/22/2006 2.5-3	SED28 SED2801 6/21/2006 0.5-1
Endosulfan sulfate	< 0.0229		< 0.0309			< 0.0189			< 0.0481		< 0.0193
Endrin	< 0.0229		< 0.0309			< 0.0189			< 0.0481		< 0.0193
Endrin aldehyde	< 0.0229		< 0.0309			< 0.0189			< 0.0481		< 0.0193
Endrin ketone	< 0.0229		< 0.0309			< 0.0189			< 0.0481		< 0.0193
gamma-BHC (Lindane)	< 0.0229		< 0.0309			< 0.0189			< 0.0481		< 0.0193
gamma-Chlordane	< 0.0229		< 0.0309			< 0.0189			< 0.0481		< 0.0193
Heptachlor	< 0.0229		< 0.0309			< 0.0189			< 0.0481		< 0.0193
Heptachlor epoxide	< 0.0229		< 0.0309			< 0.0189			< 0.0481		< 0.0193
Hexachlorobenzene	< 0.0229		< 0.0309			< 0.0189			< 0.0481		< 0.0193
Methoxychlor	< 0.0229		< 0.0309			< 0.0189			< 0.0481		< 0.0193
Toxaphene	< 1.15		< 1.54			< 0.945			< 2.4		< 0.965
Antimony	< 9.8	< 25.3	< 13.1	< 46.3	< 46.3	< 10.1	< 12.2	< 28.9	< 16.6	< 7.2	< 19.7
Arsenic	9.3	20.7	22.4	115	78.6	36.1	55.2	< 7.2	36.6	4.1	33.8
Barium	82.4	73.8	207	85.7	< 23.1	466	2430	93.2	123	14.2	202
Beryllium	0.28	0.41	0.58	< 0.47	< 0.47	0.87	1.75	0.29	0.85	< 0.07	0.64
Cadmium	2.87	< 2.53	4.56	< 4.63	< 4.63	1.57	2.06	< 2.89	4.39	< 0.72	4.73
Chromium	532	34.3	300	19.6	10.4	18.8	25.3	8.4	148	4.6	372
Copper	1930	200	1890	51.8	10.7	180	144	19.7	892	454	1930
Lead	520	76.4	672	< 46.3	< 46.3	219	182	< 28.9	507	< 7.2	659
Mercury	0.653	0.171	0.159	< 0.278	< 0.269	0.637	0.477	< 0.17	< 0.12	< 0.042	1.21
Nickel	55.6	16.3	113	46.4	43.8	274	33.1	< 14.4	853	18.6	118
Selenium	< 9.8	< 25.3	< 13.1	< 46.3	< 46.3	17.9	38.7	< 28.9	< 16.6	< 7.2	< 19.7
Silver	107	31.9	140	< 4.63	< 4.63	37.9	14.1	< 2.89	78.3	< 0.72	132
Thallium	< 2.5	< 6.3	< 3.3	< 11.6	< 11.6	< 2.5	3.2	< 7.2	< 4.1	< 1.8	< 4.9
Zinc	1920	157	1360	77.6	84.8	209	166	19.8	1300	24.3	1420
Total Cyanide											
Total Organic Carbon (TOC)	23000		46100			29600			46000		41000
TPH (mg/kg)											
Total Petroleum Hydrocarbons (TPH)	226		380			88.8			413		394
Dioxins/Furans (mg/kg)											
1,2,3,4,6,7,8-HpCDD	0.000029		0.00032			0.00002			0.00018		0.00049
1,2,3,4,6,7,8-HpCDF	0.000029		0.00044			0.0000059			0.00023		0.00064
1,2,3,4,7,8,9-HpCDF	0.0000045		0.000079			< 0.0000014			0.000036		0.000099
1,2,3,4,7,8-HxCDD	0.0000013		0.00003			< 0.0000014			< 0.000021		0.000039
1,2,3,4,7,8-HxCDF	0.000012		0.00031			0.0000024			0.00013		0.0003
1,2,3,6,7,8-HxCDD	0.0000054		0.000083			0.0000036			0.000037		0.00011
1,2,3,6,7,8-HxCDF	0.000016		0.00038			< 0.0000014			0.00015		0.00052
1,2,3,7,8,9-HxCDD	0.0000028		0.000038			0.0000017			0.000022		0.000068
1,2,3,7,8,9-HxCDF	0.000007		0.00018			< 0.0000014			0.000075		0.0002
1,2,3,7,8-PeCDD	0.0000024		0.000063			< 0.0000014			0.000029		0.000076
1,2,3,7,8-PeCDF	0.0000055		< 0.0000049			< 0.0000014			0.000035		< 0.000018
2,3,4,6,7,8-HxCDF	0.000012		0.00031			< 0.0000014			0.00018		0.00042

Table A2
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chemical.name	SED24 SED2401 6/22/2006 0-1	SED24 SED2403 6/22/2006 2-3	SED25 SED2501 6/22/2006 0-1	SED25 SED2503 6/22/2006 2.5-3	SED25 SED2507 6/23/2006 6-7	SED26 SED2601 6/22/2006 0-1	SED26 SED2602 6/22/2006 1.5-2	SED26 SED2605 6/22/2006 4-5	SED27 SED2701 6/22/2006 0-1	SED27 SED2703 6/22/2006 2.5-3	SED28 SED2801 6/21/2006 0.5-1
2,3,4,7,8-PeCDF	0.000095		0.0022			0.0000017			0.00091		0.0031
2,3,7,8-TCDD	0.00000072		0.000018			< 0.00000028			0.0000081		0.000022
2,3,7,8-TCDF	< 0.00000026		0.000053			0.0000016			< 0.0000042		0.000084
OCDD	0.00017		0.0019			0.000043			0.00083		0.0029
OCDF	0.000017		0.00017			0.0000062			0.00013		0.00021
TOTAL HpCDD	0.000058		0.00065			0.000033			0.00038		0.001
TOTAL HpCDF	0.000066		0.0011			0.0000059			0.00051		0.0016
TOTAL HxCDD	0.00005		0.0011			0.000064			0.00045		0.0014
TOTAL HxCDF	0.00049		0.012			0.0000054			0.0048		0.01
TOTAL PeCDD	0.000029		0.00091			0.000022			0.00024		0.00095
TOTAL PeCDF	0.0011		0.012			0.0000061			0.0098		0.024
TOTAL TCDD	0.000017		0.0005			0.000021			0.00013		0.00042
TOTAL TCDF	0.00032		0.0069			0.000021			0.003		0.0088

< - Compound not detected.
Value is detection limit.
mg/kg - milligrams per kilogram

Table A2
Sediment Data (0-7 ft)
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chemical.name	SED28 SED2803 6/21/2006 2.5-3	SED29 SED2901 6/21/2006 0.5-1	SED29 SED2904 6/21/2006 3-4	SED30 SED3001 6/21/2006 0.5-1	SED30 SED3004 6/21/2006 3.6-4	SED31 SED3101 6/21/2006 0.5-1	SED31 SED3104 6/21/2006 3-3.6	SED32 SED3201 6/21/2006 0.5-1	SED32 SED3204 6/21/2006 3.5-4
Volatile Organics (mg/kg)									
1,1,1,2-Tetrachloroethane	< 0.0758	< 0.025	< 0.98	< 0.0043	< 0.0111	< 0.0289	< 0.0051	< 0.005	< 0.0061
1,1,1-Trichloroethane	< 0.0758	< 0.025	< 0.49	< 0.0043	< 0.0111	< 0.0289	< 0.0051	< 0.005	< 0.0061
1,1,2,2-Tetrachloroethane	< 0.0758	< 0.025	< 0.49	< 0.0043	< 0.0111	< 0.0289	< 0.0051	< 0.005	< 0.0061
1,1,2-Trichloroethane	< 0.0758	< 0.025	< 0.49	< 0.0043	< 0.0111	< 0.0289	< 0.0051	< 0.005	< 0.0061
1,1-Dichloroethane	< 0.0758	< 0.025	< 0.49	< 0.0043	0.0285	1.92	< 0.0051	< 0.005	< 0.0061
1,1-Dichloroethene	< 0.0758	< 0.025	< 0.49	< 0.0043	< 0.0111	< 0.0289	< 0.0051	< 0.005	< 0.0061
1,1-Dichloropropene	< 0.0758	< 0.025	< 0.49	< 0.0043	< 0.0111	< 0.0289	< 0.0051	< 0.005	< 0.0061
1,2,3-Trichlorobenzene	< 0.0758	< 0.025	< 0.49	< 0.0043	< 0.0111	< 0.0289	< 0.0051	< 0.005	< 0.0061
1,2,3-Trichloropropane	< 0.0758	< 0.025	< 0.49	< 0.0043	< 0.0111	< 0.0289	< 0.0051	< 0.005	< 0.0061
1,2,4-Trichlorobenzene	< 0.0758	< 0.025	< 0.49	< 0.0043	< 0.0111	< 0.0289	< 0.0051	< 0.005	< 0.0061
1,2,4-Trimethylbenzene	< 0.0758	< 0.025	< 0.49	< 0.0043	< 0.0111	< 0.0289	< 0.0051	< 0.005	< 0.0061
1,2-Dibromo-3-Chloropropane	< 0.0758	< 0.025	< 2.45	< 0.0043	< 0.0111	< 0.0289	< 0.0051	< 0.005	< 0.0061
1,2-Dibromoethane	< 0.0758	< 0.025	< 0.49	< 0.0043	< 0.0111	< 0.0289	< 0.0051	< 0.005	< 0.0061
1,2-Dichlorobenzene	< 0.0758	< 0.025	< 0.49	< 0.0043	< 0.0111	< 0.0289	< 0.0051	< 0.005	< 0.0061
1,2-Dichloroethane	< 0.0758	< 0.025	< 0.49	< 0.0043	< 0.0111	< 0.0289	< 0.0051	< 0.005	< 0.0061
1,2-Dichloropropane	< 0.0758	< 0.025	< 0.49	< 0.0043	< 0.0111	< 0.0289	< 0.0051	< 0.005	< 0.0061
1,3,5-Trimethylbenzene	< 0.0758	< 0.025	< 0.49	< 0.0043	< 0.0111	< 0.0289	< 0.0051	< 0.005	< 0.0061
1,3-Dichlorobenzene	< 0.0758	< 0.025	< 0.49	< 0.0043	< 0.0111	< 0.0289	< 0.0051	< 0.005	< 0.0061
1,3-Dichloropropane	< 0.0758	< 0.025	< 0.49	< 0.0043	< 0.0111	< 0.0289	< 0.0051	< 0.005	< 0.0061
1,4-Dichlorobenzene	< 0.0758	< 0.025	< 0.49	< 0.0043	< 0.0111	< 0.0289	< 0.0051	< 0.005	< 0.0061
1,4-Dioxane	< 3.79	< 1.25	< 49	< 0.217	< 0.554	< 1.45	< 0.253	< 0.248	< 0.306
1-Chlorohexane	< 0.0758	< 0.025	< 0.49	< 0.0043	< 0.0111	< 0.0289	< 0.0051	< 0.005	< 0.0061
2,2-Dichloropropane	< 0.0758	< 0.025	< 0.98	< 0.0043	< 0.0111	< 0.0289	< 0.0051	< 0.005	< 0.0061
2-Butanone	< 0.758	< 0.25	< 12.2	< 0.0434	< 0.111	< 0.289	< 0.0505	< 0.0496	< 0.0613
2-Chlorotoluene	< 0.0758	< 0.025	< 0.49	< 0.0043	< 0.0111	< 0.0289	< 0.0051	< 0.005	< 0.0061
2-Hexanone	< 0.758	< 0.25	< 4.9	< 0.0434	< 0.111	< 0.289	< 0.0505	< 0.0496	< 0.0613
4-Chlorotoluene	< 0.0758	< 0.025	< 0.49	< 0.0043	< 0.0111	< 0.0289	< 0.0051	< 0.005	< 0.0061
4-Methyl-2-Pentanone	< 0.758	< 0.25	< 4.9	< 0.0434	< 0.111	< 0.289	< 0.0505	< 0.0496	< 0.0613
Acetone	1.57	0.27	< 12.2	< 0.0434	0.147	0.522	< 0.0505	< 0.0496	< 0.0613
Acrylonitrile									
Benzene	< 0.0758	< 0.025	< 0.49	< 0.0043	< 0.0111	< 0.0289	< 0.0051	< 0.005	< 0.0061
Bromobenzene	< 0.0758	< 0.025	< 0.49	< 0.0043	< 0.0111	< 0.0289	< 0.0051	< 0.005	< 0.0061
Bromochloromethane	< 0.0758	< 0.025	< 0.49	< 0.0043	< 0.0111	< 0.0289	< 0.0051	< 0.005	< 0.0061
Bromodichloromethane	< 0.0758	< 0.025	< 0.49	< 0.0043	< 0.0111	< 0.0289	< 0.0051	< 0.005	< 0.0061
Bromoform	< 0.0758	< 0.025	< 0.49	< 0.0043	< 0.0111	< 0.0289	< 0.0051	< 0.005	< 0.0061
Bromomethane	< 0.152	< 0.05	< 0.98	< 0.0087	< 0.0222	< 0.0579	< 0.0101	< 0.0099	< 0.0123
Carbon Disulfide	< 0.0758	< 0.025	< 0.49	< 0.0043	< 0.0111	< 0.0289	< 0.0051	< 0.005	< 0.0061
Carbon tetrachloride	< 0.0758	< 0.025	< 0.49	< 0.0043	< 0.0111	< 0.0289	< 0.0051	< 0.005	< 0.0061
Chlorobenzene	< 0.0758	< 0.025	< 0.49	< 0.0043	< 0.0111	< 0.0289	< 0.0051	< 0.005	< 0.0061
Chloroethane	< 0.152	< 0.05	< 0.98	< 0.0087	< 0.0222	< 0.0579	< 0.0101	< 0.0099	< 0.0123
Chloroform	< 0.0758	< 0.025	< 0.49	< 0.0043	< 0.0111	< 0.0289	< 0.0051	< 0.005	< 0.0061

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Sediment Data (0-7 ft)
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chemical.name	SED28 SED2803 6/21/2006 2.5-3	SED29 SED2901 6/21/2006 0.5-1	SED29 SED2904 6/21/2006 3-4	SED30 SED3001 6/21/2006 0.5-1	SED30 SED3004 6/21/2006 3.6-4	SED31 SED3101 6/21/2006 0.5-1	SED31 SED3104 6/21/2006 3-3.6	SED32 SED3201 6/21/2006 0.5-1	SED32 SED3204 6/21/2006 3.5-4
Chloromethane	< 0.152	< 0.05	< 0.98	< 0.0087	< 0.0222	< 0.0579	< 0.0101	< 0.0099	< 0.0123
cis-1,2-Dichloroethene	< 0.0758	< 0.025	< 0.49	< 0.0043	< 0.0111	10.6	< 0.0051	< 0.005	0.0137
cis-1,3-Dichloropropene	< 0.0758	< 0.025	< 0.49	< 0.0043	< 0.0111	< 0.0289	< 0.0051	< 0.005	< 0.0061
Dibromochloromethane	< 0.0758	< 0.025	< 0.49	< 0.0043	< 0.0111	< 0.0289	< 0.0051	< 0.005	< 0.0061
Dibromomethane	< 0.0758	< 0.025	< 0.49	< 0.0043	< 0.0111	< 0.0289	< 0.0051	< 0.005	< 0.0061
Dichlorodifluoromethane	< 0.152	< 0.05	< 0.49	< 0.0087	< 0.0222	< 0.0579	< 0.0101	< 0.0099	< 0.0123
Diethyl ether	< 0.0758	< 0.025	< 0.49	< 0.0043	< 0.0111	< 0.0289	< 0.0051	< 0.005	< 0.0061
Diisopropyl ether	< 0.0758	< 0.025	< 0.49	< 0.0043	< 0.0111	< 0.0289	< 0.0051	< 0.005	< 0.0061
Ethyl tertiary-butyl ether	< 0.0758	< 0.025	< 0.49	< 0.0043	< 0.0111	< 0.0289	< 0.0051	< 0.005	< 0.0061
Ethylbenzene	< 0.0758	< 0.025	< 0.49	< 0.0043	< 0.0111	< 0.0289	< 0.0051	< 0.005	< 0.0061
Hexachlorobutadiene	< 0.0758	< 0.025	< 0.49	< 0.0043	< 0.0111	< 0.0289	< 0.0051	< 0.005	< 0.0061
Isopropyl Benzene	0.332	< 0.025	< 0.49	< 0.0043	< 0.0111	< 0.0289	< 0.0051	< 0.005	< 0.0061
m,p-Xylene	< 0.152	< 0.05	< 0.98	< 0.0087	< 0.0222	< 0.0579	< 0.0101	< 0.0099	< 0.0123
Methylene Chloride	< 0.379	< 0.125	< 2.45	< 0.0217	< 0.0554	< 0.145	< 0.0253	< 0.0248	< 0.0306
Methyl-t-butyl ether	< 0.0758	< 0.025	< 0.49	< 0.0043	< 0.0111	< 0.0289	< 0.0051	< 0.005	< 0.0061
Naphthalene	< 0.0758	< 0.025	< 0.49	< 0.0043	< 0.0111	< 0.0289	< 0.0051	< 0.005	< 0.0061
n-Butylbenzene	< 0.0758	< 0.025	< 0.49	< 0.0043	< 0.0111	< 0.0289	< 0.0051	< 0.005	< 0.0061
n-Propyl Benzene	0.0955	< 0.025	< 0.49	< 0.0043	< 0.0111	< 0.0289	< 0.0051	< 0.005	< 0.0061
o-Xylene	< 0.0758	< 0.025	< 0.49	< 0.0043	< 0.0111	< 0.0289	< 0.0051	< 0.005	< 0.0061
p-Isopropyl Toluene	< 0.0758	< 0.025	< 0.49	< 0.0043	< 0.0111	< 0.0289	< 0.0051	< 0.005	< 0.0061
s-Butylbenzene	0.173	< 0.025	< 0.49	< 0.0043	< 0.0111	< 0.0289	< 0.0051	< 0.005	< 0.0061
Styrene	< 0.0758	< 0.025	< 0.49	< 0.0043	< 0.0111	< 0.0289	< 0.0051	< 0.005	< 0.0061
t-Butylbenzene	< 0.0758	< 0.025	< 0.49	< 0.0043	< 0.0111	< 0.0289	< 0.0051	< 0.005	< 0.0061
Tertiary-amyl methyl ether	< 0.0758	< 0.025	< 0.49	< 0.0043	< 0.0111	< 0.0289	< 0.0051	< 0.005	< 0.0061
Tetrachloroethene	< 0.0758	< 0.025	< 0.49	< 0.0043	< 0.0111	< 0.0289	< 0.0051	< 0.005	< 0.0061
Tetrahydrofuran	< 0.0758	< 0.025	< 2.45	< 0.0043	< 0.0111	< 0.0289	< 0.0051	< 0.005	< 0.0061
Toluene	< 0.0758	< 0.025	< 0.49	< 0.0043	< 0.0111	1.92	< 0.0051	< 0.005	< 0.0061
trans-1,2-Dichloroethene	< 0.0758	< 0.025	< 0.49	< 0.0043	< 0.0111	< 0.0289	< 0.0051	< 0.005	< 0.0061
trans-1,3-Dichloropropene	< 0.0758	< 0.025	< 0.49	< 0.0043	< 0.0111	< 0.0289	< 0.0051	< 0.005	< 0.0061
Trichloroethene	< 0.0758	< 0.025	< 0.49	< 0.0043	< 0.0111	0.797	< 0.0051	< 0.005	0.0073
Trichlorofluoromethane	< 0.0758	< 0.025	< 0.49	< 0.0043	< 0.0111	< 0.0289	< 0.0051	< 0.005	< 0.0061
Vinyl acetate			< 2.45			< 2.85			
Vinyl Chloride	< 0.152	< 0.05	< 0.49	< 0.0087	0.224	11.7	< 0.0101	< 0.0099	< 0.0123
Xylenes, Total	< 0.228	< 0.075	< 1.47	< 0.013	< 0.0333	< 0.0868	< 0.0152	< 0.0149	< 0.0184
Semivolatile Organics (mg/kg)									
1,2,4-Trichlorobenzene									
1,2-Dichlorobenzene									
1,3-Dichlorobenzene									
1,4-Dichlorobenzene									
1-Methylnaphthalene	< 0.232	< 0.101	< 0.0957	< 0.0311	< 0.0507	< 0.109	< 0.0335	< 0.034	< 0.0309
2,4,5-Trichlorophenol									
2,4,6-Trichlorophenol									

Table A2
Sediment Data (0-7 ft)
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Providence, Rhode Island

chemical.name	SED28 SED2803 6/21/2006 2.5-3	SED29 SED2901 6/21/2006 0.5-1	SED29 SED2904 6/21/2006 3-4	SED30 SED3001 6/21/2006 0.5-1	SED30 SED3004 6/21/2006 3.6-4	SED31 SED3101 6/21/2006 0.5-1	SED31 SED3104 6/21/2006 3-3.6	SED32 SED3201 6/21/2006 0.5-1	SED32 SED3204 6/21/2006 3.5-4
2,4-Dichlorophenol									
2,4-Dimethylphenol									
2,4-Dinitrophenol									
2,4-Dinitrotoluene									
2,6-Dinitrotoluene									
2-Chloronaphthalene									
2-Chlorophenol									
2-Methylnaphthalene	< 0.232	< 0.101	< 0.0957	< 0.0311	< 0.0507	< 0.109	< 0.0335	< 0.034	< 0.0309
2-Methylphenol (o-Cresol)									
2-Nitroaniline									
2-Nitrophenol									
3&4-Methylphenol									
3,3'-Dichlorobenzidine									
3-Nitroaniline									
4,6-Dinitro-2-methylphenol									
4-Bromophenyl-phenylether									
4-Chloro-3-methylphenol									
4-Chloroaniline									
4-Chlorophenyl-phenylether									
4-Nitroaniline									
4-Nitrophenol									
Acenaphthene	< 0.232	< 0.101	< 0.0957	< 0.0311	< 0.0507	< 0.109	< 0.0335	0.12	< 0.0309
Acenaphthylene	< 0.232	< 0.101	< 0.0957	< 0.0311	< 0.0507	< 0.109	< 0.0335	< 0.034	< 0.0309
Aniline									
Anthracene	< 0.232	0.169	< 0.0957	0.0852	< 0.0507	0.171	< 0.0335	0.438	< 0.0309
Azobenzene									
Benzo(a)anthracene	< 0.232	0.687	< 0.0957	0.376	< 0.0507	0.671	< 0.0335	0.64	< 0.0309
Benzo(a)pyrene	< 0.232	0.543	< 0.0957	0.239	< 0.0507	0.503	< 0.0335	0.497	< 0.0309
Benzo(b)fluoranthene	< 0.232	0.882	< 0.0957	0.433	0.0527	1.18	< 0.0335	0.892	< 0.0309
Benzo(g,h,i)perylene	< 0.232	0.117	< 0.0957	0.152	< 0.0507	0.124	< 0.0335	0.191	< 0.0309
Benzo(k)fluoranthene	< 0.232	0.396	< 0.0957	0.137	< 0.0507	0.326	< 0.0335	0.43	< 0.0309
Benzoic acid									
Benzyl alcohol									
Bis(2-chloroethoxy)methane									
Bis(2-chloroethyl)ether									
Bis(2-chloroisopropyl)ether									
bis(2-Ethylhexyl)phthalate									
Butylbenzylphthalate									
Chrysene	< 0.232	0.617	< 0.0957	0.299	< 0.0507	0.579	< 0.0335	0.551	< 0.0309
Dibenzo(a,h)anthracene	< 0.232	< 0.101	< 0.0957	0.0404	< 0.0507	< 0.109	< 0.0335	0.0667	< 0.0309
Dibenzofuran									
Diethylphthalate									

Table A2
Sediment Data (0-7 ft)
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Former Gorham Manufacturing Site
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chemical.name	SED28 SED2803 6/21/2006 2.5-3	SED29 SED2901 6/21/2006 0.5-1	SED29 SED2904 6/21/2006 3-4	SED30 SED3001 6/21/2006 0.5-1	SED30 SED3004 6/21/2006 3.6-4	SED31 SED3101 6/21/2006 0.5-1	SED31 SED3104 6/21/2006 3-3.6	SED32 SED3201 6/21/2006 0.5-1	SED32 SED3204 6/21/2006 3.5-4
Dimethylphthalate									
Di-n-butylphthalate									
Di-n-octylphthalate									
Fluoranthene	< 0.232	1.34	< 0.0957	0.535	0.0821	1.51	< 0.0335	1.56	< 0.0309
Fluorene	< 0.232	< 0.101	< 0.0957	0.0802	< 0.0507	< 0.109	< 0.0335	0.156	< 0.0309
Hexachlorobenzene									
Hexachlorobutadiene									
Hexachlorocyclopentadiene									
Hexachloroethane									
Indeno(1,2,3-cd)pyrene	< 0.232	0.125	< 0.0957	0.124	< 0.0507	0.128	< 0.0335	0.207	< 0.0309
Isophorone									
Naphthalene	< 0.232	< 0.101	< 0.0957	0.0342	< 0.0507	< 0.109	< 0.0335	0.0456	< 0.0309
Nitrobenzene									
N-Nitrosodimethylamine									
N-Nitroso-di-n-propylamine									
N-Nitrosodiphenylamine									
Pentachlorophenol									
Phenanthrene	< 0.232	0.689	< 0.0957	0.466	< 0.0507	0.757	< 0.0335	1.23	< 0.0309
Phenol									
Pyrene	< 0.232	0.874	< 0.0957	0.81	0.0659	0.953	< 0.0335	1.07	< 0.0309
Pesticides/PCBs (mg/kg)									
4,4'-DDD		< 0.0211		< 0.00635		< 0.0207		0.0301	
4,4'-DDE		< 0.0211		< 0.00635		< 0.0207		0.0109	
4,4'-DDT		< 0.0211		< 0.00635		< 0.0207		0.0635	
Aldrin		< 0.0211		< 0.00635		< 0.0207		< 0.00678	
alpha-BHC		< 0.0211		< 0.00635		< 0.0207		< 0.00678	
alpha-Chlordane		< 0.0211		< 0.00635		< 0.0207		< 0.00678	
Aroclor-1016		< 0.21		< 0.0634		< 0.207		< 0.0677	
Aroclor-1221		< 0.21		< 0.0634		< 0.207		< 0.0677	
Aroclor-1232		< 0.21		< 0.0634		< 0.207		< 0.0677	
Aroclor-1242		< 0.21		< 0.0634		< 0.207		< 0.0677	
Aroclor-1248		< 0.21		< 0.0634		< 0.207		< 0.0677	
Aroclor-1254		< 0.21		0.528		< 0.207		< 0.0677	
Aroclor-1260		< 0.21		< 0.0634		< 0.207		< 0.0677	
Aroclor-1262		< 0.21		< 0.0634		< 0.207		< 0.0677	
Aroclor-1268		< 0.21		< 0.0634		< 0.207		< 0.0677	
beta-BHC		< 0.0211		< 0.00635		< 0.0207		< 0.00678	
Chlordane		< 0.211		< 0.0635		< 0.207		< 0.0678	
delta-BHC		< 0.0211		< 0.00635		< 0.0207		< 0.00678	
Dieldrin		< 0.0211		< 0.00635		< 0.0207		< 0.00678	
Endosulfan I		< 0.0211		< 0.00635		< 0.0207		< 0.00678	
Endosulfan II		< 0.0211		< 0.00635		< 0.0207		< 0.00678	

Table A2
Sediment Data (0-7 ft)
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chemical.name	SED28 SED2803 6/21/2006 2.5-3	SED29 SED2901 6/21/2006 0.5-1	SED29 SED2904 6/21/2006 3-4	SED30 SED3001 6/21/2006 0.5-1	SED30 SED3004 6/21/2006 3.6-4	SED31 SED3101 6/21/2006 0.5-1	SED31 SED3104 6/21/2006 3-3.6	SED32 SED3201 6/21/2006 0.5-1	SED32 SED3204 6/21/2006 3.5-4
Endosulfan sulfate		< 0.0211		< 0.00635		< 0.0207		< 0.00678	
Endrin		< 0.0211		< 0.00635		< 0.0207		< 0.00678	
Endrin aldehyde		< 0.0211		< 0.00635		< 0.0207		< 0.00678	
Endrin ketone		< 0.0211		< 0.00635		< 0.0207		< 0.00678	
gamma-BHC (Lindane)		< 0.0211		< 0.00635		< 0.0207		< 0.00678	
gamma-Chlordane		< 0.0211		< 0.00635		< 0.0207		< 0.00678	
Heptachlor		< 0.0211		< 0.00635		< 0.0207		< 0.00678	
Heptachlor epoxide		< 0.0211		< 0.00635		< 0.0207		< 0.00678	
Hexachlorobenzene		< 0.0211		< 0.00635		< 0.0207		< 0.00678	
Methoxychlor		< 0.0211		< 0.00635		< 0.0207		< 0.00678	
Toxaphene		< 1.05		< 0.317		< 1.04		< 0.339	
Antimony	< 50.8	< 20.4	< 21.7	< 7	< 11.8	< 21.3	< 7.2	< 7.4	< 7.1
Arsenic	51.4	31.7	24.7	2.2	< 3	14.8	< 1.8	< 1.8	5.6
Barium	115	372	13.5	25.1	10.2	113	6.1	13.4	11.1
Beryllium	0.81	0.65	< 0.22	0.11	< 0.12	0.61	< 0.07	0.1	0.2
Cadmium	< 5.08	6.44	< 2.17	0.75	< 1.18	4.13	< 0.72	0.93	< 0.71
Chromium	19.6	252	14.7	172	10.3	449	3.2	28.9	7.1
Copper	48.4	1260	57.9	1320	33.6	1790	2.8	2670	8.5
Lead	101	772	< 21.7	159	23	1120	< 7.2	304	< 7.1
Mercury	< 0.284	1.53	< 0.115	0.113	< 0.07	1.11	< 0.044	0.061	< 0.037
Nickel	< 25.4	147	35.1	19.2	7.2	99.8	< 3.6	22.8	4.3
Selenium	< 50.8	< 20.4	< 21.7	< 7	< 11.8	< 21.3	< 7.2	< 7.4	< 7.1
Silver	< 5.08	130	< 2.17	38.4	3.34	131	< 0.72	30.3	< 0.71
Thallium	< 12.7	< 5.1	< 5.4	< 1.7	< 3	< 5.3	< 1.8	< 1.8	< 1.8
Zinc	45.5	1480	54.8	893	43.3	1440	5.8	1110	19.5
Total Cyanide									
Total Organic Carbon (TOC)		45000		6700		46000		7000	
TPH (mg/kg)									
Total Petroleum Hydrocarbons (TPH)		459		1240		961		209	
Dioxins/Furans (mg/kg)									
1,2,3,4,6,7,8-HpCDD		0.00018		0.000066		0.00043		0.000074	
1,2,3,4,6,7,8-HpCDF		0.00035		0.000036		0.00071		0.00004	
1,2,3,4,7,8,9-HpCDF		0.000069		0.0000061		0.00017		0.0000051	
1,2,3,4,7,8-HxCDD		0.000018		0.0000034		0.000055		0.0000018	
1,2,3,4,7,8-HxCDF		0.00021		0.000018		0.00032		0.000011	
1,2,3,6,7,8-HxCDD		0.00007		0.000012		0.00015		0.0000048	
1,2,3,6,7,8-HxCDF		0.00029		0.000014		0.00075		0.000012	
1,2,3,7,8,9-HxCDD		0.000031		0.0000072		0.000078		0.0000028	
1,2,3,7,8,9-HxCDF		0.00014		0.0000096		0.00042		0.0000053	
1,2,3,7,8-PeCDD		0.000041		0.0000052		0.00012		0.0000022	
1,2,3,7,8-PeCDF		< 0.0000018		< 0.0000007		0.00023		< 0.00000073	
2,3,4,6,7,8-HxCDF		0.00023		0.000013		0.00064		0.000012	

Table A2
Sediment Data (0-7 ft)
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Providence, Rhode Island

chemical.name	SED28 SED2803 6/21/2006 2.5-3	SED29 SED2901 6/21/2006 0.5-1	SED29 SED2904 6/21/2006 3-4	SED30 SED3001 6/21/2006 0.5-1	SED30 SED3004 6/21/2006 3.6-4	SED31 SED3101 6/21/2006 0.5-1	SED31 SED3104 6/21/2006 3-3.6	SED32 SED3201 6/21/2006 0.5-1	SED32 SED3204 6/21/2006 3.5-4
2,3,4,7,8-PeCDF		0.00016		0.000076		0.0016		0.000028	
2,3,7,8-TCDD		0.000012		0.00000062		0.000033		0.00000052	
2,3,7,8-TCDF		0.000032		0.0000047		0.000076		0.000006	
OCDD		0.00084		0.00054		0.0016		0.00081	
OCDF		0.00017		0.000037		0.00019		0.00008	
TOTAL HpCDD		0.0004		0.00013		0.00094		0.00017	
TOTAL HpCDF		0.00087		0.000094		0.002		0.00012	
TOTAL HxCDD		0.0009		0.00013		0.002		0.000051	
TOTAL HxCDF		0.0083		0.00038		0.025		0.00032	
TOTAL PeCDD		0.00053		0.000055		0.0016		0.000025	
TOTAL PeCDF		0.014		0.00059		0.04		0.0005	
TOTAL TCDD		0.00027		0.000021		0.00064		0.000012	
TOTAL TCDF		0.0037		0.00017		0.015		0.00016	

< - Compound not detected.
Value is detection limit.
mg/kg - milligrams per kilogram

Prepared by: BJR
Checked by: KJC

APPENDIX B

Dose-Response Information and Toxicity Data

TABLE B1

CANCER TOXICITY DATA -- ORAL/DERMAL

SUPPLEMENTAL SITE INVESTIGATION REPORT

FORMER GORHAM MANUFACTURING SITE

333 ADELAIDE AVENUE

PROVIDENCE, RHODE ISLAND

Chemical of Potential Concern	Oral Cancer Slope Factor		Oral Absorption Efficiency for Dermal (1)	Absorbed Cancer Slope Factor for Dermal (2)		Weight of Evidence/ Cancer Guideline Description	Oral Cancer Slope Factor	
	Value	Units		Value	Units		Source(s)	Date(s)
BASE NEUTRAL COMPOUNDS								
Benzo(a)anthracene	7.3E-01	(mg/kg/day) $^{-1}$	89%	7.3E-01	(mg/kg/day) $^{-1}$	B2	NCEA	April, 2006
Benzo(a)pyrene	7.3E+00	(mg/kg/day) $^{-1}$	89%	7.3E+00	(mg/kg/day) $^{-1}$	B2	IRIS	July, 2006
Benzo(b)fluoranthene	7.3E-01	(mg/kg/day) $^{-1}$	89%	7.3E-01	(mg/kg/day) $^{-1}$	B2	NCEA	April, 2006
Dibenzo(a,h)anthracene	7.3E+00	(mg/kg/day) $^{-1}$	89%	7.3E+00	(mg/kg/day) $^{-1}$	B2	NCEA	April, 2006
Indeno(1,2,3-cd)pyrene	7.3E-01	(mg/kg/day) $^{-1}$	89%	7.3E-01	(mg/kg/day) $^{-1}$	B2	NCEA	April, 2006
INORGANICS/METALS								
Arsenic	1.5E+00	(mg/kg/day) $^{-1}$	95%	1.5E+00	(mg/kg/day) $^{-1}$	A	IRIS	July, 2006
Cadmium	ND			ND		ND	IRIS	July, 2006
Chromium VI	NA			NA		Cannot be determined	IRIS	July, 2006
Copper	NA			NA		D	IRIS	July, 2006
Lead	NA			NA		B2	IRIS	July, 2006
Mercury (as elemental mercury)	NA			NA		D	IRIS	July, 2006
Nickel	ND			ND		ND	IRIS	July, 2006
Silver	NA			NA		D	IRIS	July, 2006
PESTICIDES/PCBs								
Aroclor-1254	2.0E+00	(mg/kg/day) $^{-1}$	80%	2.0E+00	(mg/kg/day) $^{-1}$	See PCBs		
DIOXINS/FURANS								
2,3,7,8-tetrachlorobenzo-p-dioxin (TCDD)	1.5E+05	(mg/kg/day) $^{-1}$	70%	1.5E+05	(mg/kg/day) $^{-1}$	B2	HEAST	Y 1997 / April, 200
VOLATILES								
1,2-Dichloroethene (cis)	ND			ND		D	IRIS	July, 2006
Butylbenzene, sec-	ND			ND		ND		
Tetrachloroethene	5.4E-01	(mg/kg/day) $^{-1}$	100%	5.4E-01	(mg/kg/day) $^{-1}$	NA	CALEPA	August, 2005
Trichloroethene	4.0E-01	(mg/kg/day) $^{-1}$	100%	4.0E-01	(mg/kg/day) $^{-1}$	NA	NCEA	April, 2006
Vinyl Chloride (child and adult)	1.4E+00	(mg/kg/day) $^{-1}$	100%	1.4E+00	(mg/kg/day) $^{-1}$	Known carcinogen	IRIS	July, 2006
Vinyl Chloride (adult only)	7.2E-01	(mg/kg/day) $^{-1}$	100%	7.2E-01	(mg/kg/day) $^{-1}$	Known carcinogen	IRIS	July, 2006

TABLE B1

CANCER TOXICITY DATA -- ORAL/DERMAL

SUPPLEMENTAL SITE INVESTIGATION REPORT

FORMER GORHAM MANUFACTURING SITE

333 ADELAIDE AVENUE

PROVIDENCE, RHODE ISLAND

Chemical of Potential Concern	Oral Cancer Slope Factor		Oral Absorption Efficiency for Dermal (1)	Absorbed Cancer Slope Factor for Dermal (2)		Weight of Evidence/ Cancer Guideline Description	Oral Cancer Slope Factor	
	Value	Units		Value	Units		Source(s)	Date(s)

Notes:

IRIS = Integrated Risk Information System: July, 2006

PPRTV = Preliminary Peer-Reviewed Reference Toxicity Value April, 2006

HEAST= Health Effects Assessment Summary Tables: FY 1997 / April, 2006

NCEA = National Center for Environmental Assessment: April, 2006 April, 2006

NCEA provisional values are obtained from the USEPA Region III RBC Table dated:

CALEPA - California Environmental Protection Agency August, 2005

ND = no data available

(1) Values obtained from RAGS Volume 1 (Part E, Supplemental Guidance for Dermal Risk Assessment, Interim Guidance) (EPA, 2004)
Per this guidance, a value of 100% is used for analytes without published values.

(2) Adjusted Dermal SF = Oral SF / Oral to Dermal Adjustment Factor. Per RAGS Part E (USEPA, 2004), adjustments are only performed for chemicals that have an oral absorption efficiency of less than 50%.

Values for 2,4- and 2,6-dinitrotoluene based on IRIS for 2,4/2,6-Dinitrotoluene mixture

The value for chlordane is used as surrogate for the isomers.

Slope Factor for Benzo(a)Pyrene used for other carcinogenic PAHs, adjusted by Relative Potency Factors of 1.0 [benzo(a)pyrene, dibenz(a,h)anthracene]; 0.1 [benzo(a)anthracene, benzo(b)flouoranthene, indeno(1,2,3-c,d)pyrene]; 0.01 [benzo(k)fluoranthene]; 0.001 [chrysene].

PCB slope factors are applicable to Aroclors 1016, 1248, 1254, and 1260.

[a] - The RfD for chloroform is protective for cancer risk.

Weight of Evidence:

A - Human carcinogen

B1 - Probable human carcinogen - indicates that limited human data a

B2 - Probable human carcinogen - indicates sufficient evidence in ani inadequate or no evidence in humans

C - Possible human carcinogen

D - Not classifiable as a human carcinogen

E - Evidence of noncarcinogenicity

mg = milligram

kg = kilogram

BW = body weight

Checked by: JHP 7/2006

TABLE B2
NON-CANCER TOXICITY DATA -- ORAL/DERMAL
SUPPLEMENTAL SITE INVESTIGATION REPORT
FORMER GORHAM MANUFACTURING SITE
333 ADELAIDE AVENUE
PROVIDENCE, RHODE ISLAND

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD		Oral Absorption Efficiency for Dermal (1)	Adjusted Dermal RfD (2)		Primary Target Organ or System / Critical Effect	Combined Uncertainty/Modifying Factors	RfD: Target Organ(s)	
		Value	Units		Value	Units			Source(s)	Date(s)
BASE NEUTRAL COMPOUNDS										
Benzo(a)anthracene	chronic	3.0E-02	mg/kg/day	89%	3.0E-02	mg/kg/day	Kidney/Renal tubluar pathology	3,000/1	Surrogate (2)	
	subchronic	3.0E-01	mg/kg/day	89%	3.0E-01	mg/kg/day	Kidney/Renal tubluar pathology	300/1	Surrogate (2)	
Benzo(a)pyrene	chronic	3.0E-02	mg/kg/day	89%	3.0E-02	mg/kg/day	Kidney/Renal tubluar pathology	3,000/1	Surrogate (2)	
	subchronic	3.0E-01	mg/kg/day	89%	3.0E-01	mg/kg/day	Kidney/Renal tubluar pathology	300/1	Surrogate (2)	
Benzo(b)fluoranthene	chronic	3.0E-02	mg/kg/day	89%	3.0E-02	mg/kg/day	Kidney/Renal tubluar pathology	3,000/1	Surrogate (2)	
	subchronic	3.0E-01	mg/kg/day	89%	3.0E-01	mg/kg/day	Kidney/Renal tubluar pathology	300/1	Surrogate (2)	
Dibenzo(a,h)anthracene	chronic	3.0E-02	mg/kg/day	89%	3.0E-02	mg/kg/day	Kidney/Renal tubluar pathology	3,000/1	Surrogate (2)	
	subchronic	3.0E-01	mg/kg/day	89%	3.0E-01	mg/kg/day	Kidney/Renal tubluar pathology	300/1	Surrogate (2)	
Indeno(1,2,3-cd)pyrene	chronic	3.0E-02	mg/kg/day	89%	3.0E-02	mg/kg/day	Kidney/Renal tubluar pathology	3,000/1	Surrogate (2)	
	subchronic	3.0E-01	mg/kg/day	89%	3.0E-01	mg/kg/day	Kidney/Renal tubluar pathology	300/1	Surrogate (2)	
INORGANICS/METALS										
Arsenic	chronic	3.0E-04	mg/kg/day	95%	3.0E-04	mg/kg/day	Skin/Keratosis and hyperpigmentation	3/1	IRIS	September, 2004
	subchronic	3.0E-04	mg/kg/day	95%	3.0E-04	mg/kg/day	Skin/Keratosis and hyperpigmentation	3/1	HEAST	FY 1997
Cadmium (water)	chronic	5.0E-04	mg/kg/day	5%	2.5E-05	mg/kg/day	Kidney/Proteinuria	10/1	IRIS	September, 2004
	subchronic	5.0E-04	mg/kg/day	5%	2.5E-05	mg/kg/day	Kidney/Proteinuria	10/1	Chronic	
Chromium VI	chronic	3.0E-03	mg/kg/day	2.5%	7.5E-05	mg/kg/day	No effects observed	300/3	IRIS	September, 2004
	subchronic	2.0E-02	mg/kg/day	2.5%	5.0E-04	mg/kg/day	No effects observed	300/1	HEAST	FY 1997
Copper	chronic	ND			ND				IRIS	September, 2004
	subchronic	ND			ND					
Lead	chronic	ND			ND				IRIS	September, 2004
	subchronic	ND			ND					
Mercury (as mercuric chloride)	chronic	3.0E-04	mg/kg/day	7%	2.1E-05	mg/kg/day	Immune system/Autoimmune effects	1,000/1	IRIS	September, 2004
	subchronic	2.0E-03	mg/kg/day	7%	1.4E-04	mg/kg/day	Kidney	100/1	MRL	January, 2004
Nickel	chronic	2.0E-02	mg/kg/day	4%	8.0E-04	mg/kg/day	Decreased body and organ weights	300/1	IRIS	September, 2004
	subchronic	2.0E-02	mg/kg/day	4%	8.0E-04	mg/kg/day	Decreased body and organ weights	300/1	HEAST	FY 1997
Silver	chronic	5.0E-03	mg/kg/day	4%	2.0E-04	mg/kg/day	Skin, eye, and respiratory tract/Argyria	3/1	IRIS	September, 2004
PESTICIDES/PCBs										
Aroclor-1254	chronic	2.0E-05	mg/kg/day	80%	2.0E-05	mg/kg/day	Immune system/Immunotoxicity	300	IRIS	September, 2004
	subchronic	5.0E-05	mg/kg/day	80%	5.0E-05	mg/kg/day	Immune system/Immunotoxicity	300	HEAST	FY 1997
DIOXINS/FURANS										
2,3,7,8-tetrachlorobenzo-p-dioxin (TCDD)	chronic	ND							IRIS	September, 2004
	subchronic	ND								
VOLATILES										
1,2-Dichloroethene (cis)	chronic	1.0E-02	mg/kg/day	100%	1.0E-02	mg/kg/day	Hematological	3,000	PPRTV	September, 2004
	subchronic	1.0E-01	mg/kg/day	100%	1.0E-01	mg/kg/day	Hematological	300	PPRTV	September, 2004
Butylbenzene, sec-	chronic	1.0E-02	mg/kg/day	100%	1.0E-02	mg/kg/day			NCEA	April, 2004
	subchronic	1.0E-02	mg/kg/day	100%	1.0E-02	mg/kg/day			Chronic	
Tetrachloroethene	chronic	1.0E-02	mg/kg/day	100%	1.0E-02	mg/kg/day	Liver/Hepatotoxicity	1,000	IRIS	September, 2004
	subchronic	1.0E-01	mg/kg/day	100%	1.0E-01	mg/kg/day	Liver/Hepatotoxicity	100	HEAST	FY 1997
Trichloroethene	chronic	3.0E-04	mg/kg/day	100%	3.0E-04	mg/kg/day	Liver and kidney		NCEA	April, 2004
	subchronic	3.0E-04	mg/kg/day	100%	3.0E-04	mg/kg/day	Liver and kidney		Chronic	
Vinyl Chloride	chronic	3.0E-03	mg/kg/day	100%	3.0E-03	mg/kg/day	Liver/Liver cell polymorphism	30	IRIS	September, 2004

TABLE B2
NON-CANCER TOXICITY DATA – ORAL/DERMAL
SUPPLEMENTAL SITE INVESTIGATION REPORT
FORMER GORHAM MANUFACTURING SITE
333 ADELAIDE AVENUE
PROVIDENCE, RHODE ISLAND

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD		Oral Absorption Efficiency for Dermal (1)	Adjusted Dermal RfD (2)		Primary Target Organ or System / Critical Effect	Combined Uncertainty/Modifying Factors	RfD: Target Organ(s)	
		Value	Units		Value	Units			Source(s)	Date(s)

Notes:

IRIS = Integrated Risk Information System: September, 2004
HEAST= Health Effects Assessment Summary Tables: FY 1997
NCEA = National Center for Environmental Assessment: April, 2004
NCEA provisional values are obtained from the USEPA Region III RBC Table datec April, 2004
PPRTV = Peer-Reviewed Reference Toxicity Value: September, 2004
MRL = Minimum Risk Level (ATSDR): January, 2004
ND = no data available

mg = milligram
kg = kilogram
BW = body weight
chronic - the chronic value is used as the subchronic RfD
surrogate - a value for a closely related chemical is used as the RfD

(1) Values obtained from RAGS Volume 1 (Part E, Supplemental Guidance for Dermal Risk Assessment, Interim Guidance) (EPA, 1999)
Per this guidance, a value of 100% is used for analytes without published values.
(2) Adjusted Dermal RfD = Oral RfD x Oral to Dermal Adjustment Factor. Per RAGS Part E (USEPA, 1999), adjustments are only performed for chemicals that have an oral absorption efficiency of less than 50%.

Per USEPA Region I "Risk Updates, No. 5", (August, 1999), Non-carcinogenic PAHs without published RfDs should be evaluated using the published RfD for a structurally similar PAH.
Surrogate (1) - Value for acenaphthene used as a surrogate
Surrogate (2) - Value for pyrene used as a surrogate
RfD for DDT is used as surrogate for DDD and DDE
RfD for Aroclor 1254 used as surrogate for other PCB congeners with no published RfDs
RfD for Endosulfan used as surrogate for other endosulfan compounds
RfD for Endrin used as surrogate for other endrin compounds
For Manganese in drinking water: As recommended by USEPA Region I Risk Update, a non-dietary RfD is obtained by subtracting typical dietary intake of manganese (5 mg/kday) from critical dose (10 mg/day). Non-dietary RfD is then adjusted with a modifying factor of 3, as recommended by IRIS for drinking water exposures.
For manganese in non-drinking water media: As recommended by USEPA Region I Risk Update, a non-dietary RfD is obtained by subtracting typical dietary intake of manganese (5 mg/kday) from critical dose (10 mg/day). A modifying factor of 1 is then applied, per USEPA Region 1.
Value for chlordane used for alpha- and gamma- isomers.

APPENDIX C

Methods for Computing the Exposure Point Concentration Term

Data File	P:\W2-mfg\TEXTRON\GORHAM\Database\P	Variable:	cis-1,2-Dichloroethene N

Raw Statistics	
Number of Valid Samples	12
Number of Unique Samples	7
Minimum	0.0025
Maximum	0.0062
Mean	0.004583
Median	0.0045
Standard Deviation	0.001148
Variance	1.32E-006
Coefficient of Variation	0.25047
Skewness	-0.756479

Gamma Statistics	
k hat	14.44427
k star (bias corrected)	10.88876
Theta hat	0.000317
Theta star	0.000421
nu hat	346.6626
nu star	261.3303
Approx.Chi Square Value (.05)	224.8895
Adjusted Level of Significance	0.02896
Adjusted Chi Square Value	219.7299

Log-transformed Statistics	
Minimum of log data	-5.991465
Maximum of log data	-5.083206
Mean of log data	-5.420344
Standard Deviation of log data	0.291608
Variance of log data	0.085035

RECOMMENDATION
Data are normal (0.05)
Use Student's-t UCL

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.882715
Shapiro-Wilk 5% Critical Value	0.859
Data are normal at 5% significance level	
95% UCL (Assuming Normal Distribution)	
Student's-t UCL	0.005178
Gamma Distribution Test	
A-D Test Statistic	0.908984
A-D 5% Critical Value	0.730993
K-S Test Statistic	0.307039
K-S 5% Critical Value	0.2453
Data do not follow gamma distribution at 5% significance level	
95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	0.005326
Adjusted Gamma UCL	0.005451
Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.807832
Shapiro-Wilk 5% Critical Value	0.859
Data not lognormal at 5% significance level	
95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	0.005467
95% Chebyshev (MVUE) UCL	0.006304
97.5% Chebyshev (MVUE) UCL	0.007041
99% Chebyshev (MVUE) UCL	0.008488
95% Non-parametric UCLs	
CLT UCL	0.005128
Adj-CLT UCL (Adjusted for skewness)	0.005051
Mod-t UCL (Adjusted for skewness)	0.005166
Jackknife UCL	0.005178
Standard Bootstrap UCL	0.005106
Bootstrap-t UCL	0.005098
Hall's Bootstrap UCL	0.005077
Percentile Bootstrap UCL	0.0051
BCA Bootstrap UCL	0.005058
95% Chebyshev (Mean, Sd) UCL	0.006028
97.5% Chebyshev (Mean, Sd) UCL	0.006653
99% Chebyshev (Mean, Sd) UCL	0.007881

Data File	P:\W2-mfg\TEXTRON\GORHAM\Database\P	Variable:	Tetrachloroethene N	

Raw Statistics	
Number of Valid Samples	12
Number of Unique Samples	2
Minimum	0.0005
Maximum	0.0012
Mean	0.000558
Median	0.0005
Standard Deviation	0.000202
Variance	4.08E-008
Coefficient of Variation	0.361921
Skewness	3.464102

Gamma Statistics	
k hat	13.53628
k star (bias corrected)	10.20776
Theta hat	4.12E-005
Theta star	5.47E-005
nu hat	324.8707
nu star	244.9863
Approx.Chi Square Value (.05)	209.7418
Adjusted Level of Significance	0.02896
Adjusted Chi Square Value	204.7648

Log-transformed Statistics	
Minimum of log data	-7.600902
Maximum of log data	-6.725434
Mean of log data	-7.527947
Standard Deviation of log data	0.252726
Variance of log data	0.06387

RECOMMENDATION
Data are Non-parametric (0.05)
Use Student's-t UCL
or Modified-t UCL

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.327007
Shapiro-Wilk 5% Critical Value	0.859
Data not normal at 5% significance level	
95% UCL (Assuming Normal Distribution)	
Student's-t UCL	0.000663

Gamma Distribution Test	
A-D Test Statistic	4.097373
A-D 5% Critical Value	0.730852
K-S Test Statistic	0.537281
K-S 5% Critical Value	0.245316
Data do not follow gamma distribution	
at 5% significance level	
95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	0.000652
Adjusted Gamma UCL	0.000668

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.327007
Shapiro-Wilk 5% Critical Value	0.859
Data not lognormal at 5% significance level	
95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	0.000641
95% Chebyshev (MVUE) UCL	0.000731
97.5% Chebyshev (MVUE) UCL	0.000808
99% Chebyshev (MVUE) UCL	0.000958

95% Non-parametric UCLs	
CLT UCL	0.000654
Adj-CLT UCL (Adjusted for skewness)	0.000717
Mod-t UCL (Adjusted for skewness)	0.000673
Jackknife UCL	0.000663
Standard Bootstrap UCL	N/R
Bootstrap-t UCL	N/R
Hall's Bootstrap UCL	N/A
Percentile Bootstrap UCL	N/R
BCA Bootstrap UCL	N/R
95% Chebyshev (Mean, Sd) UCL	0.000813
97.5% Chebyshev (Mean, Sd) UCL	0.000923
99% Chebyshev (Mean, Sd) UCL	0.001139

Data File	P:\W2-mfg\TEXTRON\GORHAM\Database\F	Variable:	Trichloroethene N	

Raw Statistics	
Number of Valid Samples	12
Number of Unique Samples	9
Minimum	0.0005
Maximum	0.0029
Mean	0.001333
Median	0.00135
Standard Deviation	0.000627
Variance	3.93E-007
Coefficient of Variation	0.470372
Skewness	1.187336

Gamma Statistics	
k hat	4.960468
k star (bias corrected)	3.775907
Theta hat	0.000269
Theta star	0.000353
nu hat	119.0512
nu star	90.62176
Approx.Chi Square Value (.05)	69.66748
Adjusted Level of Significance	0.02896
Adjusted Chi Square Value	66.86894

Log-transformed Statistics	
Minimum of log data	-7.600902
Maximum of log data	-5.843045
Mean of log data	-6.724243
Standard Deviation of log data	0.494126
Variance of log data	0.244161

RECOMMENDATION
Data are normal (0.05)
Use Student's-t UCL

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.882994
Shapiro-Wilk 5% Critical Value	0.859
Data are normal at 5% significance level	
95% UCL (Assuming Normal Distribution)	
Student's-t UCL	0.001658
Gamma Distribution Test	
A-D Test Statistic	0.475079
A-D 5% Critical Value	0.732141
K-S Test Statistic	0.156878
K-S 5% Critical Value	0.245949
Data follow gamma distribution	
at 5% significance level	
95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	0.001734
Adjusted Gamma UCL	0.001807
Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.906582
Shapiro-Wilk 5% Critical Value	0.859
Data are lognormal at 5% significance level	
95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	0.001865
95% Chebyshev (MVUE) UCL	0.002196
97.5% Chebyshev (MVUE) UCL	0.002566
99% Chebyshev (MVUE) UCL	0.003292
95% Non-parametric UCLs	
CLT UCL	0.001631
Adj-CLT UCL (Adjusted for skewness)	0.001697
Mod-t UCL (Adjusted for skewness)	0.001669
Jackknife UCL	0.001658
Standard Bootstrap UCL	0.001621
Bootstrap-t UCL	0.00172
Hall's Bootstrap UCL	0.002096
Percentile Bootstrap UCL	0.001642
BCA Bootstrap UCL	0.001642
95% Chebyshev (Mean, Sd) UCL	0.002122
97.5% Chebyshev (Mean, Sd) UCL	0.002464
99% Chebyshev (Mean, Sd) UCL	0.003135

Data File	P:\W2-mfg\TEXTRON\GORHAM\Database\P	Variable:	Vinyl chloride N	

Raw Statistics	
Number of Valid Samples	12
Number of Unique Samples	8
Minimum	0.0005
Maximum	0.0021
Mean	0.001325
Median	0.0013
Standard Deviation	0.00051
Variance	2.6E-007
Coefficient of Variation	0.385
Skewness	-0.228354

Gamma Statistics	
k hat	5.892077
k star (bias corrected)	4.474613
Theta hat	0.000225
Theta star	0.000296
nu hat	141.4098
nu star	107.3907
Approx.Chi Square Value (.05)	84.46959
Adjusted Level of Significance	0.02896
Adjusted Chi Square Value	81.37169

Log-transformed Statistics	
Minimum of log data	-7.600902
Maximum of log data	-6.165818
Mean of log data	-6.713596
Standard Deviation of log data	0.469946
Variance of log data	0.220849

RECOMMENDATION
Data are normal (0.05)
Use Student's-t UCL

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.944635
Shapiro-Wilk 5% Critical Value	0.859
Data are normal at 5% significance level	
95% UCL (Assuming Normal Distribution)	
Student's-t UCL	0.001589
Gamma Distribution Test	
A-D Test Statistic	0.521811
A-D 5% Critical Value	0.731688
K-S Test Statistic	0.203302
K-S 5% Critical Value	0.245832
Data follow gamma distribution	
at 5% significance level	
95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	0.001685
Adjusted Gamma UCL	0.001749
Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.861871
Shapiro-Wilk 5% Critical Value	0.859
Data are lognormal at 5% significance level	
95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	0.001827
95% Chebyshev (MVUE) UCL	0.002153
97.5% Chebyshev (MVUE) UCL	0.002504
99% Chebyshev (MVUE) UCL	0.003193
95% Non-parametric UCLs	
CLT UCL	0.001567
Adj-CLT UCL (Adjusted for skewness)	0.001557
Mod-t UCL (Adjusted for skewness)	0.001588
Jackknife UCL	0.001589
Standard Bootstrap UCL	0.00156
Bootstrap-t UCL	0.00157
Hall's Bootstrap UCL	0.001558
Percentile Bootstrap UCL	0.00155
BCA Bootstrap UCL	0.001533
95% Chebyshev (Mean, Sd) UCL	0.001967
97.5% Chebyshev (Mean, Sd) UCL	0.002245
99% Chebyshev (Mean, Sd) UCL	0.00279

Data File	P:\W2-mfg\TEXTRON\GORHAM\Database\P	Variable:	Benzo(a)anthracene N

Raw Statistics	
Number of Valid Samples	12
Number of Unique Samples	2
Minimum	0.0001
Maximum	0.0002
Mean	0.000108
Median	0.0001
Standard Deviation	2.89E-005
Variance	8.33E-010
Coefficient of Variation	0.266469
Skewness	3.464102

Gamma Statistics	
k hat	22.60662
k star (bias corrected)	17.01052
Theta hat	4.79E-006
Theta star	6.37E-006
nu hat	542.5589
nu star	408.2525
Approx.Chi Square Value (.05)	362.4063
Adjusted Level of Significance	0.02896
Adjusted Chi Square Value	355.8106

Log-transformed Statistics	
Minimum of log data	-9.21034
Maximum of log data	-8.517193
Mean of log data	-9.152578
Standard Deviation of log data	0.200094
Variance of log data	0.040038

RECOMMENDATION
Data are Non-parametric (0.05)
Use Student's-t UCL
or Modified-t UCL

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.327007
Shapiro-Wilk 5% Critical Value	0.859
Data not normal at 5% significance level	
95% UCL (Assuming Normal Distribution)	
Student's-t UCL	0.000123

Gamma Distribution Test	
A-D Test Statistic	4.092277
A-D 5% Critical Value	0.731666
K-S Test Statistic	0.536456
K-S 5% Critical Value	0.245178
Data do not follow gamma distribution	
at 5% significance level	
95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	0.000122
Adjusted Gamma UCL	0.000124

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.327007
Shapiro-Wilk 5% Critical Value	0.859
Data not lognormal at 5% significance level	
95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	0.000121
95% Chebyshev (MVUE) UCL	0.000135
97.5% Chebyshev (MVUE) UCL	0.000147
99% Chebyshev (MVUE) UCL	0.00017

95% Non-parametric UCLs	
CLT UCL	0.000122
Adj-CLT UCL (Adjusted for skewness)	0.000131
Mod-t UCL (Adjusted for skewness)	0.000125
Jackknife UCL	0.000123
Standard Bootstrap UCL	N/R
Bootstrap-t UCL	N/R
Hall's Bootstrap UCL	N/A
Percentile Bootstrap UCL	N/R
BCA Bootstrap UCL	N/R
95% Chebyshev (Mean, Sd) UCL	0.000145
97.5% Chebyshev (Mean, Sd) UCL	0.00016
99% Chebyshev (Mean, Sd) UCL	0.000191

Data File	P:\W2-mfg\TEXTRON\GORHAM\Database\P	Variable:	Benzo(a)pyrene N

Raw Statistics	
Number of Valid Samples	12
Number of Unique Samples	2
Minimum	0.0001
Maximum	0.00024
Mean	0.000112
Median	0.0001
Standard Deviation	4.04E-005
Variance	1.63E-009
Coefficient of Variation	0.361921
Skewness	3.464102

Gamma Statistics	
k hat	13.53628
k star (bias corrected)	10.20776
Theta hat	8.25E-006
Theta star	1.09E-005
nu hat	324.8707
nu star	244.9863
Approx.Chi Square Value (.05)	209.7418
Adjusted Level of Significance	0.02896
Adjusted Chi Square Value	204.7648

Log-transformed Statistics	
Minimum of log data	-9.21034
Maximum of log data	-8.334872
Mean of log data	-9.137385
Standard Deviation of log data	0.252726
Variance of log data	0.06387

RECOMMENDATION
Data are Non-parametric (0.05)
Use Student's-t UCL
or Modified-t UCL

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.327007
Shapiro-Wilk 5% Critical Value	0.859
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	0.000133

Gamma Distribution Test	
A-D Test Statistic	4.097373
A-D 5% Critical Value	0.730852
K-S Test Statistic	0.537281
K-S 5% Critical Value	0.245316
Data do not follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	0.00013
Adjusted Gamma UCL	0.000134

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.327007
Shapiro-Wilk 5% Critical Value	0.859
Data not lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	0.000128
95% Chebyshev (MVUE) UCL	0.000146
97.5% Chebyshev (MVUE) UCL	0.000162
99% Chebyshev (MVUE) UCL	0.000192

95% Non-parametric UCLs	
CLT UCL	0.000131
Adj-CLT UCL (Adjusted for skewness)	0.000143
Mod-t UCL (Adjusted for skewness)	0.000135
Jackknife UCL	0.000133
Standard Bootstrap UCL	N/R
Bootstrap-t UCL	N/R
Hall's Bootstrap UCL	N/A
Percentile Bootstrap UCL	N/R
BCA Bootstrap UCL	N/R
95% Chebyshev (Mean, Sd) UCL	0.000163
97.5% Chebyshev (Mean, Sd) UCL	0.000185
99% Chebyshev (Mean, Sd) UCL	0.000228

Data File	P:\W2-mfg\TEXTRON\GORHAM\Database\P	Variable:	Dibenzo(a,h)anthracene N

Raw Statistics	
Number of Valid Samples	12
Number of Unique Samples	2
Minimum	0.0001
Maximum	0.00031
Mean	0.000118
Median	0.0001
Standard Deviation	6.06E-005
Variance	3.68E-009
Coefficient of Variation	0.51593
Skewness	3.464102

Gamma Statistics	
k hat	7.627228
k star (bias corrected)	5.775977
Theta hat	1.54E-005
Theta star	2.03E-005
nu hat	183.0535
nu star	138.6234
Approx.Chi Square Value (.05)	112.4135
Adjusted Level of Significance	0.02896
Adjusted Chi Square Value	108.8146

Log-transformed Statistics	
Minimum of log data	-9.21034
Maximum of log data	-8.078938
Mean of log data	-9.116057
Standard Deviation of log data	0.326608
Variance of log data	0.106673

RECOMMENDATION
Data are Non-parametric (0.05)
Use Student's-t UCL
or Modified-t UCL

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.327007
Shapiro-Wilk 5% Critical Value	0.859
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	0.000149

Gamma Distribution Test	
A-D Test Statistic	4.10681
A-D 5% Critical Value	0.731102
K-S Test Statistic	0.538814
K-S 5% Critical Value	0.245641
Data do not follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	0.000145
Adjusted Gamma UCL	0.00015

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.327007
Shapiro-Wilk 5% Critical Value	0.859
Data not lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	0.00014
95% Chebyshev (MVUE) UCL	0.000163
97.5% Chebyshev (MVUE) UCL	0.000184
99% Chebyshev (MVUE) UCL	0.000225

95% Non-parametric UCLs	
CLT UCL	0.000146
Adj-CLT UCL (Adjusted for skewness)	0.000165
Mod-t UCL (Adjusted for skewness)	0.000152
Jackknife UCL	0.000149
Standard Bootstrap UCL	N/R
Bootstrap-t UCL	N/R
Hall's Bootstrap UCL	N/A
Percentile Bootstrap UCL	N/R
BCA Bootstrap UCL	N/R
95% Chebyshev (Mean, Sd) UCL	0.000194
97.5% Chebyshev (Mean, Sd) UCL	0.000227
99% Chebyshev (Mean, Sd) UCL	0.000292

Data File	P:\W2-mfg\TEXTRON\GORHAM\Database\P	Variable:	Lead T

Raw Statistics	
Number of Valid Samples	12
Number of Unique Samples	6
Minimum	0.0025
Maximum	0.0318
Mean	0.010533
Median	0.0025
Standard Deviation	0.011906
Variance	0.000142
Coefficient of Variation	1.130333
Skewness	1.162688

Gamma Statistics	
k hat	0.979304
k star (bias corrected)	0.790034
Theta hat	0.010756
Theta star	0.013333
nu hat	23.50331
nu star	18.96081
Approx.Chi Square Value (.05)	10.08734
Adjusted Level of Significance	0.02896
Adjusted Chi Square Value	9.114307

Log-transformed Statistics	
Minimum of log data	-5.991465
Maximum of log data	-3.448289
Mean of log data	-5.144081
Standard Deviation of log data	1.109795
Variance of log data	1.231645

RECOMMENDATION
Data are Non-parametric (0.05)
Use 99% Chebyshev (Mean, Sd) UCL

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.698826
Shapiro-Wilk 5% Critical Value	0.859
Data not normal at 5% significance level	
95% UCL (Assuming Normal Distribution)	
Student's-t UCL	0.016706
Gamma Distribution Test	
A-D Test Statistic	1.56314
A-D 5% Critical Value	0.757473
K-S Test Statistic	0.367466
K-S 5% Critical Value	0.252554
Data do not follow gamma distribution	
at 5% significance level	
95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	0.019799
Adjusted Gamma UCL	0.021913
Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.726355
Shapiro-Wilk 5% Critical Value	0.859
Data not lognormal at 5% significance level	
95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	0.030652
95% Chebyshev (MVUE) UCL	0.025134
97.5% Chebyshev (MVUE) UCL	0.031668
99% Chebyshev (MVUE) UCL	0.044503
95% Non-parametric UCLs	
CLT UCL	0.016187
Adj-CLT UCL (Adjusted for skewness)	0.017419
Mod-t UCL (Adjusted for skewness)	0.016898
Jackknife UCL	0.016706
Standard Bootstrap UCL	0.015942
Bootstrap-t UCL	0.019485
Hall's Bootstrap UCL	0.015111
Percentile Bootstrap UCL	0.016008
BCA Bootstrap UCL	0.017283
95% Chebyshev (Mean, Sd) UCL	0.025515
97.5% Chebyshev (Mean, Sd) UCL	0.031997
99% Chebyshev (Mean, Sd) UCL	0.044731

Recommended UCL exceeds the maximum observation

Consider using 95% or 97.5% Chebyshev (Mean, Sd) UCL

Data File	P:\W2-mfg\TEXTRON\GORHAM\Database\P	Variable:	Arsenic

Raw Statistics	
Number of Valid Samples	22
Number of Unique Samples	20
Minimum	0.2
Maximum	45
Mean	17.87955
Median	16.9
Standard Deviation	14.60069
Variance	213.1802
Coefficient of Variation	0.816614
Skewness	0.266505

Gamma Statistics	
k hat	0.797359
k star (bias corrected)	0.718931
Theta hat	22.42346
Theta star	24.86962
nu hat	35.08379
nu star	31.63297
Approx.Chi Square Value (.05)	19.77913
Adjusted Level of Significance	0.0386
Adjusted Chi Square Value	19.07953

Log-transformed Statistics	
Minimum of log data	-1.609438
Maximum of log data	3.806662
Mean of log data	2.13901
Standard Deviation of log data	1.647807
Variance of log data	2.715268

RECOMMENDATION
Assuming gamma distribution (0.05)
Use Approximate Gamma UCL

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.908097
Shapiro-Wilk 5% Critical Value	0.911
Data not normal at 5% significance level	
95% UCL (Assuming Normal Distribution)	
Student's-t UCL	23.23601
Gamma Distribution Test	
A-D Test Statistic	0.908176
A-D 5% Critical Value	0.780665
K-S Test Statistic	0.166838
K-S 5% Critical Value	0.192314
Data follow approximate gamma distibution	
at 5% significance level	
95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	28.59494
Adjusted Gamma UCL	29.64345
Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.846173
Shapiro-Wilk 5% Critical Value	0.911
Data not lognormal at 5% significance level	
95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	117.1731
95% Chebyshev (MVUE) UCL	83.94976
97.5% Chebyshev (MVUE) UCL	107.6866
99% Chebyshev (MVUE) UCL	154.313
95% Non-parametric UCLs	
CLT UCL	22.99977
Adj-CLT UCL (Adjusted for skewness)	23.18876
Mod-t UCL (Adjusted for skewness)	23.26549
Jackknife UCL	23.23601
Standard Bootstrap UCL	22.88911
Bootstrap-t UCL	23.4807
Hall's Bootstrap UCL	23.07694
Percentile Bootstrap UCL	22.99545
BCA Bootstrap UCL	22.91364
95% Chebyshev (Mean, Sd) UCL	31.44826
97.5% Chebyshev (Mean, Sd) UCL	37.31946
99% Chebyshev (Mean, Sd) UCL	48.85229

Data File	P:\W2-mfg\TEXTRON\GORHAM\Database\P	Variable:	Copper

Raw Statistics	
Number of Valid Samples	22
Number of Unique Samples	20
Minimum	8.6
Maximum	2670
Mean	1184.959
Median	1290
Standard Deviation	905.5467
Variance	820014.8
Coefficient of Variation	0.764201
Skewness	-0.078469

Gamma Statistics	
k hat	0.663267
k star (bias corrected)	0.603125
Theta hat	1786.549
Theta star	1964.7
nu hat	29.18375
nu star	26.53748
Approx.Chi Square Value (.05)	15.79203
Adjusted Level of Significance	0.0386
Adjusted Chi Square Value	15.1736

Log-transformed Statistics	
Minimum of log data	2.151762
Maximum of log data	7.889834
Mean of log data	6.159348
Standard Deviation of log data	1.970951
Variance of log data	3.884647

RECOMMENDATION
Data are Non-parametric (0.05)
Use 99% Chebyshev (Mean, Sd) UCL

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.893672
Shapiro-Wilk 5% Critical Value	0.911
Data not normal at 5% significance level	
95% UCL (Assuming Normal Distribution)	
Student's-t UCL	1517.171

Gamma Distribution Test	
A-D Test Statistic	1.860125
A-D 5% Critical Value	0.790353
K-S Test Statistic	0.255127
K-S 5% Critical Value	0.193787
Data do not follow gamma distribution	
at 5% significance level	
95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	1991.247
Adjusted Gamma UCL	2072.404

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.765709
Shapiro-Wilk 5% Critical Value	0.911
Data not lognormal at 5% significance level	
95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	18908.86
95% Chebyshev (MVUE) UCL	8807.429
97.5% Chebyshev (MVUE) UCL	11465.79
99% Chebyshev (MVUE) UCL	16687.63

95% Non-parametric UCLs	
CLT UCL	1502.52
Adj-CLT UCL (Adjusted for skewness)	1499.069
Mod-t UCL (Adjusted for skewness)	1516.633
Jackknife UCL	1517.171
Standard Bootstrap UCL	1494.9
Bootstrap-t UCL	1518.389
Hall's Bootstrap UCL	1487.666
Percentile Bootstrap UCL	1481.555
BCA Bootstrap UCL	1477.405
95% Chebyshev (Mean, Sd) UCL	2026.502
97.5% Chebyshev (Mean, Sd) UCL	2390.638
99% Chebyshev (Mean, Sd) UCL	3105.914

Recommended UCL exceeds the maximum observation

Consider using 95% or 97.5% Chebyshev (Mean, Sd) UCL

Data File	P:\W2-mfg\TEXTRON\GORHAM\Database\P	Variable:	Lead

Raw Statistics	
Number of Valid Samples	22
Number of Unique Samples	21
Minimum	3.7
Maximum	1120
Mean	423.3136
Median	383
Standard Deviation	347.6975
Variance	120893.6
Coefficient of Variation	0.821371
Skewness	0.412687

Gamma Statistics	
k hat	0.826443
k star (bias corrected)	0.744049
Theta hat	512.2117
Theta star	568.9324
nu hat	36.36348
nu star	32.73816
Approx.Chi Square Value (.05)	20.65616
Adjusted Level of Significance	0.0386
Adjusted Chi Square Value	19.93982

Log-transformed Statistics	
Minimum of log data	1.308333
Maximum of log data	7.021084
Mean of log data	5.333031
Standard Deviation of log data	1.621409
Variance of log data	2.628968

RECOMMENDATION
Data are normal (0.05)
Use Student's-t UCL

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.927358
Shapiro-Wilk 5% Critical Value	0.911
Data are normal at 5% significance level	
95% UCL (Assuming Normal Distribution)	
Student's-t UCL	550.8712

Gamma Distribution Test	
A-D Test Statistic	0.710864
A-D 5% Critical Value	0.779249
K-S Test Statistic	0.158418
K-S 5% Critical Value	0.19209
Data follow gamma distribution	
at 5% significance level	
95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	670.9142
Adjusted Gamma UCL	695.0168

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.854094
Shapiro-Wilk 5% Critical Value	0.911
Data not lognormal at 5% significance level	
95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	2641.581
95% Chebyshev (MVUE) UCL	1948.254
97.5% Chebyshev (MVUE) UCL	2495.545
99% Chebyshev (MVUE) UCL	3570.592

95% Non-parametric UCLs	
CLT UCL	545.2456
Adj-CLT UCL (Adjusted for skewness)	552.2147
Mod-t UCL (Adjusted for skewness)	551.9582
Jackknife UCL	550.8712
Standard Bootstrap UCL	541.8794
Bootstrap-t UCL	556.2456
Hall's Bootstrap UCL	553.6826
Percentile Bootstrap UCL	546.2591
BCA Bootstrap UCL	549.9864
95% Chebyshev (Mean, Sd) UCL	746.436
97.5% Chebyshev (Mean, Sd) UCL	886.2513
99% Chebyshev (Mean, Sd) UCL	1160.891

Data File	P:\W2-mfg\TEXTRON\GORHAM\Database\P	Variable:	Benzo(a)pyrene	

Raw Statistics	
Number of Valid Samples	22
Number of Unique Samples	22
Minimum	0.0161
Maximum	7.87
Mean	0.678077
Median	0.195
Standard Deviation	1.657727
Variance	2.74806
Coefficient of Variation	2.444747
Skewness	4.26345

Gamma Statistics	
k hat	0.51635
k star (bias corrected)	0.476241
Theta hat	1.313214
Theta star	1.42381
nu hat	22.71938
nu star	20.95462
Approx.Chi Square Value (.05)	11.55631
Adjusted Level of Significance	0.0386
Adjusted Chi Square Value	11.03615

Log-transformed Statistics	
Minimum of log data	-4.128936
Maximum of log data	2.063058
Mean of log data	-1.612531
Standard Deviation of log data	1.524305
Variance of log data	2.323506

RECOMMENDATION
Data are lognormal (0.05)
Use 95% Chebyshev (MVUE) UCL

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.393949
Shapiro-Wilk 5% Critical Value	0.911
Data not normal at 5% significance level	
95% UCL (Assuming Normal Distribution)	
Student's-t UCL	1.286237

Gamma Distribution Test	
A-D Test Statistic	1.230128
A-D 5% Critical Value	0.802858
K-S Test Statistic	0.217867
K-S 5% Critical Value	0.195661
Data do not follow gamma distribution	
at 5% significance level	
95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	1.229531
Adjusted Gamma UCL	1.287483

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.963586
Shapiro-Wilk 5% Critical Value	0.911
Data are lognormal at 5% significance level	
95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	1.926154
95% Chebyshev (MVUE) UCL	1.568053
97.5% Chebyshev (MVUE) UCL	1.997296
99% Chebyshev (MVUE) UCL	2.840461

95% Non-parametric UCLs	
CLT UCL	1.259416
Adj-CLT UCL (Adjusted for skewness)	1.602683
Mod-t UCL (Adjusted for skewness)	1.33978
Jackknife UCL	1.286237
Standard Bootstrap UCL	1.254239
Bootstrap-t UCL	3.698643
Hall's Bootstrap UCL	3.433729
Percentile Bootstrap UCL	1.344955
BCA Bootstrap UCL	1.770473
95% Chebyshev (Mean, Sd) UCL	2.218637
97.5% Chebyshev (Mean, Sd) UCL	2.885239
99% Chebyshev (Mean, Sd) UCL	4.194648

Data File	P:\W2-mfg\TEXTRON\GORHAM\Database\P	Variable:	cis-1,2-Dichloroethene

Raw Statistics	
Number of Valid Samples	22
Number of Unique Samples	22
Minimum	0.00215
Maximum	175
Mean	13.69208
Median	0.011525
Standard Deviation	42.17576
Variance	1778.795
Coefficient of Variation	3.080304
Skewness	3.39605

Gamma Statistics	
k hat	0.138594
k star (bias corrected)	0.149998
Theta hat	98.79299
Theta star	91.28203
nu hat	6.098119
nu star	6.599891
Approx.Chi Square Value (.05)	1.953169
Adjusted Level of Significance	0.0386
Adjusted Chi Square Value	1.770563

Log-transformed Statistics	
Minimum of log data	-6.142287
Maximum of log data	5.164786
Mean of log data	-2.992096
Standard Deviation of log data	3.541953
Variance of log data	12.54543

RECOMMENDATION
Data are Non-parametric (0.05)
Use Hall's Bootstrap UCL
In case Hall's Bootstrap method yields an erratic, unreasonably large UCL value, use 99% Chebyshev (Mean, Sd) UCL

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.37405
Shapiro-Wilk 5% Critical Value	0.911
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	29.16483

Gamma Distribution Test	
A-D Test Statistic	3.660136
A-D 5% Critical Value	0.917336
K-S Test Statistic	0.380241
K-S 5% Critical Value	0.207646
Data do not follow gamma distribution at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	46.26647
Adjusted Gamma UCL	51.03811

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.776502
Shapiro-Wilk 5% Critical Value	0.911
Data not lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	5214.254
95% Chebyshev (MVUE) UCL	35.19229
97.5% Chebyshev (MVUE) UCL	47.24041
99% Chebyshev (MVUE) UCL	70.90662

95% Non-parametric UCLs	
CLT UCL	28.48244
Adj-CLT UCL (Adjusted for skewness)	35.439
Mod-t UCL (Adjusted for skewness)	30.24991
Jackknife UCL	29.16483
Standard Bootstrap UCL	27.88537
Bootstrap-t UCL	178.1538
Hall's Bootstrap UCL	172.5078
Percentile Bootstrap UCL	30.49156
BCA Bootstrap UCL	34.76294
95% Chebyshev (Mean, Sd) UCL	52.88687
97.5% Chebyshev (Mean, Sd) UCL	69.84649
99% Chebyshev (Mean, Sd) UCL	103.1604

Data File	P:\W2-mfg\TEXTRON\GORHAM\Database\P	Variable:	Tetrachloroethene	
Raw Statistics			Normal Distribution Test	
Number of Valid Samples	22		Shapiro-Wilk Test Statisitic	0.248866
Number of Unique Samples	22		Shapiro-Wilk 5% Critical Value	0.911
Minimum	0.00215		Data not normal at 5% significance level	
Maximum	18.1			
Mean	0.904939		95% UCL (Assuming Normal Distribution)	
Median	0.007775		Student's-t UCL	2.316712
Standard Deviation	3.848224			
Variance	14.80882		Gamma Distribution Test	
Coefficient of Variation	4.252469		A-D Test Statistic	4.841571
Skewness	4.66058		A-D 5% Critical Value	0.898236
			K-S Test Statistic	0.408206
Gamma Statistics			K-S 5% Critical Value	0.206073
k hat	0.184451		Data do not follow gamma distribution	
k star (bias corrected)	0.189601		at 5% significance level	
Theta hat	4.906132			
Theta star	4.772852		95% UCLs (Assuming Gamma Distribution)	
nu hat	8.115823		Approximate Gamma UCL	2.572912
nu star	8.342453		Adjusted Gamma UCL	2.79677
Approx.Chi Square Value (.05)	2.934188			
Adjusted Level of Significance	0.0386		Lognormal Distribution Test	
Adjusted Chi Square Value	2.699331		Shapiro-Wilk Test Statisitic	0.74459
			Shapiro-Wilk 5% Critical Value	0.911
Log-transformed Statistics			Data not lognormal at 5% significance level	
Minimum of log data	-6.142287			
Maximum of log data	2.895912		95% UCLs (Assuming Lognormal Distribution)	
Mean of log data	-4.13995		95% H-UCL	1.717584
Standard Deviation of log data	2.231112		95% Chebyshev (MVUE) UCL	0.509604
Variance of log data	4.97786		97.5% Chebyshev (MVUE) UCL	0.669317
			99% Chebyshev (MVUE) UCL	0.983041
			95% Non-parametric UCLs	
			CLT UCL	2.254449
			Adj-CLT UCL (Adjusted for skewness)	3.125529
			Mod-t UCL (Adjusted for skewness)	2.452582
			Jackknife UCL	2.316712
			Standard Bootstrap UCL	2.230954
			Bootstrap-t UCL	29.90711
RECOMMENDATION			Hall's Bootstrap UCL	30.02223
Data are Non-parametric (0.05)			Percentile Bootstrap UCL	2.508695
			BCA Bootstrap UCL	3.462584
Use 99% Chebyshev (Mean, Sd) UCL			95% Chebyshev (Mean, Sd) UCL	4.481171
			97.5% Chebyshev (Mean, Sd) UCL	6.02861
			99% Chebyshev (Mean, Sd) UCL	9.068254

Data File	P:\W2-mfg\TEXTRON\GORHAM\Database\P	Variable:	Trichloroethene	

Raw Statistics	
Number of Valid Samples	22
Number of Unique Samples	22
Minimum	0.00215
Maximum	58.4
Mean	3.725218
Median	0.012125
Standard Deviation	12.66211
Variance	160.3292
Coefficient of Variation	3.399026
Skewness	4.232389

Gamma Statistics	
k hat	0.175303
k star (bias corrected)	0.181701
Theta hat	21.25014
Theta star	20.50188
nu hat	7.713342
nu star	7.994856
Approx.Chi Square Value (.05)	2.731361
Adjusted Level of Significance	0.0386
Adjusted Chi Square Value	2.506532

Log-transformed Statistics	
Minimum of log data	-6.142287
Maximum of log data	4.067316
Mean of log data	-2.968837
Standard Deviation of log data	3.046968
Variance of log data	9.284014

RECOMMENDATION
Data are Non-parametric (0.05)
Use Hall's Bootstrap UCL
In case Hall's Bootstrap method yields an erratic, unreasonably large UCL value, use 99% Chebyshev (Mean, Sd) UCL

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.333113
Shapiro-Wilk 5% Critical Value	0.911
Data not normal at 5% significance level	
95% UCL (Assuming Normal Distribution)	
Student's-t UCL	8.370487

Gamma Distribution Test	
A-D Test Statistic	2.685147
A-D 5% Critical Value	0.902046
K-S Test Statistic	0.268917
K-S 5% Critical Value	0.206387
Data do not follow gamma distribution at 5% significance level	
95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	10.90394
Adjusted Gamma UCL	11.88199

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.874964
Shapiro-Wilk 5% Critical Value	0.911
Data not lognormal at 5% significance level	
95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	276.4331
95% Chebyshev (MVUE) UCL	10.53933
97.5% Chebyshev (MVUE) UCL	14.07468
99% Chebyshev (MVUE) UCL	21.01919

95% Non-parametric UCLs	
CLT UCL	8.165619
Adj-CLT UCL (Adjusted for skewness)	10.76847
Mod-t UCL (Adjusted for skewness)	8.776479
Jackknife UCL	8.370487
Standard Bootstrap UCL	8.039094
Bootstrap-t UCL	39.68097
Hall's Bootstrap UCL	40.34469
Percentile Bootstrap UCL	8.797334
BCA Bootstrap UCL	11.76118
95% Chebyshev (Mean, Sd) UCL	15.49238
97.5% Chebyshev (Mean, Sd) UCL	20.58404
99% Chebyshev (Mean, Sd) UCL	30.58562

Data File	P:\W2-mfg\TEXTRON\GORHAM\Database\P	Variable:	Aroclor-1254

Raw Statistics	
Number of Valid Samples	22
Number of Unique Samples	22
Minimum	0.008
Maximum	0.528
Mean	0.098325
Median	0.06875
Standard Deviation	0.113072
Variance	0.012785
Coefficient of Variation	1.149982
Skewness	2.839661

Gamma Statistics	
k hat	1.192162
k star (bias corrected)	1.059897
Theta hat	0.082476
Theta star	0.092768
nu hat	52.45511
nu star	46.63547
Approx.Chi Square Value (.05)	31.96273
Adjusted Level of Significance	0.0386
Adjusted Chi Square Value	31.05581

Log-transformed Statistics	
Minimum of log data	-4.828314
Maximum of log data	-0.638659
Mean of log data	-2.794265
Standard Deviation of log data	1.011312
Variance of log data	1.022751

RECOMMENDATION
Data follow gamma distribution (0.05)
Use Approximate Gamma UCL

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.685835
Shapiro-Wilk 5% Critical Value	0.911
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	0.139807

Gamma Distribution Test	
A-D Test Statistic	0.41619
A-D 5% Critical Value	0.766142
K-S Test Statistic	0.150101
K-S 5% Critical Value	0.189901
Data follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	0.143462
Adjusted Gamma UCL	0.147651

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.98112
Shapiro-Wilk 5% Critical Value	0.911
Data are lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	0.179636
95% Chebyshev (MVUE) UCL	0.203346
97.5% Chebyshev (MVUE) UCL	0.24864
99% Chebyshev (MVUE) UCL	0.337611

95% Non-parametric UCLs	
CLT UCL	0.137978
Adj-CLT UCL (Adjusted for skewness)	0.153572
Mod-t UCL (Adjusted for skewness)	0.142239
Jackknife UCL	0.139807
Standard Bootstrap UCL	0.136415
Bootstrap-t UCL	0.17379
Hall's Bootstrap UCL	0.306637
Percentile Bootstrap UCL	0.142798
BCA Bootstrap UCL	0.156339
95% Chebyshev (Mean, Sd) UCL	0.203405
97.5% Chebyshev (Mean, Sd) UCL	0.248873
99% Chebyshev (Mean, Sd) UCL	0.338187

Data File	P:\W2-mfg\TEXTRON\GORHAM\Database\P	Variable:	Benzo(a)anthracene	

Raw Statistics	
Number of Valid Samples	22
Number of Unique Samples	22
Minimum	0.0161
Maximum	15.1
Mean	1.073482
Median	0.2295
Standard Deviation	3.168722
Variance	10.0408
Coefficient of Variation	2.951817
Skewness	4.524687

Gamma Statistics	
k hat	0.436173
k star (bias corrected)	0.406998
Theta hat	2.461139
Theta star	2.637563
nu hat	19.1916
nu star	17.9079
Approx.Chi Square Value (.05)	9.322965
Adjusted Level of Significance	0.0386
Adjusted Chi Square Value	8.861823

Log-transformed Statistics	
Minimum of log data	-4.128936
Maximum of log data	2.714695
Mean of log data	-1.416973
Standard Deviation of log data	1.621529
Variance of log data	2.629356

RECOMMENDATION
Data are lognormal (0.05)
Use 95% Chebyshev (MVUE) UCL

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.327472
Shapiro-Wilk 5% Critical Value	0.911
Data not normal at 5% significance level	
95% UCL (Assuming Normal Distribution)	
Student's-t UCL	2.23597

Gamma Distribution Test	
A-D Test Statistic	1.684582
A-D 5% Critical Value	0.818085
K-S Test Statistic	0.266323
K-S 5% Critical Value	0.197552
Data do not follow gamma distribution	
at 5% significance level	
95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	2.061984
Adjusted Gamma UCL	2.169283

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.952451
Shapiro-Wilk 5% Critical Value	0.911
Data are lognormal at 5% significance level	
95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	3.094052
95% Chebyshev (MVUE) UCL	2.281672
97.5% Chebyshev (MVUE) UCL	2.922643
99% Chebyshev (MVUE) UCL	4.181708

95% Non-parametric UCLs	
CLT UCL	2.184702
Adj-CLT UCL (Adjusted for skewness)	2.881056
Mod-t UCL (Adjusted for skewness)	2.344588
Jackknife UCL	2.23597
Standard Bootstrap UCL	2.128696
Bootstrap-t UCL	9.325929
Hall's Bootstrap UCL	6.311884
Percentile Bootstrap UCL	2.367605
BCA Bootstrap UCL	3.233032
95% Chebyshev (Mean, Sd) UCL	4.018239
97.5% Chebyshev (Mean, Sd) UCL	5.292438
99% Chebyshev (Mean, Sd) UCL	7.795356

Data File	P:\W2-mfg\TEXTRON\GORHAM\Database\P	Variable:	Benzo(b)fluoranthene	

Raw Statistics	
Number of Valid Samples	22
Number of Unique Samples	22
Minimum	0.0161
Maximum	14.8
Mean	1.186532
Median	0.3025
Standard Deviation	3.11204
Variance	9.684795
Coefficient of Variation	2.622804
Skewness	4.367165

Gamma Statistics	
k hat	0.465062
k star (bias corrected)	0.431947
Theta hat	2.551341
Theta star	2.746936
nu hat	20.46273
nu star	19.00569
Approx.Chi Square Value (.05)	10.1201
Adjusted Level of Significance	0.0386
Adjusted Chi Square Value	9.637167

Log-transformed Statistics	
Minimum of log data	-4.128936
Maximum of log data	2.694627
Mean of log data	-1.210318
Standard Deviation of log data	1.67126
Variance of log data	2.793109

RECOMMENDATION
Assuming gamma distribution (0.05)
Use Adjusted Gamma UCL

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.370807
Shapiro-Wilk 5% Critical Value	0.911
Data not normal at 5% significance level	
95% UCL (Assuming Normal Distribution)	
Student's-t UCL	2.328226
Gamma Distribution Test	
A-D Test Statistic	1.205357
A-D 5% Critical Value	0.811823
K-S Test Statistic	0.195053
K-S 5% Critical Value	0.196791
Data follow approximate gamma distibution	
at 5% significance level	
95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	2.228324
Adjusted Gamma UCL	2.339988
Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.962143
Shapiro-Wilk 5% Critical Value	0.911
Data are lognormal at 5% significance level	
95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	4.415696
95% Chebyshev (MVUE) UCL	3.08082
97.5% Chebyshev (MVUE) UCL	3.956831
99% Chebyshev (MVUE) UCL	5.677587
95% Non-parametric UCLs	
CLT UCL	2.277874
Adj-CLT UCL (Adjusted for skewness)	2.937964
Mod-t UCL (Adjusted for skewness)	2.431187
Jackknife UCL	2.328226
Standard Bootstrap UCL	2.268795
Bootstrap-t UCL	7.518312
Hall's Bootstrap UCL	6.448299
Percentile Bootstrap UCL	2.378959
BCA Bootstrap UCL	3.187064
95% Chebyshev (Mean, Sd) UCL	4.078614
97.5% Chebyshev (Mean, Sd) UCL	5.330021
99% Chebyshev (Mean, Sd) UCL	7.788166

Data File	P:\W2-mfg\TEXTRON\GORHAM\Database\P	Variable:	Cadmium

Raw Statistics	
Number of Valid Samples	22
Number of Unique Samples	21
Minimum	0.14
Maximum	7.11
Mean	2.943864
Median	2.835
Standard Deviation	2.314155
Variance	5.355314
Coefficient of Variation	0.786095
Skewness	0.409776

Gamma Statistics	
k hat	1.196964
k star (bias corrected)	1.064044
Theta hat	2.459443
Theta star	2.766674
nu hat	52.6664
nu star	46.81795
Approx.Chi Square Value (.05)	32.114
Adjusted Level of Significance	0.0386
Adjusted Chi Square Value	31.20478

Log-transformed Statistics	
Minimum of log data	-1.966113
Maximum of log data	1.961502
Mean of log data	0.60704
Standard Deviation of log data	1.154314
Variance of log data	1.332442

RECOMMENDATION
Data follow gamma distribution (0.05)
Use Approximate Gamma UCL

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.907849
Shapiro-Wilk 5% Critical Value	0.911
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	3.792843

Gamma Distribution Test	
A-D Test Statistic	0.603282
A-D 5% Critical Value	0.766026
K-S Test Statistic	0.162059
K-S 5% Critical Value	0.189879
Data follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	4.291762
Adjusted Gamma UCL	4.416812

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.907118
Shapiro-Wilk 5% Critical Value	0.911
Data not lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	7.166629
95% Chebyshev (MVUE) UCL	7.635151
97.5% Chebyshev (MVUE) UCL	9.463705
99% Chebyshev (MVUE) UCL	13.05554

95% Non-parametric UCLs	
CLT UCL	3.755401
Adj-CLT UCL (Adjusted for skewness)	3.801458
Mod-t UCL (Adjusted for skewness)	3.800027
Jackknife UCL	3.792843
Standard Bootstrap UCL	3.728924
Bootstrap-t UCL	3.83811
Hall's Bootstrap UCL	3.773254
Percentile Bootstrap UCL	3.714091
BCA Bootstrap UCL	3.85
95% Chebyshev (Mean, Sd) UCL	5.094455
97.5% Chebyshev (Mean, Sd) UCL	6.025018
99% Chebyshev (Mean, Sd) UCL	7.852928

Data File	P:\W2-mfg\TEXTRON\GORHAM\Database\P	Variable:	Chromium		
Raw Statistics				Normal Distribution Test	
Number of Valid Samples	22			Shapiro-Wilk Test Statisitic	0.870166
Number of Unique Samples	22			Shapiro-Wilk 5% Critical Value	0.911
Minimum	4.8			Data not normal at 5% significance level	
Maximum	640				
Mean	231.1909			95% UCL (Assuming Normal Distribution)	
Median	160			Student's-t UCL	312.8782
Standard Deviation	222.664				
Variance	49579.26			Gamma Distribution Test	
Coefficient of Variation	0.963117			A-D Test Statistic	0.691304
Skewness	0.581998			A-D 5% Critical Value	0.788333
				K-S Test Statistic	0.143201
Gamma Statistics				K-S 5% Critical Value	0.193484
k hat	0.686992			Data follow gamma distribution	
k star (bias corrected)	0.623614			at 5% significance level	
Theta hat	336.5263				
Theta star	370.7274			95% UCLs (Assuming Gamma Distribution)	
nu hat	30.22765			Approximate Gamma UCL	384.6953
nu star	27.43903			Adjusted Gamma UCL	400.0598
Approx.Chi Square Value (.05)	16.49008				
Adjusted Level of Significance	0.0386			Lognormal Distribution Test	
Adjusted Chi Square Value	15.85677			Shapiro-Wilk Test Statisitic	0.883708
				Shapiro-Wilk 5% Critical Value	0.911
Log-transformed Statistics				Data not lognormal at 5% significance level	
Minimum of log data	1.568616				
Maximum of log data	6.461468			95% UCLs (Assuming Lognormal Distribution)	
Mean of log data	4.561234			95% H-UCL	1454.878
Standard Deviation of log data	1.679772			95% Chebyshev (MVUE) UCL	1005.151
Variance of log data	2.821632			97.5% Chebyshev (MVUE) UCL	1291.532
				99% Chebyshev (MVUE) UCL	1854.072
				95% Non-parametric UCLs	
				CLT UCL	309.2756
				Adj-CLT UCL (Adjusted for skewness)	315.5696
				Mod-t UCL (Adjusted for skewness)	313.86
				Jackknife UCL	312.8782
				Standard Bootstrap UCL	306.8495
				Bootstrap-t UCL	317.6237
RECOMMENDATION				Hall's Bootstrap UCL	309.1281
Data follow gamma distribution (0.05)				Percentile Bootstrap UCL	307.1409
				BCA Bootstrap UCL	315.0409
Use Approximate Gamma UCL				95% Chebyshev (Mean, Sd) UCL	438.1171
				97.5% Chebyshev (Mean, Sd) UCL	527.6542
				99% Chebyshev (Mean, Sd) UCL	703.5326

Data File	P:\W2-mfg\TEXTRON\GORHAM\Database\P	Variable:	Dibenzo(a,h)anthracene

Raw Statistics	
Number of Valid Samples	22
Number of Unique Samples	21
Minimum	0.00395
Maximum	1.45
Mean	0.11405
Median	0.040925
Standard Deviation	0.301982
Variance	0.091193
Coefficient of Variation	2.647799
Skewness	4.517431

Gamma Statistics	
k hat	0.60188
k star (bias corrected)	0.550109
Theta hat	0.18949
Theta star	0.207323
nu hat	26.48273
nu star	24.20478
Approx.Chi Square Value (.05)	14.00277
Adjusted Level of Significance	0.0386
Adjusted Chi Square Value	13.42404

Log-transformed Statistics	
Minimum of log data	-5.53404
Maximum of log data	0.371564
Mean of log data	-3.197221
Standard Deviation of log data	1.222772
Variance of log data	1.495172

RECOMMENDATION
Data are lognormal (0.05)
Use 95% Chebyshev (MVUE) UCL

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.331619
Shapiro-Wilk 5% Critical Value	0.911
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	0.224836

Gamma Distribution Test	
A-D Test Statistic	2.117882
A-D 5% Critical Value	0.795578
K-S Test Statistic	0.30073
K-S 5% Critical Value	0.19457
Data do not follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	0.197144
Adjusted Gamma UCL	0.205643

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.932671
Shapiro-Wilk 5% Critical Value	0.911
Data are lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	0.185353
95% Chebyshev (MVUE) UCL	0.190211
97.5% Chebyshev (MVUE) UCL	0.237146
99% Chebyshev (MVUE) UCL	0.329343

95% Non-parametric UCLs	
CLT UCL	0.21995
Adj-CLT UCL (Adjusted for skewness)	0.286207
Mod-t UCL (Adjusted for skewness)	0.235171
Jackknife UCL	0.224836
Standard Bootstrap UCL	0.217007
Bootstrap-t UCL	0.931423
Hall's Bootstrap UCL	0.695671
Percentile Bootstrap UCL	0.240734
BCA Bootstrap UCL	0.325398
95% Chebyshev (Mean, Sd) UCL	0.394688
97.5% Chebyshev (Mean, Sd) UCL	0.51612
99% Chebyshev (Mean, Sd) UCL	0.75465

Data File	P:\W2-mfg\TEXTRON\GORHAM\Database\P	Variable:	Indeno(1,2,3-cd)pyrene

Raw Statistics	
Number of Valid Samples	22
Number of Unique Samples	21
Minimum	0.015
Maximum	2.47
Mean	0.242193
Median	0.10075
Standard Deviation	0.522256
Variance	0.272751
Coefficient of Variation	2.15636
Skewness	4.075206

Gamma Statistics	
k hat	0.645993
k star (bias corrected)	0.588206
Theta hat	0.374916
Theta star	0.411749
nu hat	28.42368
nu star	25.88106
Approx.Chi Square Value (.05)	15.28599
Adjusted Level of Significance	0.0386
Adjusted Chi Square Value	14.67856

Log-transformed Statistics	
Minimum of log data	-4.199705
Maximum of log data	0.904218
Mean of log data	-2.364255
Standard Deviation of log data	1.279984
Variance of log data	1.638358

RECOMMENDATION
Data are lognormal (0.05)
Use 95% Chebyshev (MVUE) UCL

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.427169
Shapiro-Wilk 5% Critical Value	0.911
Data not normal at 5% significance level	
95% UCL (Assuming Normal Distribution)	
Student's-t UCL	0.43379
Gamma Distribution Test	
A-D Test Statistic	1.310429
A-D 5% Critical Value	0.791823
K-S Test Statistic	0.229304
K-S 5% Critical Value	0.194007
Data do not follow gamma distribution	
at 5% significance level	
95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	0.410063
Adjusted Gamma UCL	0.427032
Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.949977
Shapiro-Wilk 5% Critical Value	0.911
Data are lognormal at 5% significance level	
95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	0.486062
95% Chebyshev (MVUE) UCL	0.481419
97.5% Chebyshev (MVUE) UCL	0.602969
99% Chebyshev (MVUE) UCL	0.84173
95% Non-parametric UCLs	
CLT UCL	0.42534
Adj-CLT UCL (Adjusted for skewness)	0.528709
Mod-t UCL (Adjusted for skewness)	0.449913
Jackknife UCL	0.43379
Standard Bootstrap UCL	0.413182
Bootstrap-t UCL	1.130057
Hall's Bootstrap UCL	1.154162
Percentile Bootstrap UCL	0.451325
BCA Bootstrap UCL	0.580695
95% Chebyshev (Mean, Sd) UCL	0.727536
97.5% Chebyshev (Mean, Sd) UCL	0.937544
99% Chebyshev (Mean, Sd) UCL	1.350065

Data File	P:\W2-mfg\TEXTRON\GORHAM\Database\P	Variable:	Mercury

Raw Statistics	
Number of Valid Samples	22
Number of Unique Samples	22
Minimum	0.0215
Maximum	2.52
Mean	0.503341
Median	0.1625
Standard Deviation	0.655874
Variance	0.430171
Coefficient of Variation	1.303042
Skewness	1.739941

Gamma Statistics	
k hat	0.639645
k star (bias corrected)	0.582723
Theta hat	0.786907
Theta star	0.863773
nu hat	28.14436
nu star	25.63982
Approx.Chi Square Value (.05)	15.10051
Adjusted Level of Significance	0.0386
Adjusted Chi Square Value	14.49715

Log-transformed Statistics	
Minimum of log data	-3.839702
Maximum of log data	0.924259
Mean of log data	-1.643475
Standard Deviation of log data	1.538791
Variance of log data	2.367878

RECOMMENDATION
Data follow gamma distribution (0.05)
Use Approximate Gamma UCL

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.7544
Shapiro-Wilk 5% Critical Value	0.911
Data not normal at 5% significance level	
95% UCL (Assuming Normal Distribution)	
Student's-t UCL	0.743957

Gamma Distribution Test	
A-D Test Statistic	0.680755
A-D 5% Critical Value	0.792363
K-S Test Statistic	0.170078
K-S 5% Critical Value	0.194088
Data follow gamma distribution	
at 5% significance level	
95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	0.854645
Adjusted Gamma UCL	0.890215

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.935811
Shapiro-Wilk 5% Critical Value	0.911
Data are lognormal at 5% significance level	
95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	1.944452
95% Chebyshev (MVUE) UCL	1.561013
97.5% Chebyshev (MVUE) UCL	1.990065
99% Chebyshev (MVUE) UCL	2.832856

95% Non-parametric UCLs	
CLT UCL	0.733346
Adj-CLT UCL (Adjusted for skewness)	0.788771
Mod-t UCL (Adjusted for skewness)	0.752603
Jackknife UCL	0.743957
Standard Bootstrap UCL	0.734401
Bootstrap-t UCL	0.859906
Hall's Bootstrap UCL	0.813889
Percentile Bootstrap UCL	0.748614
BCA Bootstrap UCL	0.791659
95% Chebyshev (Mean, Sd) UCL	1.112858
97.5% Chebyshev (Mean, Sd) UCL	1.376597
99% Chebyshev (Mean, Sd) UCL	1.894661

Data File	P:\W2-mfg\TEXTRON\GORHAM\Database\P	Variable:	Nickel

Raw Statistics	
Number of Valid Samples	22
Number of Unique Samples	22
Minimum	1.85
Maximum	853
Mean	160.6386
Median	92.9
Standard Deviation	239.7472
Variance	57478.71
Coefficient of Variation	1.492463
Skewness	2.269085

Gamma Statistics	
k hat	0.578636
k star (bias corrected)	0.530034
Theta hat	277.6159
Theta star	303.0722
nu hat	25.45999
nu star	23.32151
Approx.Chi Square Value (.05)	13.33218
Adjusted Level of Significance	0.0386
Adjusted Chi Square Value	12.76897

Log-transformed Statistics	
Minimum of log data	0.615186
Maximum of log data	6.74876
Mean of log data	4.005583
Standard Deviation of log data	1.710179
Variance of log data	2.924713

RECOMMENDATION
Data follow gamma distribution (0.05)
Use Approximate Gamma UCL

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.647752
Shapiro-Wilk 5% Critical Value	0.911
Data not normal at 5% significance level	

95% UCL (Assuming Normal Distribution)	
Student's-t UCL	248.5931

Gamma Distribution Test	
A-D Test Statistic	0.434589
A-D 5% Critical Value	0.797556
K-S Test Statistic	0.153242
K-S 5% Critical Value	0.194867
Data follow gamma distribution	
at 5% significance level	

95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	280.9994
Adjusted Gamma UCL	293.3937

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.959606
Shapiro-Wilk 5% Critical Value	0.911
Data are lognormal at 5% significance level	

95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	916.7624
95% Chebyshev (MVUE) UCL	611.0652
97.5% Chebyshev (MVUE) UCL	786.386
99% Chebyshev (MVUE) UCL	1130.77

95% Non-parametric UCLs	
CLT UCL	244.7141
Adj-CLT UCL (Adjusted for skewness)	271.1359
Mod-t UCL (Adjusted for skewness)	252.7144
Jackknife UCL	248.5931
Standard Bootstrap UCL	245.6553
Bootstrap-t UCL	342.6473
Hall's Bootstrap UCL	370.4883
Percentile Bootstrap UCL	246.0523
BCA Bootstrap UCL	270.0523
95% Chebyshev (Mean, Sd) UCL	383.4406
97.5% Chebyshev (Mean, Sd) UCL	479.8472
99% Chebyshev (Mean, Sd) UCL	669.2192

Data File	P:\W2-mfg\TEXTRON\GORHAM\Database\P	Variable:	s-Butylbenzene

Raw Statistics	
Number of Valid Samples	22
Number of Unique Samples	22
Minimum	0.00205
Maximum	0.55
Mean	0.036527
Median	0.0064
Standard Deviation	0.115798
Variance	0.013409
Coefficient of Variation	3.170179
Skewness	4.551686

Gamma Statistics	
k hat	0.449758
k star (bias corrected)	0.41873
Theta hat	0.081215
Theta star	0.087233
nu hat	19.78934
nu star	18.42413
Approx.Chi Square Value (.05)	9.696677
Adjusted Level of Significance	0.0386
Adjusted Chi Square Value	9.225212

Log-transformed Statistics	
Minimum of log data	-6.189915
Maximum of log data	-0.597837
Mean of log data	-4.745622
Standard Deviation of log data	1.333213
Variance of log data	1.777457

RECOMMENDATION
Data are Non-parametric (0.05)
Use 99% Chebyshev (Mean, Sd) UCL

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.305209
Shapiro-Wilk 5% Critical Value	0.911
Data not normal at 5% significance level	
95% UCL (Assuming Normal Distribution)	
Student's-t UCL	0.079009

Gamma Distribution Test	
A-D Test Statistic	2.938323
A-D 5% Critical Value	0.81514
K-S Test Statistic	0.280533
K-S 5% Critical Value	0.197194
Data do not follow gamma distribution	
at 5% significance level	
95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	0.069403
Adjusted Gamma UCL	0.07295

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.868427
Shapiro-Wilk 5% Critical Value	0.911
Data not lognormal at 5% significance level	
95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	0.05101
95% Chebyshev (MVUE) UCL	0.048718
97.5% Chebyshev (MVUE) UCL	0.061265
99% Chebyshev (MVUE) UCL	0.085911

95% Non-parametric UCLs	
CLT UCL	0.077136
Adj-CLT UCL (Adjusted for skewness)	0.102735
Mod-t UCL (Adjusted for skewness)	0.083002
Jackknife UCL	0.079009
Standard Bootstrap UCL	0.075745
Bootstrap-t UCL	0.474775
Hall's Bootstrap UCL	0.243644
Percentile Bootstrap UCL	0.083411
BCA Bootstrap UCL	0.115993
95% Chebyshev (Mean, Sd) UCL	0.144141
97.5% Chebyshev (Mean, Sd) UCL	0.190705
99% Chebyshev (Mean, Sd) UCL	0.282172

Data File	P:\W2-mfg\TEXTRON\GORHAM\Database\P	Variable:	Vinyl chloride	

Raw Statistics	
Number of Valid Samples	22
Number of Unique Samples	22
Minimum	0.00405
Maximum	24.8
Mean	2.203714
Median	0.01835
Standard Deviation	5.776878
Variance	33.37232
Coefficient of Variation	2.621429
Skewness	3.334252

Gamma Statistics	
k hat	0.199365
k star (bias corrected)	0.202482
Theta hat	11.05366
Theta star	10.88351
nu hat	8.772062
nu star	8.909205
Approx.Chi Square Value (.05)	3.27145
Adjusted Level of Significance	0.0386
Adjusted Chi Square Value	3.020619

Log-transformed Statistics	
Minimum of log data	-5.509038
Maximum of log data	3.210844
Mean of log data	-2.903008
Standard Deviation of log data	2.813926
Variance of log data	7.918181

RECOMMENDATION
Data are Non-parametric (0.05)
Use 99% Chebyshev (Mean, Sd) UCL

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.450108
Shapiro-Wilk 5% Critical Value	0.911
Data not normal at 5% significance level	
95% UCL (Assuming Normal Distribution)	
Student's-t UCL	4.32304
Gamma Distribution Test	
A-D Test Statistic	3.064137
A-D 5% Critical Value	0.892024
K-S Test Statistic	0.355642
K-S 5% Critical Value	0.205562
Data do not follow gamma distribution	
at 5% significance level	
95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	6.001418
Adjusted Gamma UCL	6.499773
Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.805178
Shapiro-Wilk 5% Critical Value	0.911
Data not lognormal at 5% significance level	
95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	85.42709
95% Chebyshev (MVUE) UCL	6.472896
97.5% Chebyshev (MVUE) UCL	8.614237
99% Chebyshev (MVUE) UCL	12.82049
95% Non-parametric UCLs	
CLT UCL	4.229572
Adj-CLT UCL (Adjusted for skewness)	5.165084
Mod-t UCL (Adjusted for skewness)	4.468961
Jackknife UCL	4.32304
Standard Bootstrap UCL	4.140826
Bootstrap-t UCL	8.689712
Hall's Bootstrap UCL	11.32376
Percentile Bootstrap UCL	4.404795
BCA Bootstrap UCL	5.400502
95% Chebyshev (Mean, Sd) UCL	7.572284
97.5% Chebyshev (Mean, Sd) UCL	9.895269
99% Chebyshev (Mean, Sd) UCL	14.45832

Data File	P:\W2-mfg\TEXTRON\GORHAM\Database\P	Variable:	Silver

Raw Statistics	
Number of Valid Samples	22
Number of Unique Samples	22
Minimum	0.37
Maximum	227
Mean	83.49386
Median	86.65
Standard Deviation	70.79663
Variance	5012.163
Coefficient of Variation	0.847926
Skewness	0.336967

Gamma Statistics	
k hat	0.680409
k star (bias corrected)	0.617929
Theta hat	122.7113
Theta star	135.1188
nu hat	29.938
nu star	27.18888
Approx.Chi Square Value (.05)	16.29605
Adjusted Level of Significance	0.0386
Adjusted Chi Square Value	15.66684

Log-transformed Statistics	
Minimum of log data	-0.994252
Maximum of log data	5.42495
Mean of log data	3.533021
Standard Deviation of log data	1.906617
Variance of log data	3.635187

RECOMMENDATION
Data are Non-parametric (0.05)
Use 99% Chebyshev (Mean, Sd) UCL

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.910023
Shapiro-Wilk 5% Critical Value	0.911
Data not normal at 5% significance level	
95% UCL (Assuming Normal Distribution)	
Student's-t UCL	109.4666
Gamma Distribution Test	
A-D Test Statistic	0.937458
A-D 5% Critical Value	0.788894
K-S Test Statistic	0.196429
K-S 5% Critical Value	0.193568
Data do not follow gamma distribution	
at 5% significance level	
95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	139.304
Adjusted Gamma UCL	144.8987
Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.832866
Shapiro-Wilk 5% Critical Value	0.911
Data not lognormal at 5% significance level	
95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	1090.38
95% Chebyshev (MVUE) UCL	559.6618
97.5% Chebyshev (MVUE) UCL	726.7163
99% Chebyshev (MVUE) UCL	1054.863
95% Non-parametric UCLs	
CLT UCL	108.3211
Adj-CLT UCL (Adjusted for skewness)	109.4798
Mod-t UCL (Adjusted for skewness)	109.6473
Jackknife UCL	109.4666
Standard Bootstrap UCL	107.6752
Bootstrap-t UCL	111.2924
Hall's Bootstrap UCL	107.7864
Percentile Bootstrap UCL	109.0739
BCA Bootstrap UCL	109.4064
95% Chebyshev (Mean, Sd) UCL	149.2866
97.5% Chebyshev (Mean, Sd) UCL	177.7552
99% Chebyshev (Mean, Sd) UCL	233.6762

Recommended UCL exceeds the maximum observation

Consider using 95% or 97.5% Chebyshev (Mean, Sd) UCL

Data File	P:\W2-mfg\TEXTRON\GORHAM\Database\F	Variable:	TEQ-M

Raw Statistics	
Number of Valid Samples	22
Number of Unique Samples	22
Minimum	8.53E-007
Maximum	0.003622
Mean	0.000647
Median	0.00018
Standard Deviation	0.000941
Variance	8.85E-007
Coefficient of Variation	1.453309
Skewness	1.873207

Gamma Statistics	
k hat	0.445963
k star (bias corrected)	0.415453
Theta hat	0.001451
Theta star	0.001558
nu hat	19.62238
nu star	18.27994
Approx.Chi Square Value (.05)	9.592085
Adjusted Level of Significance	0.0386
Adjusted Chi Square Value	9.12349

Log-transformed Statistics	
Minimum of log data	-13.97495
Maximum of log data	-5.620845
Mean of log data	-8.793
Standard Deviation of log data	2.164741
Variance of log data	4.686105

RECOMMENDATION
Data follow gamma distribution (0.05)
Use Adjusted Gamma UCL

Normal Distribution Test	
Shapiro-Wilk Test Statisitic	0.721804
Shapiro-Wilk 5% Critical Value	0.911
Data not normal at 5% significance level	
95% UCL (Assuming Normal Distribution)	
Student's-t UCL	0.000992

Gamma Distribution Test	
A-D Test Statistic	0.476634
A-D 5% Critical Value	0.815962
K-S Test Statistic	0.153936
K-S 5% Critical Value	0.197294
Data follow gamma distribution	
at 5% significance level	
95% UCLs (Assuming Gamma Distribution)	
Approximate Gamma UCL	0.001233
Adjusted Gamma UCL	0.001297

Lognormal Distribution Test	
Shapiro-Wilk Test Statisitic	0.949057
Shapiro-Wilk 5% Critical Value	0.911
Data are lognormal at 5% significance level	
95% UCLs (Assuming Lognormal Distribution)	
95% H-UCL	0.012562
95% Chebyshev (MVUE) UCL	0.00422
97.5% Chebyshev (MVUE) UCL	0.005531
99% Chebyshev (MVUE) UCL	0.008107

95% Non-parametric UCLs	
CLT UCL	0.000977
Adj-CLT UCL (Adjusted for skewness)	0.001063
Mod-t UCL (Adjusted for skewness)	0.001006
Jackknife UCL	0.000992
Standard Bootstrap UCL	0.000976
Bootstrap-t UCL	0.001144
Hall's Bootstrap UCL	0.001099
Percentile Bootstrap UCL	0.000975
BCA Bootstrap UCL	0.001049
95% Chebyshev (Mean, Sd) UCL	0.001521
97.5% Chebyshev (Mean, Sd) UCL	0.001899
99% Chebyshev (Mean, Sd) UCL	0.002642

APPENDIX D

Risk Calculation Spreadsheets

TABLE D1
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE- CURRENT/FUTURE- ADOLESCENT TRESPASSER- AGES 7-18
SUPPLEMENTAL SITE INVESTIGATION REPORT
FORMER GORHAM MANUFACTURING SITE
333 ADELAIDE AVENUE
PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: ADOLESCENT TRESPASSER
RECEPTOR AGE: AGES 7-18

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK (1)					NON-CARCINOGENIC HAZARD QUOTIENT (1)				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	INNER COVE	1,2-Dichloroethene (cis)	NC	NA	NC	NA		Hematological system	5.4E-03	NA		5.4E-03
			Butylbenzene, sec-	NC	NA	NC	NA		Undetermined	9.4E-07	NA		9.4E-07
			Tetrachloroethene	2.6E-07	NA	0.0E+00	NA	2.6E-07	Liver	2.8E-04	NA		2.8E-04
			Trichloroethene	8.6E-07	NA	0.0E+00	NA	8.6E-07	Liver/Kidney	4.2E-02	NA		4.2E-02
			Vinyl Chloride	1.1E-06	NA	0.0E+00	NA	1.1E-06	Liver	1.5E-03	NA		1.5E-03
			Benzo(a)anthracene	8.9E-08	NA	2.9E-08	NA	1.2E-07	Kidney	2.4E-05	NA	7.7E-06	3.1E-05
			Benzo(a)pyrene	6.1E-07	NA	2.0E-07	NA	8.1E-07	Kidney	1.6E-05	NA	5.3E-06	2.2E-05
			Benzo(b)fluoranthene	9.1E-08	NA	3.0E-08	NA	1.2E-07	Kidney	2.4E-05	NA	7.9E-06	3.2E-05
			Dibenzo(a,h)anthracene	7.4E-08	NA	2.4E-08	NA	9.8E-08	Kidney	2.0E-06	NA	6.4E-07	2.6E-06
			Indeno(1,2,3-cd)pyrene	1.9E-08	NA	6.1E-09	NA	2.5E-08	Kidney	5.0E-06	NA	1.6E-06	6.6E-06
			Aroclor 1254	1.5E-08	NA	5.3E-09	NA	2.1E-08	Immune system	2.2E-03	NA	7.8E-04	3.0E-03
			Arsenic	2.3E-06	NA	1.7E-07	NA	2.5E-06	Skin	3.0E-02	NA	2.2E-03	3.2E-02
			Cadmium (water)	NC	NA	NC	NA		Kidney	2.7E-03	NA	1.3E-04	2.8E-03
			Chromium VI (used as Total Chromium)	NC	NA	NC	NA		NOAEL	4.0E-02	NA		4.0E-02
			Copper	NC	NA	NC	NA			--	NA		
			Lead	--	NA	--	NA			--	NA		
			Mercury (as elemental mercury)	NC	NA	NC	NA		Immune system	8.8E-04	NA		8.8E-04
			Nickel	NC	NA	NC	NA		Decreased BW/Organ wt.	4.4E-03	NA		4.4E-03
			Silver	NC	NA	NC	NA		Skin	1.4E-02	NA		1.4E-02
			2,3,7,8-TCDD	1.0E-05	NA	2.6E-08	NA	1.0E-05		--	NA	--	
			CHEMICAL TOTAL	1.6E-05	--	4.9E-07	--	2E-05		1.4E-01	0.0E+00	3.2E-03	1E-01
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-05					1E-01
	EXPOSURE MEDIUM TOTAL							2E-05					1E-01
SURFACE WATER	SURFACE WATER	INNER COVE	1,2-Dichloroethene (cis)	NC	NA	NC	NA		Hematological system	1.1E-04	NA	--	1.1E-04
			Tetrachloroethene	1.3E-08	NA	1.4E-07	NA	1.5E-07	Liver	1.4E-05	NA	1.5E-04	1.6E-04
			Trichloroethene	2.4E-08	NA	7.1E-08	NA	9.5E-08	Liver, Kidney	1.1E-03	NA	3.5E-03	4.6E-03
			Vinyl Chloride	7.9E-08	NA	8.5E-08	NA	1.6E-07	Liver	1.1E-04	NA	1.2E-04	2.3E-04
			Lead	--	NA	--	NA			--	NA	--	
			CHEMICAL TOTAL	1.2E-07	--	3.0E-07	--	4E-07		1.4E-03	0.0E+00	3.7E-03	5E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						4E-07					5E-03
	EXPOSURE MEDIUM TOTAL							4E-07					5E-03
RECEPTOR TOTAL								**2E-05**					**2E-01**
							TOTAL RISK ACROSS ALL MEDIA	**2E-05**	**TOTAL HAZARD ACROSS ALL MEDIA**				**2E-01**

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: BJR
Checked by: KJC

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TOTAL HEMATOLOGICAL SYSTEM HI =	**5.5E-03**
TOTAL IMMUNE SYSTEM HI =	**3.9E-03**
TOTAL KIDNEY HI =	**2.9E-03**
TOTAL LIVER HI =	**2.2E-03**
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TOTAL NOAEL HI =	**4.0E-02**
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TOTAL SKIN HI =	**4.6E-02**
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TABLE D2
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE- CURRENT/FUTURE- ADULT TRESPASSER- AGES 19-30
SUPPLEMENTAL SITE INVESTIGATION REPORT
FORMER GORHAM MANUFACTURING SITE
333 ADELAIDE AVENUE
PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: ADULT TRESPASSER
RECEPTOR AGE: AGES 19-30

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK (1)					NON-CARCINOGENIC HAZARD QUOTIENT (1)				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	INNER COVE	1,2-Dichloroethene (cis)	NC	NA	NC	NA		Hematological system	3.4E-03	NA		3.4E-03
			Butylbenzene, sec-	NC	NA	NC	NA		Undetermined	6.0E-07	NA		6.0E-07
			Tetrachloroethene	1.7E-07	NA	0.0E+00	NA	1.7E-07	Liver	1.8E-04	NA		1.8E-04
			Trichloroethene	5.5E-07	NA	0.0E+00	NA	5.5E-07	Liver/Kidney	2.7E-02	NA		2.7E-02
			Vinyl Chloride	6.9E-07	NA	0.0E+00	NA	6.9E-07	Liver	9.6E-04	NA		9.6E-04
			Benzo(a)anthracene	5.7E-08	NA	2.5E-08	NA	8.2E-08	Kidney	1.5E-05	NA	6.7E-06	2.2E-05
			Benzo(a)pyrene	3.9E-07	NA	1.7E-07	NA	5.6E-07	Kidney	1.0E-05	NA	4.6E-06	1.5E-05
			Benzo(b)fluoranthene	5.8E-08	NA	2.6E-08	NA	8.4E-08	Kidney	1.6E-05	NA	6.9E-06	2.2E-05
			Dibenzo(a,h)anthracene	4.8E-08	NA	2.1E-08	NA	6.9E-08	Kidney	1.3E-06	NA	5.6E-07	1.8E-06
			Indeno(1,2,3-cd)pyrene	1.2E-08	NA	5.3E-09	NA	1.7E-08	Kidney	3.2E-06	NA	1.4E-06	4.6E-06
			Aroclor 1254	9.8E-09	NA	4.7E-09	NA	1.4E-08	Immune system	1.4E-03	NA	6.8E-04	2.1E-03
			Arsenic	1.5E-06	NA	1.5E-07	NA	1.6E-06	Skin	1.9E-02	NA	1.9E-03	2.1E-02
			Cadmium (water)	NC	NA	NC	NA		Kidney	1.7E-03	NA	1.2E-04	1.8E-03
			Chromium VI (used as Total Chromium)	NC	NA	NC	NA		NOAEL	2.6E-02	NA		2.6E-02
			Copper	NC	NA	NC	NA			--	NA		
			Lead	--	NA	--	NA			--	NA		
			Mercury (as elemental mercury)	NC	NA	NC	NA		Immune system	5.7E-04	NA		5.7E-04
			Nickel	NC	NA	NC	NA		Decreased BW/Organ wt	2.8E-03	NA		2.8E-03
			Silver	NC	NA	NC	NA		Skin	9.1E-03	NA		9.1E-03
			2,3,7,8-TCDD	6.7E-06	NA	2.3E-08	NA	6.7E-06		--	NA	--	
			CHEMICAL TOTAL	1.0E-05	--	4.3E-07	--	1E-05		9.2E-02	0.0E+00	2.8E-03	9E-02
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-05					9E-02
	EXPOSURE MEDIUM TOTAL							1E-05					9E-02
SURFACE WATER	SURFACE WATER	INNER COVE	1,2-Dichloroethene (cis)	NC	NA	NC	NA		Hematological system	6.9E-05	NA	--	6.9E-05
			Tetrachloroethene	8.3E-09	NA	1.2E-07	NA	1.3E-07	Liver	9.0E-06	NA	1.3E-04	1.4E-04
			Trichloroethene	1.5E-08	NA	6.2E-08	NA	7.8E-08	Liver, Kidney	7.4E-04	NA	3.0E-03	3.8E-03
			Vinyl Chloride	5.1E-08	NA	7.4E-08	NA	1.3E-07	Liver	7.1E-05	NA	1.0E-04	1.7E-04
			Lead	--	NA	--	NA			--	NA	--	
			CHEMICAL TOTAL	7.4E-08	--	2.6E-07	--	3E-07		8.8E-04	0.0E+00	3.3E-03	4E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						3E-07					4E-03
	EXPOSURE MEDIUM TOTAL							3E-07					4E-03
RECEPTOR TOTAL								1E-05					1E-01
							TOTAL RISK ACROSS ALL MEDIA	1E-05	TOTAL HAZARD ACROSS ALL MEDIA				1E-01

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: BJR
Checked by: KJC

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TOTAL HEMATOLOGICAL SYSTEM HI =	3.5E-03
TOTAL IMMUNE SYSTEM HI =	2.7E-03
TOTAL KIDNEY HI =	1.9E-03
TOTAL LIVER HI =	1.5E-03
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	--
TOTAL NOAEL HI =	2.6E-02
	--
TOTAL SKIN HI =	3.0E-02
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TABLE D3
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE- CURRENT/FUTURE- COMMERCIAL/INDUSTRIAL WORKER- ADULT
SUPPLEMENTAL SITE INVESTIGATION REPORT
FORMER GORHAM MANUFACTURING SITE
333 ADELAIDE AVENUE
PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: COMMERCIAL/INDUSTRIAL WORKER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK (1)					NON-CARCINOGENIC HAZARD QUOTIENT (1)				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	INNER COVE	1,2-Dichloroethene (cis)	NC	NA	NC	NA		Hematological system	5.7E-04	NA		5.7E-04
			Butylbenzene, sec-	NC	NA	NC	NA		Undetermined	1.0E-07	NA		1.0E-07
			Tetrachloroethene	5.8E-08	NA	0.0E+00	NA	5.8E-08	Liver	3.0E-05	NA		3.0E-05
			Trichloroethene	1.9E-07	NA	0.0E+00	NA	1.9E-07	Liver/Kidney	4.5E-03	NA		4.5E-03
			Vinyl Chloride	2.4E-07	NA	0.0E+00	NA	2.4E-07	Liver	1.6E-04	NA		1.6E-04
			Benzo(a)anthracene	2.0E-08	NA	5.0E-09	NA	2.5E-08	Kidney	2.5E-06	NA	6.4E-07	3.2E-06
			Benzo(a)pyrene	1.4E-07	NA	3.4E-08	NA	1.7E-07	Kidney	1.7E-06	NA	4.4E-07	2.2E-06
			Benzo(b)fluoranthene	2.0E-08	NA	5.1E-09	NA	2.5E-08	Kidney	2.6E-06	NA	6.6E-07	3.3E-06
			Dibenzo(a,h)anthracene	1.6E-08	NA	4.2E-09	NA	2.1E-08	Kidney	2.1E-07	NA	5.3E-08	2.6E-07
			Indeno(1,2,3-cd)pyrene	4.2E-09	NA	1.1E-09	NA	5.2E-09	Kidney	5.3E-07	NA	1.3E-07	6.7E-07
			Aroclor 1254	3.4E-09	NA	9.3E-10	NA	4.3E-09	Immune system	2.4E-04	NA	6.5E-05	3.0E-04
			Arsenic	5.1E-07	NA	3.0E-08	NA	5.4E-07	Skin	3.2E-03	NA	1.8E-04	3.4E-03
			Cadmium (water)	NC	NA	NC	NA		Kidney	2.9E-04	NA	1.1E-05	3.0E-04
			Chromium VI (used as Total Chromium)	NC	NA	NC	NA		NOAEL	4.3E-03	NA		4.3E-03
			Copper	NC	NA	NC	NA			--	NA		
			Lead	--	NA	--	NA			--	NA		
			Mercury (as elemental mercury)	NC	NA	NC	NA		Immune system	9.5E-05	NA		9.5E-05
			Nickel	NC	NA	NC	NA		Decreased BW/Organ wt.	4.7E-04	NA		4.7E-04
			Silver	NC	NA	NC	NA		Skin	1.5E-03	NA		1.5E-03
			2,3,7,8-TCDD	2.3E-06	NA	4.5E-09	NA	2.3E-06		--	NA	--	
			CHEMICAL TOTAL	3.5E-06	--	8.5E-08	--	4E-06		1.5E-02	0.0E+00	2.6E-04	2E-02
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						4E-06					2E-02
	EXPOSURE MEDIUM TOTAL							4E-06					2E-02
SURFACE WATER	SURFACE WATER	INNER COVE	1,2-Dichloroethene (cis)	NC	NA	NC	NA		Hematological system	1.7E-05	NA	--	1.7E-05
			Tetrachloroethene	4.3E-09	NA	3.7E-08	NA	4.1E-08	Liver	2.2E-06	NA	1.9E-05	2.1E-05
			Trichloroethene	7.9E-09	NA	1.9E-08	NA	2.7E-08	Liver, Kidney	1.8E-04	NA	4.4E-04	6.2E-04
			Vinyl Chloride	2.6E-08	NA	2.1E-08	NA	4.8E-08	Liver	1.8E-05	NA	1.4E-05	3.2E-05
			Lead	--	NA	--	NA			--	NA	--	
			CHEMICAL TOTAL	3.9E-08	--	7.7E-08	--	1E-07		2.2E-04	0.0E+00	4.7E-04	7E-04
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-07					7E-04
	EXPOSURE MEDIUM TOTAL							1E-07					7E-04
RECEPTOR TOTAL								**4E-06**					**2E-02**
							TOTAL RISK ACROSS ALL MEDIA	**4E-06**	**TOTAL HAZARD ACROSS ALL MEDIA**				**2E-02**

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: BJR
Checked by: KJC

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TOTAL HEMATOLOGICAL SYSTEM HI =	**5.9E-04**
TOTAL IMMUNE SYSTEM HI =	**4.0E-04**
TOTAL KIDNEY HI =	**3.1E-04**
TOTAL LIVER HI =	**2.4E-04**
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TOTAL NOAEL HI =	**4.3E-03**
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TOTAL SKIN HI =	**4.9E-03**
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TABLE D4
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE- CURRENT/FUTURE- ADOLESCENT TRESPASSER- AGES 7-18
SUPPLEMENTAL SITE INVESTIGATION REPORT
FORMER GORHAM MANUFACTURING SITE
333 ADELAIDE AVENUE
PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: ADOLESCENT TRESPASSER
RECEPTOR AGE: AGES 7-18

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK (1)					NON-CARCINOGENIC HAZARD QUOTIENT (1)				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	OUTER COVE	1,2-Dichloroethene (cis)	NC	NA	NC	NA		Hematological system	7.5E-08	NA		7.5E-08
			Butylbenzene, sec-	NC	NA	NC	NA		Undetermined	7.5E-08	NA		7.5E-08
			Tetrachloroethene	6.9E-11	NA	0.0E+00	NA	6.9E-11	Liver	7.5E-08	NA		7.5E-08
			Trichloroethene	5.1E-11	NA	0.0E+00	NA	5.1E-11	Liver/Kidney	2.5E-06	NA		2.5E-06
			Vinyl Chloride	3.6E-10	NA	0.0E+00	NA	3.6E-10	Liver	5.0E-07	NA		5.0E-07
			Benzo(a)anthracene	2.7E-08	NA	8.7E-09	NA	3.5E-08	Kidney	7.1E-06	NA	2.3E-06	9.4E-06
			Benzo(a)pyrene	3.3E-07	NA	1.1E-07	NA	4.4E-07	Kidney	8.9E-06	NA	2.9E-06	1.2E-05
			Benzo(b)fluoranthene	5.5E-08	NA	1.8E-08	NA	7.3E-08	Kidney	1.5E-05	NA	4.7E-06	1.9E-05
			Dibenzo(a,h)anthracene	3.1E-08	NA	1.0E-08	NA	4.2E-08	Kidney	8.4E-07	NA	2.7E-07	1.1E-06
			Indeno(1,2,3-cd)pyrene	1.0E-08	NA	3.3E-09	NA	1.3E-08	Kidney	2.7E-06	NA	8.7E-07	3.6E-06
			Aroclor 1254	4.1E-09	NA	1.4E-09	NA	5.5E-09	Immune system	6.0E-04	NA	2.1E-04	8.1E-04
			Arsenic	9.2E-07	NA	6.9E-08	NA	9.9E-07	Skin	1.2E-02	NA	8.9E-04	1.3E-02
			Cadmium (water)	NC	NA	NC	NA		Kidney	2.6E-04	NA	1.3E-05	2.7E-04
			Chromium VI (used as Total Chromium)	NC	NA	NC	NA		NOAEL	7.2E-04	NA		7.2E-04
			Copper	NC	NA	NC	NA			--	NA		
			Lead	--	NA	--	NA			--	NA		
			Mercury (as elemental mercury)	NC	NA	NC	NA		Immune system	2.5E-05	NA		2.5E-05
			Nickel	NC	NA	NC	NA		Decreased BW/Organ wt.	3.5E-04	NA		3.5E-04
			Silver	NC	NA	NC	NA		Skin	2.6E-05	NA		2.6E-05
			2,3,7,8-TCDD	9.0E-08	NA	2.3E-10	NA	9.1E-08		--	NA	--	
			CHEMICAL TOTAL	1.5E-06	--	2.2E-07	--	2E-06		1.4E-02	0.0E+00	1.1E-03	2E-02
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-06					2E-02
	EXPOSURE MEDIUM TOTAL							2E-06					2E-02
SURFACE WATER	SURFACE WATER	OUTER COVE	1,2-Dichloroethene (cis)	NC	NA	NC	NA		Hematological system	2.2E-04	NA	--	2.2E-04
			Tetrachloroethene	9.6E-09	NA	1.0E-07	NA	1.1E-07	Liver	1.0E-05	NA	1.1E-04	1.2E-04
			Trichloroethene	3.3E-08	NA	9.9E-08	NA	1.3E-07	Liver, Kidney	1.6E-03	NA	4.8E-03	6.4E-03
			Vinyl Chloride	2.5E-08	NA	2.7E-08	NA	5.1E-08	Liver	3.5E-05	NA	3.7E-05	7.2E-05
			Lead	--	NA	--	NA			--	NA	--	
			CHEMICAL TOTAL	6.7E-08	--	2.3E-07	--	3E-07		1.9E-03	0.0E+00	4.9E-03	7E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						3E-07					7E-03
	EXPOSURE MEDIUM TOTAL							3E-07					7E-03
RECEPTOR TOTAL								**2E-06**					**2E-02**
							TOTAL RISK ACROSS ALL MEDIA	**2E-06**	**TOTAL HAZARD ACROSS ALL MEDIA**				**2E-02**

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: BJR
Checked by: KJC

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TOTAL HEMATOLOGICAL SYSTEM HI =	**2.2E-04**
TOTAL IMMUNE SYSTEM HI =	**8.3E-04**
TOTAL KIDNEY HI =	**3.2E-04**
TOTAL LIVER HI =	**1.9E-04**
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TOTAL NOAEL HI =	**7.2E-04**
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TOTAL SKIN HI =	**1.3E-02**
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TABLE D5
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE- CURRENT/FUTURE- ADULT TRESPASSER- AGES 19-30
SUPPLEMENTAL SITE INVESTIGATION REPORT
FORMER GORHAM MANUFACTURING SITE
333 ADELAIDE AVENUE
PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: ADULT TRESPASSER
RECEPTOR AGE: AGES 19-30

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK (1)					NON-CARCINOGENIC HAZARD QUOTIENT (1)				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	OUTER COVE	1,2-Dichloroethene (cis)	NC	NA	NC	NA		Hematological system	4.8E-08	NA		4.8E-08
			Butylbenzene, sec-	NC	NA	NC	NA		Undetermined	4.8E-08	NA		4.8E-08
			Tetrachloroethene	4.5E-11	NA	0.0E+00	NA	4.5E-11	Liver	4.8E-08	NA		4.8E-08
			Trichloroethene	3.3E-11	NA	0.0E+00	NA	3.3E-11	Liver/Kidney	1.6E-06	NA		1.6E-06
			Vinyl Chloride	2.3E-10	NA	0.0E+00	NA	2.3E-10	Liver	3.2E-07	NA		3.2E-07
			Benzo(a)anthracene	1.7E-08	NA	7.6E-09	NA	2.5E-08	Kidney	4.6E-06	NA	2.0E-06	6.6E-06
			Benzo(a)pyrene	2.2E-07	NA	9.5E-08	NA	3.1E-07	Kidney	5.7E-06	NA	2.5E-06	8.3E-06
			Benzo(b)fluoranthene	3.5E-08	NA	1.6E-08	NA	5.1E-08	Kidney	9.4E-06	NA	4.1E-06	1.4E-05
			Dibenzo(a,h)anthracene	2.0E-08	NA	8.9E-09	NA	2.9E-08	Kidney	5.4E-07	NA	2.4E-07	7.7E-07
			Indeno(1,2,3-cd)pyrene	6.5E-09	NA	2.9E-09	NA	9.3E-09	Kidney	1.7E-06	NA	7.6E-07	2.5E-06
			Aroclor 1254	2.6E-09	NA	1.3E-09	NA	3.9E-09	Immune system	3.8E-04	NA	1.8E-04	5.7E-04
			Arsenic	5.9E-07	NA	6.0E-08	NA	6.5E-07	Skin	7.7E-03	NA	7.8E-04	8.4E-03
			Cadmium (water)	NC	NA	NC	NA		Kidney	1.7E-04	NA	1.1E-05	1.8E-04
			Chromium VI (used as Total Chromium)	NC	NA	NC	NA		NOAEL	4.7E-04	NA		4.7E-04
			Copper	NC	NA	NC	NA			--	NA		
			Lead	--	NA	--	NA			--	NA		
			Mercury (as elemental mercury)	NC	NA	NC	NA		Immune system	1.6E-05	NA		1.6E-05
			Nickel	NC	NA	NC	NA		Decreased BW/Organ wt.	2.2E-04	NA		2.2E-04
			Silver	NC	NA	NC	NA		Skin	1.7E-05	NA		1.7E-05
			2,3,7,8-TCDD	5.8E-08	NA	2.0E-10	NA	5.8E-08		--	NA	--	
			CHEMICAL TOTAL	9.5E-07	--	1.9E-07	--	1E-06		8.9E-03	0.0E+00	9.9E-04	1E-02
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-06					1E-02
	EXPOSURE MEDIUM TOTAL							1E-06					1E-02
SURFACE WATER	SURFACE WATER	OUTER COVE	1,2-Dichloroethene (cis)	NC	NA	NC	NA		Hematological system	1.4E-04	NA	--	1.4E-04
			Tetrachloroethene	6.2E-09	NA	9.1E-08	NA	9.7E-08	Liver	6.7E-06	NA	9.8E-05	1.1E-04
			Trichloroethene	2.1E-08	NA	8.7E-08	NA	1.1E-07	Liver, Kidney	1.0E-03	NA	4.2E-03	5.2E-03
			Vinyl Chloride	1.6E-08	NA	2.3E-08	NA	3.9E-08	Liver	2.2E-05	NA	3.2E-05	5.5E-05
			Lead	--	NA	--	NA			--	NA	--	
			CHEMICAL TOTAL	4.3E-08	--	2.0E-07	--	2E-07		1.2E-03	0.0E+00	4.3E-03	6E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-07					6E-03
	EXPOSURE MEDIUM TOTAL							2E-07					6E-03
RECEPTOR TOTAL								**1E-06**					**2E-02**
							TOTAL RISK ACROSS ALL MEDIA	**1E-06**	**TOTAL HAZARD ACROSS ALL MEDIA**				**2E-02**

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: BJR
Checked by: KJC

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TOTAL HEMATOLOGICAL SYSTEM HI =	**1.4E-04**
TOTAL IMMUNE SYSTEM HI =	**5.8E-04**
TOTAL KIDNEY HI =	**2.1E-04**
TOTAL LIVER HI =	**1.6E-04**
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TOTAL NOAEL HI =	**4.7E-04**
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TOTAL SKIN HI =	**8.4E-03**
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TABLE D6
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE- CURRENT/FUTURE- COMMERCIAL/INDUSTRIAL WORKER- ADULT
SUPPLEMENTAL SITE INVESTIGATION REPORT
FORMER GORHAM MANUFACTURING SITE
333 ADELAIDE AVENUE
PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: COMMERCIAL/INDUSTRIAL WORKER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK (1)					NON-CARCINOGENIC HAZARD QUOTIENT (1)				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	OUTER COVE	1,2-Dichloroethene (cis)	NC	NA	NC	NA		Hematological system	8.0E-09	NA		8.0E-09
			Butylbenzene, sec-	NC	NA	NC	NA		Undetermined	8.0E-09	NA		8.0E-09
			Tetrachloroethene	1.6E-11	NA	0.0E+00	NA	1.6E-11	Liver	8.0E-09	NA		8.0E-09
			Trichloroethene	1.1E-11	NA	0.0E+00	NA	1.1E-11	Liver/Kidney	2.7E-07	NA		2.7E-07
			Vinyl Chloride	8.1E-11	NA	0.0E+00	NA	8.1E-11	Liver	5.4E-08	NA		5.4E-08
			Benzo(a)anthracene	5.9E-09	NA	1.5E-09	NA	7.4E-09	Kidney	7.6E-07	NA	1.9E-07	9.5E-07
			Benzo(a)pyrene	7.5E-08	NA	1.9E-08	NA	9.4E-08	Kidney	9.6E-07	NA	2.4E-07	1.2E-06
			Benzo(b)fluoranthene	1.2E-08	NA	3.1E-09	NA	1.5E-08	Kidney	1.6E-06	NA	4.0E-07	2.0E-06
			Dibenzo(a,h)anthracene	7.0E-09	NA	1.8E-09	NA	8.8E-09	Kidney	8.9E-08	NA	2.3E-08	1.1E-07
			Indeno(1,2,3-cd)pyrene	2.2E-09	NA	5.7E-10	NA	2.8E-09	Kidney	2.9E-07	NA	7.3E-08	3.6E-07
			Aroclor 1254	9.2E-10	NA	2.5E-10	NA	1.2E-09	Immune system	6.4E-05	NA	1.7E-05	8.2E-05
			Arsenic	2.0E-07	NA	1.2E-08	NA	2.2E-07	Skin	1.3E-03	NA	7.4E-05	1.3E-03
			Cadmium (water)	NC	NA	NC	NA		Kidney	2.8E-05	NA	1.1E-06	2.9E-05
			Chromium VI (used as Total Chromium)	NC	NA	NC	NA		NOAEL	7.8E-05	NA		7.8E-05
			Copper	NC	NA	NC	NA			--	NA		
			Lead	--	NA	--	NA			--	NA		
			Mercury (as elemental mercury)	NC	NA	NC	NA		Immune system	2.6E-06	NA		2.6E-06
			Nickel	NC	NA	NC	NA		Decreased BW/Organ wt.	3.7E-05	NA		3.7E-05
			Silver	NC	NA	NC	NA		Skin	2.8E-06	NA		2.8E-06
			2,3,7,8-TCDD	2.0E-08	NA	3.9E-11	NA	2.0E-08		--	NA	--	
			CHEMICAL TOTAL	3.3E-07	--	3.8E-08	--	4E-07		1.5E-03	0.0E+00	9.4E-05	2E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						4E-07					2E-03
	EXPOSURE MEDIUM TOTAL							4E-07					2E-03
SURFACE WATER	SURFACE WATER	OUTER COVE	1,2-Dichloroethene (cis)	NC	NA	NC	NA		Hematological system	3.6E-05	NA	--	3.6E-05
			Tetrachloroethene	3.2E-09	NA	2.7E-08	NA	3.1E-08	Liver	1.7E-06	NA	1.4E-05	1.6E-05
			Trichloroethene	1.1E-08	NA	2.6E-08	NA	3.7E-08	Liver, Kidney	2.6E-04	NA	6.1E-04	8.6E-04
			Vinyl Chloride	8.3E-09	NA	6.6E-09	NA	1.5E-08	Liver	5.5E-06	NA	4.4E-06	1.0E-05
			Lead	--	NA	--	NA			--	NA	--	
			CHEMICAL TOTAL	2.2E-08	--	6.0E-08	--	8E-08		3.0E-04	0.0E+00	6.3E-04	9E-04
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						8E-08					9E-04
	EXPOSURE MEDIUM TOTAL							8E-08					9E-04
RECEPTOR TOTAL								4E-07					3E-03
			TOTAL RISK ACROSS ALL MEDIA					4E-07	**TOTAL HAZARD ACROSS ALL MEDIA**				3E-03

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: BJR
Checked by: KJC

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TOTAL HEMATOLOGICAL SYSTEM HI =	**3.6E-05**
TOTAL IMMUNE SYSTEM HI =	**8.4E-05**
TOTAL KIDNEY HI =	**3.3E-05**
TOTAL LIVER HI =	**2.6E-05**
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TOTAL NOAEL HI =	**7.8E-05**
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TOTAL SKIN HI =	**1.4E-03**
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TABLE D7
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY- CURRENT/FUTURE- ADOLESCENT TRESPASSER- AGES 7-18
SUPPLEMENTAL SITE INVESTIGATION REPORT
FORMER GORHAM MANUFACTURING SITE
333 ADELAIDE AVENUE
PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: ADOLESCENT TRESPASSER
RECEPTOR AGE: AGES 7-18

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK (1)					NON-CARCINOGENIC HAZARD QUOTIENT (1)				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	INNER COVE	1,2-Dichloroethene (cis)	NC	NA	NC	NA		Hematological system	2.8E-04	NA		2.8E-04
			Butylbenzene, sec-	NC	NA	NC	NA		Undetermined	6.3E-07	NA		6.3E-07
			Tetrachloroethene	4.3E-09	NA	0.0E+00	NA	4.3E-09	Liver	1.9E-05	NA		1.9E-05
			Trichloroethene	1.3E-08	NA	0.0E+00	NA	1.3E-08	Liver/Kidney	2.6E-03	NA		2.6E-03
			Vinyl Chloride	2.7E-08	NA	0.0E+00	NA	2.7E-08	Liver	1.5E-04	NA		1.5E-04
			Benzo(a)anthracene	7.0E-09	NA	2.3E-09	NA	9.2E-09	Kidney	7.4E-06	NA	2.4E-06	9.8E-06
			Benzo(a)pyrene	4.4E-08	NA	1.4E-08	NA	5.8E-08	Kidney	4.7E-06	NA	1.5E-06	6.2E-06
			Benzo(b)fluoranthene	7.7E-09	NA	2.5E-09	NA	1.0E-08	Kidney	8.2E-06	NA	2.7E-06	1.1E-05
			Dibenzo(a,h)anthracene	7.4E-09	NA	2.4E-09	NA	9.8E-09	Kidney	7.9E-07	NA	2.6E-07	1.0E-06
			Indeno(1,2,3-cd)pyrene	1.6E-09	NA	5.1E-10	NA	2.1E-09	Kidney	1.7E-06	NA	5.4E-07	2.2E-06
			Aroclor 1254	1.7E-09	NA	6.1E-10	NA	2.4E-09	Immune system	1.0E-03	NA	3.6E-04	1.4E-03
			Arsenic	2.4E-07	NA	1.8E-08	NA	2.6E-07	Skin	1.2E-02	NA	9.3E-04	1.3E-02
			Cadmium (water)	NC	NA	NC	NA		Kidney	1.2E-03	NA	6.1E-05	1.3E-03
			Chromium VI (used as Total Chromium)	NC	NA	NC	NA		NOAEL	1.6E-02	NA		1.6E-02
			Copper	NC	NA	NC	NA			--	NA		
			Lead	--	NA	--	NA			--	NA		
			Mercury (as elemental mercury)	NC	NA	NC	NA		Immune system	3.5E-04	NA		3.5E-04
			Nickel	NC	NA	NC	NA		Decreased BW/Organ wt.	1.7E-03	NA		1.7E-03
			Silver	NC	NA	NC	NA		Skin	3.5E-03	NA		3.5E-03
			2,3,7,8-TCDD	8.6E-07	NA	2.2E-09	NA	8.6E-07		--	NA	--	
			CHEMICAL TOTAL	1.2E-06	--	4.3E-08	--	1E-06		3.9E-02	0.0E+00	1.4E-03	4E-02
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-06					4E-02
	EXPOSURE MEDIUM TOTAL							1E-06					4E-02
SURFACE WATER	SURFACE WATER	INNER COVE	1,2-Dichloroethene (cis)	NC	NA	NC	NA		Hematological system	7.1E-05	NA	--	7.1E-05
			Tetrachloroethene	2.0E-09	NA	2.6E-08	NA	2.8E-08	Liver	8.7E-06	NA	1.1E-04	1.2E-04
			Trichloroethene	3.5E-09	NA	1.3E-08	NA	1.6E-08	Liver, Kidney	6.9E-04	NA	2.5E-03	3.2E-03
			Vinyl Chloride	1.2E-08	NA	1.6E-08	NA	2.8E-08	Liver	6.9E-05	NA	8.9E-05	1.6E-04
			Lead	--	NA	--	NA			--	NA	--	
			CHEMICAL TOTAL	1.8E-08	--	5.4E-08	--	7E-08		8.4E-04	0.0E+00	2.7E-03	4E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						7E-08					4E-03
	EXPOSURE MEDIUM TOTAL							7E-08					4E-03
RECEPTOR TOTAL								1E-06					4E-02
			TOTAL RISK ACROSS ALL MEDIA					1E-06	**TOTAL HAZARD ACROSS ALL MEDIA**				4E-02

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: BJR
Checked by: KJC

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TOTAL HEMATOLOGICAL SYSTEM HI =	**3.5E-04**
TOTAL IMMUNE SYSTEM HI =	**1.7E-03**
TOTAL KIDNEY HI =	**1.3E-03**
TOTAL LIVER HI =	**4.5E-04**
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TOTAL NOAEL HI =	**1.6E-02**
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TOTAL SKIN HI =	**1.7E-02**
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TABLE D8
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY- CURRENT/FUTURE- ADULT TRESPASSER- AGES 19-30
SUPPLEMENTAL SITE INVESTIGATION REPORT
FORMER GORHAM MACUFACTURING SITE
333 ADELAIDE AVENUE
PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: ADULT TRESPASSER
RECEPTOR AGE: AGES 19-30

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK (1)					NON-CARCINOGENIC HAZARD QUOTIENT (1)				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	INNER COVE	1,2-Dichloroethene (cis)	NC	NA	NC	NA		Hematological system	1.8E-04	NA		1.8E-04
			Butylbenzene, sec-	NC	NA	NC	NA		Undetermined	4.0E-07	NA		4.0E-07
			Tetrachloroethene	3.7E-09	NA	0.0E+00	NA	3.7E-09	Liver	1.2E-05	NA		1.2E-05
			Trichloroethene	1.1E-08	NA	0.0E+00	NA	1.1E-08	Liver/Kidney	1.7E-03	NA		1.7E-03
			Vinyl Chloride	2.3E-08	NA	0.0E+00	NA	2.3E-08	Liver	9.8E-05	NA		9.8E-05
			Benzo(a)anthracene	6.0E-09	NA	2.6E-09	NA	8.6E-09	Kidney	4.8E-06	NA	2.1E-06	6.9E-06
			Benzo(a)pyrene	3.8E-08	NA	1.7E-08	NA	5.4E-08	Kidney	3.0E-06	NA	1.3E-06	4.3E-06
			Benzo(b)fluoranthene	6.6E-09	NA	2.9E-09	NA	9.5E-09	Kidney	5.3E-06	NA	2.3E-06	7.6E-06
			Dibenzo(a,h)anthracene	6.3E-09	NA	2.8E-09	NA	9.1E-09	Kidney	5.1E-07	NA	2.2E-07	7.3E-07
			Indeno(1,2,3-cd)pyrene	1.3E-09	NA	5.9E-10	NA	1.9E-09	Kidney	1.1E-06	NA	4.8E-07	1.5E-06
			Aroclor 1254	1.5E-09	NA	7.1E-10	NA	2.2E-09	Immune system	6.5E-04	NA	3.1E-04	9.7E-04
			Arsenic	2.0E-07	NA	2.1E-08	NA	2.2E-07	Skin	7.9E-03	NA	8.1E-04	8.7E-03
			Cadmium (water)	NC	NA	NC	NA		Kidney	7.8E-04	NA	5.3E-05	8.4E-04
			Chromium VI (used as Total Chromium)	NC	NA	NC	NA		NOAEL	1.0E-02	NA		1.0E-02
			Copper	NC	NA	NC	NA			--	NA		
			Lead	--	NA	--	NA			--	NA		
			Mercury (as elemental mercury)	NC	NA	NC	NA		Immune system	2.2E-04	NA		2.2E-04
			Nickel	NC	NA	NC	NA		Decreased BW/Organ wt.	1.1E-03	NA		1.1E-03
			Silver	NC	NA	NC	NA		Skin	2.2E-03	NA		2.2E-03
			2,3,7,8-TCDD	7.4E-07	NA	2.5E-09	NA	7.4E-07		--	NA	--	
			CHEMICAL TOTAL	1.0E-06	--	5.0E-08	--	1E-06		2.5E-02	0.0E+00	1.2E-03	3E-02
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-06					3E-02
	EXPOSURE MEDIUM TOTAL							1E-06					3E-02
SURFACE WATER	SURFACE WATER	INNER COVE	1,2-Dichloroethene (cis)	NC	NA	NC	NA		Hematological system	4.6E-05	NA	--	4.6E-05
			Tetrachloroethene	1.7E-09	NA	3.0E-08	NA	3.2E-08	Liver	5.6E-06	NA	9.7E-05	1.0E-04
			Trichloroethene	3.0E-09	NA	1.5E-08	NA	1.8E-08	Liver, Kidney	4.4E-04	NA	2.2E-03	2.7E-03
			Vinyl Chloride	1.1E-08	NA	1.9E-08	NA	2.9E-08	Liver	4.4E-05	NA	7.8E-05	1.2E-04
			Lead	--	NA	--	NA			--	NA	--	
			CHEMICAL TOTAL	1.5E-08	--	6.4E-08	--	8E-08		5.4E-04	0.0E+00	2.4E-03	3E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						8E-08					3E-03
	EXPOSURE MEDIUM TOTAL							8E-08					3E-03
RECEPTOR TOTAL								**1E-06**					**3E-02**
			TOTAL RISK ACROSS ALL MEDIA					**1E-06**	**TOTAL HAZARD ACROSS ALL MEDIA**				**3E-02**

NOTES:
NC - Not carcinogenic by this exposure route
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: BJR
Checked by: KJC

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TOTAL HEMATOLOGICAL SYSTEM HI =	2.3E-04
TOTAL IMMUNE SYSTEM HI =	1.2E-03
TOTAL KIDNEY HI =	8.6E-04
TOTAL LIVER HI =	3.3E-04
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TOTAL NOAEL HI =	1.0E-02
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TOTAL SKIN HI =	1.1E-02
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TABLE D9
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY- CURRENT/FUTURE- COMMERCIAL/INDUSTRIAL WORKER- ADULT
SUPPLEMENTAL SITE INVESTIGATION REPORT
FORMER GORHAM MANUFACTURING SITE
333 ADELAIDE AVENUE
PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: COMMERCIAL/INDUSTRIAL WORKER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK (1)					NON-CARCINOGENIC HAZARD QUOTIENT (1)				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	INNER COVE	1,2-Dichloroethene (cis)	NC	NA	NC	NA		Hematological system	2.3E-05	NA		2.3E-05
			Butylbenzene, sec-	NC	NA	NC	NA		Undetermined	5.0E-08	NA		5.0E-08
			Tetrachloroethene	1.5E-09	NA	0.0E+00	NA	1.5E-09	Liver	1.5E-06	NA		1.5E-06
			Trichloroethene	4.4E-09	NA	0.0E+00	NA	4.4E-09	Liver/Kidney	2.1E-04	NA		2.1E-04
			Vinyl Chloride	9.2E-09	NA	0.0E+00	NA	9.2E-09	Liver	1.2E-05	NA		1.2E-05
			Benzo(a)anthracene	2.3E-09	NA	5.9E-10	NA	2.9E-09	Kidney	6.0E-07	NA	1.5E-07	7.5E-07
			Benzo(a)pyrene	1.5E-08	NA	3.7E-09	NA	1.8E-08	Kidney	3.8E-07	NA	9.5E-08	4.7E-07
			Benzo(b)fluoranthene	2.6E-09	NA	6.5E-10	NA	3.2E-09	Kidney	6.6E-07	NA	1.7E-07	8.2E-07
			Dibenzo(a,h)anthracene	2.5E-09	NA	6.2E-10	NA	3.1E-09	Kidney	6.3E-08	NA	1.6E-08	7.9E-08
			Indeno(1,2,3-cd)pyrene	5.3E-10	NA	1.3E-10	NA	6.6E-10	Kidney	1.3E-07	NA	3.4E-08	1.7E-07
			Aroclor 1254	5.8E-10	NA	1.6E-10	NA	7.4E-10	Immune system	8.2E-05	NA	2.2E-05	1.0E-04
			Arsenic	8.0E-08	NA	4.6E-09	NA	8.4E-08	Skin	9.9E-04	NA	5.8E-05	1.0E-03
			Cadmium (water)	NC	NA	NC	NA		Kidney	9.8E-05	NA	3.8E-06	1.0E-04
			Chromium VI (used as Total Chromium)	NC	NA	NC	NA		NOAEL	1.3E-03	NA		1.3E-03
			Copper	NC	NA	NC	NA			--	NA		
			Lead	--	NA	--	NA			--	NA		
			Mercury (as elemental mercury)	NC	NA	NC	NA		Immune system	2.8E-05	NA		2.8E-05
			Nickel	NC	NA	NC	NA		Decreased BW/Organ wt.	1.3E-04	NA		1.3E-04
			Silver	NC	NA	NC	NA		Skin	2.8E-04	NA		2.8E-04
			2,3,7,8-TCDD	2.9E-07	NA	5.6E-10	NA	2.9E-07		--	NA	--	
			CHEMICAL TOTAL	4.1E-07	--	1.1E-08	--	4E-07		3.1E-03	0.0E+00	8.4E-05	3E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						4E-07					3E-03
	EXPOSURE MEDIUM TOTAL							4E-07					3E-03
SURFACE WATER	SURFACE WATER	INNER COVE	1,2-Dichloroethene (cis)	NC	NA	NC	NA		Hematological system	3.8E-06	NA	--	3.8E-06
			Tetrachloroethene	9.0E-10	NA	3.1E-08	NA	3.2E-08	Liver	4.6E-07	NA	1.6E-05	1.6E-05
			Trichloroethene	1.6E-09	NA	1.5E-08	NA	1.7E-08	Liver, Kidney	3.7E-05	NA	3.5E-04	3.9E-04
			Vinyl Chloride	5.5E-09	NA	1.8E-08	NA	2.3E-08	Liver	3.7E-06	NA	1.2E-05	1.5E-05
			Lead	--	NA	--	NA			--	NA	--	
			CHEMICAL TOTAL	8.0E-09	--	6.3E-08	--	7E-08		4.5E-05	0.0E+00	3.8E-04	4E-04
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						7E-08					4E-04
	EXPOSURE MEDIUM TOTAL							7E-08					4E-04
RECEPTOR TOTAL								**5E-07**					**4E-03**
							TOTAL RISK ACROSS ALL MEDIA	**5E-07**	**TOTAL HAZARD ACROSS ALL MEDIA**				**4E-03**

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: BJR
Checked by: KJC

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TOTAL HEMATOLOGICAL SYSTEM HI =	2.7E-05
TOTAL IMMUNE SYSTEM HI =	1.3E-04
TOTAL KIDNEY HI =	1.0E-04
TOTAL LIVER HI =	4.5E-05
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TOTAL NOAEL HI =	1.3E-03
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TOTAL SKIN HI =	1.3E-03
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TABLE D10
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY- CURRENT/FUTURE- ADOLESCENT TRESPASSER- AGES 7-18
SUPPLEMENTAL SITE INVESTIGATION REPORT
FORMER GORHAM MANUFACTURING SITE
333 ADELAIDE AVENUE
PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: ADOLESCENT TRESPASSER
RECEPTOR AGE: AGES 7-18

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK (1)					NON-CARCINOGENIC HAZARD QUOTIENT (1)				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	OUTER COVE	1,2-Dichloroethene (cis)	NC	NA	NC	NA		Hematological system	5.0E-08	NA		5.0E-08
			Butylbenzene, sec-	NC	NA	NC	NA		Undetermined	5.0E-08	NA		5.0E-08
			Tetrachloroethene	1.2E-11	NA	0.0E+00	NA	1.2E-11	Liver	5.0E-08	NA		5.0E-08
			Trichloroethene	8.6E-12	NA	0.0E+00	NA	8.6E-12	Liver/Kidney	1.7E-06	NA		1.7E-06
			Vinyl Chloride	6.0E-11	NA	0.0E+00	NA	6.0E-11	Liver	3.3E-07	NA		3.3E-07
			Benzo(a)anthracene	1.5E-09	NA	5.0E-10	NA	2.0E-09	Kidney	1.6E-06	NA	5.4E-07	2.2E-06
			Benzo(a)pyrene	1.9E-08	NA	6.3E-09	NA	2.6E-08	Kidney	2.1E-06	NA	6.7E-07	2.7E-06
			Benzo(b)fluoranthene	3.2E-09	NA	1.0E-09	NA	4.2E-09	Kidney	3.4E-06	NA	1.1E-06	4.5E-06
			Dibenzo(a,h)anthracene	2.4E-09	NA	7.9E-10	NA	3.2E-09	Kidney	2.6E-07	NA	8.4E-08	3.4E-07
			Indeno(1,2,3-cd)pyrene	6.3E-10	NA	2.0E-10	NA	8.3E-10	Kidney	6.7E-07	NA	2.2E-07	8.8E-07
			Aroclor 1254	6.8E-10	NA	2.4E-10	NA	9.2E-10	Immune system	4.0E-04	NA	1.4E-04	5.4E-04
			Arsenic	5.8E-08	NA	4.4E-09	NA	6.3E-08	Skin	3.0E-03	NA	2.3E-04	3.3E-03
			Cadmium (water)	NC	NA	NC	NA		Kidney	1.7E-04	NA	8.7E-06	1.8E-04
			Chromium VI (used as Total Chromium)	NC	NA	NC	NA		NOAEL	3.4E-04	NA		3.4E-04
			Copper	NC	NA	NC	NA			--	NA		
			Lead	--	NA	--	NA			--	NA		
			Mercury (as elemental mercury)	NC	NA	NC	NA		Immune system	1.6E-05	NA		1.6E-05
			Nickel	NC	NA	NC	NA		Decreased BW/Organ wt.	1.0E-04	NA		1.0E-04
			Silver	NC	NA	NC	NA		Skin	1.7E-05	NA		1.7E-05
			2,3,7,8-TCDD	6.0E-09	NA	1.5E-11	NA	6.0E-09		--	NA	--	
			CHEMICAL TOTAL	9.2E-08	--	1.3E-08	--	1E-07		4.1E-03	0.0E+00	3.8E-04	4E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-07					4E-03
	EXPOSURE MEDIUM TOTAL							1E-07					4E-03
SURFACE WATER	SURFACE WATER	OUTER COVE	1,2-Dichloroethene (cis)	NC	NA	NC	NA		Hematological system	7.5E-05	NA	--	7.5E-05
			Tetrachloroethene	1.8E-09	NA	2.3E-08	NA	2.5E-08	Liver	7.8E-06	NA	9.9E-05	1.1E-04
			Trichloroethene	2.9E-09	NA	1.1E-08	NA	1.4E-08	Liver, Kidney	5.7E-04	NA	2.1E-03	2.6E-03
			Vinyl Chloride	4.7E-09	NA	6.0E-09	NA	1.1E-08	Liver	2.6E-05	NA	3.4E-05	5.9E-05
			Lead	--	NA	--	NA			--	NA	--	
			CHEMICAL TOTAL	9.4E-09	--	4.0E-08	--	5E-08		6.8E-04	0.0E+00	2.2E-03	3E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						5E-08					3E-03
	EXPOSURE MEDIUM TOTAL							5E-08					3E-03
RECEPTOR TOTAL								**2E-07**					**7E-03**
							TOTAL RISK ACROSS ALL MEDIA	**2E-07**	**TOTAL HAZARD ACROSS ALL MEDIA**				**7E-03**

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: BJR
Checked by: KJC

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TOTAL HEMATOLOGICAL SYSTEM HI =	7.5E-05
TOTAL IMMUNE SYSTEM HI =	5.5E-04
TOTAL KIDNEY HI =	1.9E-04
TOTAL LIVER HI =	1.7E-04
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TOTAL NOAEL HI =	3.4E-04
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TOTAL SKIN HI =	3.3E-03
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TABLE D11
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY- CURRENT/FUTURE- ADULT TRESPASSER- AGES 19-30
SUPPLEMENTAL SITE INVESTIGATION REPORT
FORMER GORHAM MANUFACTURING SITE
333 ADELAIDE AVENUE
PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: ADULT TRESPASSER
RECEPTOR AGE: AGES 19-30

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK (1)					NON-CARCINOGENIC HAZARD QUOTIENT (1)				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	OUTER COVE	1,2-Dichloroethene (cis)	NC	NA	NC	NA		Hematological system	3.2E-08	NA		3.2E-08
			Butylbenzene, sec-	NC	NA	NC	NA		Undetermined	3.2E-08	NA		3.2E-08
			Tetrachloroethene	9.9E-12	NA	0.0E+00	NA	9.9E-12	Liver	3.2E-08	NA		3.2E-08
			Trichloroethene	7.4E-12	NA	0.0E+00	NA	7.4E-12	Liver/Kidney	1.1E-06	NA		1.1E-06
			Vinyl Chloride	5.2E-11	NA	0.0E+00	NA	5.2E-11	Liver	2.2E-07	NA		2.2E-07
			Benzo(a)anthracene	1.3E-09	NA	5.9E-10	NA	1.9E-09	Kidney	1.1E-06	NA	4.7E-07	1.5E-06
			Benzo(a)pyrene	1.7E-08	NA	7.3E-09	NA	2.4E-08	Kidney	1.3E-06	NA	5.8E-07	1.9E-06
			Benzo(b)fluoranthene	2.7E-09	NA	1.2E-09	NA	3.9E-09	Kidney	2.2E-06	NA	9.6E-07	3.1E-06
			Dibenzo(a,h)anthracene	2.1E-09	NA	9.2E-10	NA	3.0E-09	Kidney	1.7E-07	NA	7.3E-08	2.4E-07
			Indeno(1,2,3-cd)pyrene	5.4E-10	NA	2.4E-10	NA	7.7E-10	Kidney	4.3E-07	NA	1.9E-07	6.2E-07
			Aroclor 1254	5.9E-10	NA	2.8E-10	NA	8.6E-10	Immune system	2.6E-04	NA	1.2E-04	3.8E-04
			Arsenic	5.0E-08	NA	5.1E-09	NA	5.5E-08	Skin	1.9E-03	NA	2.0E-04	2.1E-03
			Cadmium (water)	NC	NA	NC	NA		Kidney	1.1E-04	NA	7.6E-06	1.2E-04
			Chromium VI (used as Total Chromium)	NC	NA	NC	NA		NOAEL	2.2E-04	NA		2.2E-04
			Copper	NC	NA	NC	NA			--	NA		
			Lead	--	NA	--	NA			--	NA		
			Mercury (as elemental mercury)	NC	NA	NC	NA		Immune system	1.1E-05	NA		1.1E-05
			Nickel	NC	NA	NC	NA		Decreased BW/Organ wt.	6.4E-05	NA		6.4E-05
			Silver	NC	NA	NC	NA		Skin	1.1E-05	NA		1.1E-05
			2,3,7,8-TCDD	5.1E-09	NA	1.7E-11	NA	5.1E-09		--	NA	--	
			CHEMICAL TOTAL	7.9E-08	--	1.6E-08	--	9E-08		2.6E-03	0.0E+00	3.3E-04	3E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						9E-08					3E-03
	EXPOSURE MEDIUM TOTAL							9E-08					3E-03
SURFACE WATER	SURFACE WATER	OUTER COVE	1,2-Dichloroethene (cis)	NC	NA	NC	NA		Hematological system	4.8E-05	NA	--	4.8E-05
			Tetrachloroethene	1.5E-09	NA	2.7E-08	NA	2.8E-08	Liver	5.0E-06	NA	8.7E-05	9.2E-05
			Trichloroethene	2.5E-09	NA	1.3E-08	NA	1.5E-08	Liver, Kidney	3.7E-04	NA	1.8E-03	2.2E-03
			Vinyl Chloride	4.0E-09	NA	7.1E-09	NA	1.1E-08	Liver	1.7E-05	NA	3.0E-05	4.6E-05
			Lead	--	NA	--	NA			--	NA	--	
			CHEMICAL TOTAL	8.0E-09	--	4.6E-08	--	5E-08		4.4E-04	0.0E+00	1.9E-03	2E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						5E-08					2E-03
	EXPOSURE MEDIUM TOTAL							5E-08					2E-03
RECEPTOR TOTAL								1E-07					5E-03
							TOTAL RISK ACROSS ALL MEDIA	1E-07	**TOTAL HAZARD ACROSS ALL MEDIA**				5E-03

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: BJR
Checked by: KJC

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TOTAL HEMATOLOGICAL SYSTEM HI =	**4.8E-05**
TOTAL IMMUNE SYSTEM HI =	**3.9E-04**
TOTAL KIDNEY HI =	**1.3E-04**
TOTAL LIVER HI =	**1.4E-04**
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TOTAL NOAEL HI =	**2.2E-04**
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TOTAL SKIN HI =	**2.2E-03**
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TABLE D12
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY- CURRENT/FUTURE- COMMERCIAL/INDUSTRIAL WORKER- ADULT
SUPPLEMENTAL SITE INVESTIGATION REPORT
FORMER GORHAM MANUFACTURING SITE
333 ADELAIDE AVENUE
PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: COMMERCIAL/INDUSTRIAL WORKER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK (1)					NON-CARCINOGENIC HAZARD QUOTIENT (1)				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	OUTER COVE	1,2-Dichloroethene (cis)	NC	NA	NC	NA		Hematological system	4.0E-09	NA		4.0E-09
			Butylbenzene, sec-	NC	NA	NC	NA		Undetermined	4.0E-09	NA		4.0E-09
			Tetrachloroethene	3.9E-12	NA	0.0E+00	NA	3.9E-12	Liver	4.0E-09	NA		4.0E-09
			Trichloroethene	2.9E-12	NA	0.0E+00	NA	2.9E-12	Liver/Kidney	1.3E-07	NA		1.3E-07
			Vinyl Chloride	2.0E-11	NA	0.0E+00	NA	2.0E-11	Liver	2.7E-08	NA		2.7E-08
			Benzo(a)anthracene	5.2E-10	NA	1.3E-10	NA	6.5E-10	Kidney	1.3E-07	NA	3.3E-08	1.7E-07
			Benzo(a)pyrene	6.5E-09	NA	1.6E-09	NA	8.1E-09	Kidney	1.7E-07	NA	4.2E-08	2.1E-07
			Benzo(b)fluoranthene	1.1E-09	NA	2.7E-10	NA	1.3E-09	Kidney	2.7E-07	NA	6.8E-08	3.4E-07
			Dibenzo(a,h)anthracene	8.1E-10	NA	2.0E-10	NA	1.0E-09	Kidney	2.1E-08	NA	5.2E-09	2.6E-08
			Indeno(1,2,3-cd)pyrene	2.1E-10	NA	5.3E-11	NA	2.6E-10	Kidney	5.4E-08	NA	1.4E-08	6.7E-08
			Aroclor 1254	2.3E-10	NA	6.2E-11	NA	2.9E-10	Immune system	3.2E-05	NA	8.7E-06	4.1E-05
			Arsenic	2.0E-08	NA	1.1E-09	NA	2.1E-08	Skin	2.4E-04	NA	1.4E-05	2.6E-04
			Cadmium (water)	NC	NA	NC	NA		Kidney	1.4E-05	NA	5.4E-07	1.4E-05
			Chromium VI (used as Total Chromium)	NC	NA	NC	NA		NOAEL	2.7E-05	NA		2.7E-05
			Copper	NC	NA	NC	NA			--	NA		
			Lead	--	NA	--	NA			--	NA		
			Mercury (as elemental mercury)	NC	NA	NC	NA		Immune system	1.3E-06	NA		1.3E-06
			Nickel	NC	NA	NC	NA		Decreased BW/Organ wt.	8.1E-06	NA		8.1E-06
			Silver	NC	NA	NC	NA		Skin	1.4E-06	NA		1.4E-06
			2,3,7,8-TCDD	2.0E-09	NA	3.9E-12	NA	2.0E-09		--	NA	--	
			CHEMICAL TOTAL	3.1E-08	--	3.5E-09	--	3E-08		3.3E-04	0.0E+00	2.4E-05	4E-04
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						3E-08					4E-04
	EXPOSURE MEDIUM TOTAL							3E-08					4E-04
SURFACE WATER	SURFACE WATER	OUTER COVE	1,2-Dichloroethene (cis)	NC	NA	NC	NA		Hematological system	8.0E-06	NA	--	8.0E-06
			Tetrachloroethene	8.0E-10	NA	6.9E-09	NA	7.7E-09	Liver	8.3E-07	NA	7.1E-06	7.9E-06
			Trichloroethene	1.3E-09	NA	3.1E-09	NA	4.4E-09	Liver, Kidney	6.1E-05	NA	1.5E-04	2.1E-04
			Vinyl Chloride	2.1E-09	NA	1.7E-09	NA	3.7E-09	Liver	2.8E-06	NA	2.2E-06	5.0E-06
			Lead	--	NA	--	NA			--	NA	--	
			CHEMICAL TOTAL	4.2E-09	--	1.2E-08	--	2E-08		7.3E-05	0.0E+00	1.5E-04	2E-04
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-08					2E-04
	EXPOSURE MEDIUM TOTAL							2E-08					2E-04
RECEPTOR TOTAL								**5E-08**					**6E-04**
							TOTAL RISK ACROSS ALL MEDIA	**5E-08**	**TOTAL HAZARD ACROSS ALL MEDIA**				**6E-04**

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: BJR
Checked by: KJC

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TOTAL HEMATOLOGICAL SYSTEM HI =	8.0E-06
TOTAL IMMUNE SYSTEM HI =	4.2E-05
TOTAL KIDNEY HI =	1.5E-05
TOTAL LIVER HI =	1.3E-05
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TOTAL NOAEL HI =	2.7E-05
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TOTAL SKIN HI =	2.6E-04
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APPENDIX E

Surface Water Uncertainty Analysis

TABLE E1 - UNCERTANINTY
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE- CURRENT/FUTURE- ADOLESCENT TRESPASSER- AGES 7-18
SUPPLEMENTAL SITE INVESTIGATION REPORT
FORMER GORHAM MANUFACTURING
333 ADELAIDE AVENUE
PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: ADOLESCENT TRESPASSER
RECEPTOR AGE: AGES 7-18

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK (1)					NON-CARCINOGENIC HAZARD QUOTIENT (1)				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	INNER COVE	1,2-Dichloroethene (cis)	NC	NA	NC	NA		Hematological system	5.4E-03	NA		5.4E-03
			Butylbenzene, sec-	NC	NA	NC	NA		Undetermined	9.4E-07	NA		9.4E-07
			Tetrachloroethene	2.5E-08	NA	0.0E+00	NA	2.5E-08	Liver	2.8E-04	NA		2.8E-04
			Trichloroethene	8.6E-07	NA	0.0E+00	NA	8.6E-07	Liver/Kidney	4.2E-02	NA		4.2E-02
			Vinyl Chloride	1.1E-06	NA	0.0E+00	NA	1.1E-06	Liver	1.5E-03	NA		1.5E-03
			Benzo(a)anthracene	8.9E-08	NA	2.9E-08	NA	1.2E-07	Kidney	2.4E-05	NA	7.7E-06	3.1E-05
			Benzo(a)pyrene	6.1E-07	NA	2.0E-07	NA	8.1E-07	Kidney	1.6E-05	NA	5.3E-06	2.2E-05
			Benzo(b)fluoranthene	9.1E-08	NA	3.0E-08	NA	1.2E-07	Kidney	2.4E-05	NA	7.9E-06	3.2E-05
			Dibenzo(a,h)anthracene	7.4E-08	NA	2.4E-08	NA	9.8E-08	Kidney	2.0E-06	NA	6.4E-07	2.6E-06
			Indeno(1,2,3-cd)pyrene	1.9E-08	NA	6.1E-09	NA	2.5E-08	Kidney	5.0E-06	NA	1.6E-06	6.6E-06
			Aroclor 1254	1.5E-08	NA	5.3E-09	NA	2.1E-08	Immune system	2.2E-03	NA	7.8E-04	3.0E-03
			Arsenic	2.3E-06	NA	1.7E-07	NA	2.5E-06	Skin	3.0E-02	NA	2.2E-03	3.2E-02
			Cadmium (water)	NC	NA	NC	NA		Kidney	2.7E-03	NA	1.3E-04	2.8E-03
			Chromium VI (used as Total Chromium)	NC	NA	NC	NA		NOAEL	4.0E-02	NA		4.0E-02
			Copper	NC	NA	NC	NA			--	NA		
			Lead	--	NA	--	NA			--	NA		
			Mercury (as elemental mercury)	NC	NA	NC	NA		Immune system	8.8E-04	NA		8.8E-04
			Nickel	NC	NA	NC	NA		Decreased BW/Organ wt.	4.4E-03	NA		4.4E-03
			Silver	NC	NA	NC	NA		Skin	1.4E-02	NA		1.4E-02
			2,3,7,8-TCDD	1.0E-05	NA	2.6E-08	NA	1.0E-05		--	NA	--	
			CHEMICAL TOTAL	1.5E-05	--	4.9E-07	--	2E-05		1.4E-01	0.0E+00	3.2E-03	1E-01
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-05					1E-01
	EXPOSURE MEDIUM TOTAL							2E-05					1E-01
SURFACE WATER	SURFACE WATER	INNER COVE	1,2-Dichloroethene (cis)	NC	NA	NC	NA		Hematological system	1.1E-04	NA	--	1.1E-04
			Tetrachloroethene	1.2E-09	NA	1.3E-08	NA	1.4E-08	Liver	1.4E-05	NA	1.5E-04	1.6E-04
			Trichloroethene	2.4E-08	NA	7.1E-08	NA	9.5E-08	Liver, Kidney	1.1E-03	NA	3.5E-03	4.6E-03
			Vinyl Chloride	7.9E-08	NA	8.5E-08	NA	1.6E-07	Liver	1.1E-04	NA	1.2E-04	2.3E-04
			Benzo(a)anthracene	3.2E-09	NA	7.4E-07	NA	7.5E-07	Kidney	8.6E-07	NA	2.0E-04	2.0E-04
			Benzo(a)pyrene	3.5E-08	NA	1.4E-05	NA	1.4E-05	Kidney	9.3E-07	NA	3.6E-04	3.6E-04
			Dibenzo(a,h)anthracene	3.9E-08	NA	2.4E-05	NA	2.4E-05	Kidney	1.0E-06	NA	6.4E-04	6.4E-04
			Lead	--	NA	--	NA			--	NA	--	
			2,3,7,8-TCDD	3.3E-07	NA	1.2E-04	NA	1.2E-04		--	NA	--	
			CHEMICAL TOTAL	5.1E-07	--	1.6E-04	--	2E-04		1.4E-03	0.0E+00	4.9E-03	6E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-04					6E-03
	EXPOSURE MEDIUM TOTAL							2E-04					6E-03
RECEPTOR TOTAL								**2E-04**					**2E-01**
							TOTAL RISK ACROSS ALL MEDIA	**2E-04**	**TOTAL HAZARD ACROSS ALL MEDIA**				**2E-01**

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: BJR
Checked by: KJC

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TOTAL HEMATOLOGICAL SYSTEM HI =	**5.5E-03**
TOTAL IMMUNE SYSTEM HI =	**3.9E-03**
TOTAL KIDNEY HI =	**4.1E-03**
TOTAL LIVER HI =	**2.2E-03**
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TOTAL NOAEL HI =	**4.0E-02**
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TOTAL SKIN HI =	**4.6E-02**
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TABLE E2 - UNCERTAINTY
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE- CURRENT/FUTURE- ADULT TRESPASSER- AGES 19-30
SUPPLEMENTAL SITE INVESTIGATION REPORT
FORMER GORHAM MANUFACTURING
333 ADELAIDE AVENUE
PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: ADULT TRESPASSER
RECEPTOR AGE: AGES 19-30

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK (1)					NON-CARCINOGENIC HAZARD QUOTIENT (1)				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	INNER COVE	1,2-Dichloroethene (cis)	NC	NA	NC	NA		Hematological system	3.4E-03	NA		3.4E-03
			Butylbenzene, sec-	NC	NA	NC	NA		Undetermined	6.0E-07	NA		6.0E-07
			Tetrachloroethene	1.6E-08	NA	0.0E+00	NA	1.6E-08	Liver	1.8E-04	NA		1.8E-04
			Trichloroethene	5.5E-07	NA	0.0E+00	NA	5.5E-07	Liver/Kidney	2.7E-02	NA		2.7E-02
			Vinyl Chloride	6.9E-07	NA	0.0E+00	NA	6.9E-07	Liver	9.6E-04	NA		9.6E-04
			Benzo(a)anthracene	5.7E-08	NA	2.5E-08	NA	8.2E-08	Kidney	1.5E-05	NA	6.7E-06	2.2E-05
			Benzo(a)pyrene	3.9E-07	NA	1.7E-07	NA	5.6E-07	Kidney	1.0E-05	NA	4.6E-06	1.5E-05
			Benzo(b)fluoranthene	5.8E-08	NA	2.6E-08	NA	8.4E-08	Kidney	1.6E-05	NA	6.9E-06	2.2E-05
			Dibenzo(a,h)anthracene	4.8E-08	NA	2.1E-08	NA	6.9E-08	Kidney	1.3E-06	NA	5.6E-07	1.8E-06
			Indeno(1,2,3-cd)pyrene	1.2E-08	NA	5.3E-09	NA	1.7E-08	Kidney	3.2E-06	NA	1.4E-06	4.6E-06
			Aroclor 1254	9.8E-09	NA	4.7E-09	NA	1.4E-08	Immune system	1.4E-03	NA	6.8E-04	2.1E-03
			Arsenic	1.5E-06	NA	1.5E-07	NA	1.6E-06	Skin	1.9E-02	NA	1.9E-03	2.1E-02
			Cadmium (water)	NC	NA	NC	NA		Kidney	1.7E-03	NA	1.2E-04	1.8E-03
			Chromium VI (used as Total Chromium)	NC	NA	NC	NA		NOAEL	2.6E-02	NA		2.6E-02
			Copper	NC	NA	NC	NA			--	NA		
			Lead	--	NA	--	NA			--	NA		
			Mercury (as elemental mercury)	NC	NA	NC	NA		Immune system	5.7E-04	NA		5.7E-04
			Nickel	NC	NA	NC	NA		Decreased BW/Organ wt.	2.8E-03	NA		2.8E-03
			Silver	NC	NA	NC	NA		Skin	9.1E-03	NA		9.1E-03
			2,3,7,8-TCDD	6.7E-06	NA	2.3E-08	NA	6.7E-06		--	NA	--	
			CHEMICAL TOTAL	1.0E-05	--	4.3E-07	--	1E-05		9.2E-02	0.0E+00	2.8E-03	9E-02
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-05					9E-02
	EXPOSURE MEDIUM TOTAL							1E-05					9E-02
SURFACE WATER	SURFACE WATER	INNER COVE	1,2-Dichloroethene (cis)	NC	NA	NC	NA		Hematological system	6.9E-05	NA	--	6.9E-05
			Tetrachloroethene	7.8E-10	NA	1.2E-08	NA	1.2E-08	Liver	9.0E-06	NA	1.3E-04	1.4E-04
			Trichloroethene	1.5E-08	NA	6.2E-08	NA	7.8E-08	Liver, Kidney	7.4E-04	NA	3.0E-03	3.8E-03
			Vinyl Chloride	5.1E-08	NA	7.4E-08	NA	1.3E-07	Liver	7.1E-05	NA	1.0E-04	1.7E-04
			Benzo(a)anthracene	2.1E-09	NA	6.5E-07	NA	6.5E-07	Kidney	5.5E-07	NA	1.7E-04	1.7E-04
			Benzo(a)pyrene	2.2E-08	NA	1.2E-05	NA	1.2E-05	Kidney	6.0E-07	NA	3.2E-04	3.2E-04
			Dibenzo(a,h)anthracene	2.5E-08	NA	2.1E-05	NA	2.1E-05	Kidney	6.7E-07	NA	5.6E-04	5.6E-04
			Lead	--	NA	--	NA			--	NA	--	
			2,3,7,8-TCDD	2.1E-07	NA	1.0E-04	NA	1.0E-04		--	NA	--	
			CHEMICAL TOTAL	3.3E-07	--	1.4E-04	--	1E-04		8.9E-04	0.0E+00	4.3E-03	5E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-04					5E-03
	EXPOSURE MEDIUM TOTAL							1E-04					5E-03
RECEPTOR TOTAL								1E-04					1E-01
							TOTAL RISK ACROSS ALL MEDIA	1E-04	TOTAL HAZARD ACROSS ALL MEDIA				1E-01

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TOTAL HEMATOLOGICAL SYSTEM HI =	3.5E-03
TOTAL IMMUNE SYSTEM HI =	2.7E-03
TOTAL KIDNEY HI =	2.9E-03
TOTAL LIVER HI =	1.5E-03
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TOTAL NOAEL HI =	2.6E-02
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TOTAL SKIN HI =	3.0E-02
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NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: BJR
Checked by: KJC

TABLE E3 - UNCERTAINTY
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE- CURRENT/FUTURE- COMMERCIAL/INDUSTRIAL WORKER- ADULT
SUPPLEMENTAL SITE INVESTIGATION REPORT
FORMER GORHAM MANUFACTURING
333 ADELAIDE AVENUE
PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: COMMERCIAL/INDUSTRIAL WORKER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK (1)					NON-CARCINOGENIC HAZARD QUOTIENT (1)				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	INNER COVE	1,2-Dichloroethene (cis)	NC	NA	NC	NA		Hematological system	5.7E-04	NA		5.7E-04
			Butylbenzene, sec-	NC	NA	NC	NA		Undetermined	1.0E-07	NA		1.0E-07
			Tetrachloroethene	5.8E-08	NA	0.0E+00	NA	5.8E-08	Liver	3.0E-05	NA		3.0E-05
			Trichloroethene	1.9E-07	NA	0.0E+00	NA	1.9E-07	Liver/Kidney	4.5E-03	NA		4.5E-03
			Vinyl Chloride	2.4E-07	NA	0.0E+00	NA	2.4E-07	Liver	1.6E-04	NA		1.6E-04
			Benzo(a)anthracene	2.0E-08	NA	5.0E-09	NA	2.5E-08	Kidney	2.5E-06	NA	6.4E-07	3.2E-06
			Benzo(a)pyrene	1.4E-07	NA	3.4E-08	NA	1.7E-07	Kidney	1.7E-06	NA	4.4E-07	2.2E-06
			Benzo(b)fluoranthene	2.0E-08	NA	5.1E-09	NA	2.5E-08	Kidney	2.6E-06	NA	6.6E-07	3.3E-06
			Dibenzo(a,h)anthracene	1.6E-08	NA	4.2E-09	NA	2.1E-08	Kidney	2.1E-07	NA	5.3E-08	2.6E-07
			Indeno(1,2,3-cd)pyrene	4.2E-09	NA	1.1E-09	NA	5.2E-09	Kidney	5.3E-07	NA	1.3E-07	6.7E-07
			Aroclor 1254	3.4E-09	NA	9.3E-10	NA	4.3E-09	Immune system	2.4E-04	NA	6.5E-05	3.0E-04
			Arsenic	5.1E-07	NA	3.0E-08	NA	5.4E-07	Skin	3.2E-03	NA	1.8E-04	3.4E-03
			Cadmium (water)	NC	NA	NC	NA		Kidney	2.9E-04	NA	1.1E-05	3.0E-04
			Chromium VI (used as Total Chromium)	NC	NA	NC	NA		NOAEL	4.3E-03	NA		4.3E-03
			Copper	NC	NA	NC	NA			--	NA		
			Lead	--	NA	--	NA			--	NA		
			Mercury (as elemental mercury)	NC	NA	NC	NA		Immune system	9.5E-05	NA		9.5E-05
			Nickel	NC	NA	NC	NA		Decreased BW/Organ wt.	4.7E-04	NA		4.7E-04
			Silver	NC	NA	NC	NA		Skin	1.5E-03	NA		1.5E-03
			2,3,7,8-TCDD	2.3E-06	NA	4.5E-09	NA	2.3E-06		--	NA	--	
			CHEMICAL TOTAL	3.5E-06	--	8.5E-08	--	4E-06		1.5E-02	0.0E+00	2.6E-04	2E-02
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						4E-06					2E-02
	EXPOSURE MEDIUM TOTAL							4E-06					2E-02
SURFACE WATER	SURFACE WATER	INNER COVE	1,2-Dichloroethene (cis)	NC	NA	NC	NA		Hematological system	1.7E-06	NA	--	1.7E-06
			Tetrachloroethene	4.3E-10	NA	3.7E-08	NA	3.7E-08	Liver	2.2E-07	NA	1.9E-05	1.9E-05
			Trichloroethene	7.9E-10	NA	1.9E-08	NA	2.0E-08	Liver, Kidney	1.8E-05	NA	4.4E-04	4.6E-04
			Vinyl Chloride	2.6E-09	NA	2.1E-08	NA	2.4E-08	Liver	1.8E-06	NA	1.4E-05	1.6E-05
			Benzo(a)anthracene	1.1E-10	NA	2.0E-07	NA	2.0E-07	Kidney	1.4E-08	NA	2.5E-05	2.5E-05
			Benzo(a)pyrene	1.2E-09	NA	3.6E-06	NA	3.6E-06	Kidney	1.5E-08	NA	4.6E-05	4.6E-05
			Dibenzo(a,h)anthracene	1.3E-09	NA	6.3E-06	NA	6.3E-06	Kidney	1.7E-08	NA	8.1E-05	8.1E-05
			Lead	--	NA	--	NA			--	NA	--	
			2,3,7,8-TCDD	1.1E-08	NA	3.1E-05	NA	3.1E-05		--	NA	--	
			CHEMICAL TOTAL	1.8E-08	--	4.2E-05	--	4E-05		2.2E-05	0.0E+00	6.2E-04	6E-04
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						4E-05					6E-04
	EXPOSURE MEDIUM TOTAL							4E-05					6E-04
RECEPTOR TOTAL								**5E-05**					**2E-02**
							TOTAL RISK ACROSS ALL MEDIA	**5E-05**	**TOTAL HAZARD ACROSS ALL MEDIA**				**2E-02**

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: BJR
Checked by: KJC

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TOTAL HEMATOLOGICAL SYSTEM HI =	**5.8E-04**
TOTAL IMMUNE SYSTEM HI =	**4.0E-04**
TOTAL KIDNEY HI =	**4.6E-04**
TOTAL LIVER HI =	**2.3E-04**
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TOTAL NOAEL HI =	**4.3E-03**
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TOTAL SKIN HI =	**4.9E-03**
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TABLE E4 - UNCERTAINTY
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE- CURRENT/FUTURE- ADOLESCENT TRESPASSER- AGES 7-18
SUPPLEMENTAL SITE INVESTIGATION REPORT
FORMER GORHAM MANUFACTURING
333 ADELAIDE AVENUE
PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: ADOLESCENT TRESPASSER
RECEPTOR AGE: AGES 7-18

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK (1) INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	NON-CARCINOGENIC HAZARD QUOTIENT (1) PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	OUTER COVE	1,2-Dichloroethene (cis)	NC	NA	NC	NA		Hematological system	7.5E-08	NA		7.5E-08
			Butylbenzene, sec-	NC	NA	NC	NA		Undetermined	7.5E-08	NA		7.5E-08
			Tetrachloroethene	6.9E-11	NA	0.0E+00	NA	6.9E-11	Liver	7.5E-08	NA		7.5E-08
			Trichloroethene	5.1E-11	NA	0.0E+00	NA	5.1E-11	Liver/Kidney	2.5E-06	NA		2.5E-06
			Vinyl Chloride	3.6E-10	NA	0.0E+00	NA	3.6E-10	Liver	5.0E-07	NA		5.0E-07
			Benzo(a)anthracene	2.7E-08	NA	8.7E-09	NA	3.5E-08	Kidney	7.1E-06	NA	2.3E-06	9.4E-06
			Benzo(a)pyrene	3.3E-07	NA	1.1E-07	NA	4.4E-07	Kidney	8.9E-06	NA	2.9E-06	1.2E-05
			Benzo(b)fluoranthene	5.5E-08	NA	1.8E-08	NA	7.3E-08	Kidney	1.5E-05	NA	4.7E-06	1.9E-05
			Dibenzo(a,h)anthracene	3.1E-08	NA	1.0E-08	NA	4.2E-08	Kidney	8.4E-07	NA	2.7E-07	1.1E-06
			Indeno(1,2,3-cd)pyrene	1.0E-08	NA	3.3E-09	NA	1.3E-08	Kidney	2.7E-06	NA	8.7E-07	3.6E-06
			Aroclor 1254	4.1E-09	NA	1.4E-09	NA	5.5E-09	Immune system	6.0E-04	NA	2.1E-04	8.1E-04
			Arsenic	9.2E-07	NA	6.9E-08	NA	9.9E-07	Skin	1.2E-02	NA	8.9E-04	1.3E-02
			Cadmium (water)	NC	NA	NC	NA		Kidney	2.6E-04	NA	1.3E-05	2.7E-04
			Chromium VI (used as Total Chromium)	NC	NA	NC	NA		NOAEL	7.2E-04	NA		7.2E-04
			Copper	NC	NA	NC	NA			--	NA		
			Lead	--	NA	--	NA			--	NA		
			Mercury (as elemental mercury)	NC	NA	NC	NA		Immune system	2.5E-05	NA		2.5E-05
			Nickel	NC	NA	NC	NA		Decreased BW/Organ wt.	3.5E-04	NA		3.5E-04
			Silver	NC	NA	NC	NA		Skin	2.6E-05	NA		2.6E-05
			2,3,7,8-TCDD	9.0E-08	NA	2.3E-10	NA	9.1E-08		--	NA	--	
			CHEMICAL TOTAL	1.5E-06	--	2.2E-07	--	2E-06		1.4E-02	0.0E+00	1.1E-03	2E-02
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-06					2E-02
	EXPOSURE MEDIUM TOTAL							2E-06					2E-02
SURFACE WATER	SURFACE WATER	OUTER COVE	1,2-Dichloroethene (cis)	NC	NA	NC	NA		Hematological system	2.2E-04	NA	--	2.2E-04
			Tetrachloroethene	9.6E-09	NA	1.0E-07	NA	1.1E-07	Liver	1.0E-05	NA	1.1E-04	1.2E-04
			Trichloroethene	3.3E-08	NA	9.9E-08	NA	1.3E-07	Liver, Kidney	1.6E-03	NA	4.8E-03	6.4E-03
			Vinyl Chloride	2.5E-08	NA	2.7E-08	NA	5.1E-08	Liver	3.5E-05	NA	3.7E-05	7.2E-05
			Benzo(a)anthracene	2.6E-09	NA	6.0E-07	NA	6.0E-07	Kidney	6.9E-07	NA	1.6E-04	1.6E-04
			Benzo(a)pyrene	2.6E-08	NA	1.0E-05	NA	1.0E-05	Kidney	6.9E-07	NA	2.7E-04	2.7E-04
			Dibenzo(a,h)anthracene	2.6E-08	NA	1.6E-05	NA	1.6E-05	Kidney	6.9E-07	NA	4.2E-04	4.2E-04
			Lead	--	NA	--	NA			--	NA	--	
			2,3,7,8-TCDD	6.8E-08	NA	2.4E-05	NA	2.4E-05		--	NA	--	
			CHEMICAL TOTAL	1.9E-07	--	5.1E-05	--	5E-05		1.9E-03	0.0E+00	5.8E-03	8E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						5E-05					8E-03
	EXPOSURE MEDIUM TOTAL							5E-05					8E-03
RECEPTOR TOTAL								5E-05					2E-02
							TOTAL RISK ACROSS ALL MEDIA	5E-05	TOTAL HAZARD ACROSS ALL MEDIA				2E-02

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TOTAL HEMATOLOGICAL SYSTEM HI =	2.2E-04
TOTAL IMMUNE SYSTEM HI =	8.3E-04
TOTAL KIDNEY HI =	1.2E-03
TOTAL LIVER HI =	1.9E-04
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TOTAL NOAEL HI =	7.2E-04
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TOTAL SKIN HI =	1.3E-02
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NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: BJR
Checked by: KJC

TABLE E5 - UNCERTAINTY
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE- CURRENT/FUTURE- ADULT TRESPASSER- AGES 19-30
SUPPLEMENTAL SITE INVESTIGATION REPORT
FORMER GORHAM MANUFACTURING
333 ADELAIDE AVENUE
PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: ADULT TRESPASSER
RECEPTOR AGE: AGES 19-30

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK (1)					NON-CARCINOGENIC HAZARD QUOTIENT (1)				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	OUTER COVE	1,2-Dichloroethene (cis)	NC	NA	NC	NA		Hematological system	4.8E-08	NA		4.8E-08
			Butylbenzene, sec-	NC	NA	NC	NA		Undetermined	4.8E-08	NA		4.8E-08
			Tetrachloroethene	4.5E-11	NA	0.0E+00	NA	4.5E-11	Liver	4.8E-08	NA		4.8E-08
			Trichloroethene	3.3E-11	NA	0.0E+00	NA	3.3E-11	Liver/Kidney	1.6E-06	NA		1.6E-06
			Vinyl Chloride	2.3E-10	NA	0.0E+00	NA	2.3E-10	Liver	3.2E-07	NA		3.2E-07
			Benzo(a)anthracene	1.7E-08	NA	7.6E-09	NA	2.5E-08	Kidney	4.6E-06	NA	2.0E-06	6.6E-06
			Benzo(a)pyrene	2.2E-07	NA	9.5E-08	NA	3.1E-07	Kidney	5.7E-06	NA	2.5E-06	8.3E-06
			Benzo(b)fluoranthene	3.5E-08	NA	1.6E-08	NA	5.1E-08	Kidney	9.4E-06	NA	4.1E-06	1.4E-05
			Dibenzo(a,h)anthracene	2.0E-08	NA	8.9E-09	NA	2.9E-08	Kidney	5.4E-07	NA	2.4E-07	7.7E-07
			Indeno(1,2,3-cd)pyrene	6.5E-09	NA	2.9E-09	NA	9.3E-09	Kidney	1.7E-06	NA	7.6E-07	2.5E-06
			Aroclor 1254	2.6E-09	NA	1.3E-09	NA	3.9E-09	Immune system	3.8E-04	NA	1.8E-04	5.7E-04
			Arsenic	5.9E-07	NA	6.0E-08	NA	6.5E-07	Skin	7.7E-03	NA	7.8E-04	8.4E-03
			Cadmium (water)	NC	NA	NC	NA		Kidney	1.7E-04	NA	1.1E-05	1.8E-04
			Chromium VI (used as Total Chromium)	NC	NA	NC	NA		NOAEL	4.7E-04	NA		4.7E-04
			Copper	NC	NA	NC	NA			--	NA		
			Lead	--	NA	--	NA			--	NA		
			Mercury (as elemental mercury)	NC	NA	NC	NA		Immune system	1.6E-05	NA		1.6E-05
			Nickel	NC	NA	NC	NA		Decreased BW/Organ wt.	2.2E-04	NA		2.2E-04
			Silver	NC	NA	NC	NA		Skin	1.7E-05	NA		1.7E-05
			2,3,7,8-TCDD	5.8E-08	NA	2.0E-10	NA	5.8E-08		--	NA	--	
			CHEMICAL TOTAL	9.5E-07	--	1.9E-07	--	1E-06		8.9E-03	0.0E+00	9.9E-04	1E-02
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-06					1E-02
	EXPOSURE MEDIUM TOTAL							1E-06					1E-02
SURFACE WATER	SURFACE WATER	OUTER COVE	1,2-Dichloroethene (cis)	NC	NA	NC	NA		Hematological system	1.4E-04	NA	--	1.4E-04
			Tetrachloroethene	6.2E-09	NA	9.1E-08	NA	9.7E-08	Liver	6.7E-06	NA	9.8E-05	1.1E-04
			Trichloroethene	2.1E-08	NA	8.7E-08	NA	1.1E-07	Liver, Kidney	1.0E-03	NA	4.2E-03	5.2E-03
			Vinyl Chloride	1.6E-08	NA	2.3E-08	NA	3.9E-08	Liver	2.2E-05	NA	3.2E-05	5.5E-05
			Benzo(a)anthracene	1.7E-09	NA	5.2E-07	NA	5.2E-07	Kidney	4.4E-07	NA	1.4E-04	1.4E-04
			Benzo(a)pyrene	1.7E-08	NA	8.9E-06	NA	8.9E-06	Kidney	4.4E-07	NA	2.4E-04	2.4E-04
			Dibenzo(a,h)anthracene	1.7E-08	NA	1.4E-05	NA	1.4E-05	Kidney	4.4E-07	NA	3.7E-04	3.7E-04
			Lead	--	NA	--	NA			--	NA	--	
			2,3,7,8-TCDD	4.4E-08	NA	2.1E-05	NA	2.1E-05		--	NA	--	
			CHEMICAL TOTAL	1.2E-07	--	4.5E-05	--	4E-05		1.2E-03	0.0E+00	5.1E-03	6E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						4E-05					6E-03
	EXPOSURE MEDIUM TOTAL							4E-05					6E-03
RECEPTOR TOTAL								5E-05					2E-02
							TOTAL RISK ACROSS ALL MEDIA	5E-05	**TOTAL HAZARD ACROSS ALL MEDIA**				2E-02

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: BJR
Checked by: KJC

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TOTAL HEMATOLOGICAL SYSTEM HI =	1.4E-04
TOTAL IMMUNE SYSTEM HI =	5.8E-04
TOTAL KIDNEY HI =	9.6E-04
TOTAL LIVER HI =	1.6E-04
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TOTAL NOAEL HI =	4.7E-04
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TOTAL SKIN HI =	8.4E-03
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TABLE E6 - UNCERTAINTY
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - REASONABLE MAXIMUM EXPOSURE- CURRENT/FUTURE- COMMERCIAL/INDUSTRIAL WORKER- ADULT
SUPPLEMENTAL SITE INVESTIGATION REPORT
FORMER GORHAM MANUFACTURING
333 ADELAIDE AVENUE
PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: COMMERCIAL/INDUSTRIAL WORKER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK (1)					NON-CARCINOGENIC HAZARD QUOTIENT (1)				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	OUTER COVE	1,2-Dichloroethene (cis)	NC	NA	NC	NA		Hematological system	8.0E-09	NA		8.0E-09
			Butylbenzene, sec-	NC	NA	NC	NA		Undetermined	8.0E-09	NA		8.0E-09
			Tetrachloroethene	1.6E-11	NA	0.0E+00	NA	1.6E-11	Liver	8.0E-09	NA		8.0E-09
			Trichloroethene	1.1E-11	NA	0.0E+00	NA	1.1E-11	Liver/Kidney	2.7E-07	NA		2.7E-07
			Vinyl Chloride	8.1E-11	NA	0.0E+00	NA	8.1E-11	Liver	5.4E-08	NA		5.4E-08
			Benzo(a)anthracene	5.9E-09	NA	1.5E-09	NA	7.4E-09	Kidney	7.6E-07	NA	1.9E-07	9.5E-07
			Benzo(a)pyrene	7.5E-08	NA	1.9E-08	NA	9.4E-08	Kidney	9.6E-07	NA	2.4E-07	1.2E-06
			Benzo(b)fluoranthene	1.2E-08	NA	3.1E-09	NA	1.5E-08	Kidney	1.6E-06	NA	4.0E-07	2.0E-06
			Dibenzo(a,h)anthracene	7.0E-09	NA	1.8E-09	NA	8.8E-09	Kidney	8.9E-08	NA	2.3E-08	1.1E-07
			Indeno(1,2,3-cd)pyrene	2.2E-09	NA	5.7E-10	NA	2.8E-09	Kidney	2.9E-07	NA	7.3E-08	3.6E-07
			Aroclor 1254	9.2E-10	NA	2.5E-10	NA	1.2E-09	Immune system	6.4E-05	NA	1.7E-05	8.2E-05
			Arsenic	2.0E-07	NA	1.2E-08	NA	2.2E-07	Skin	1.3E-03	NA	7.4E-05	1.3E-03
			Cadmium (water)	NC	NA	NC	NA		Kidney	2.8E-05	NA	1.1E-06	2.9E-05
			Chromium VI (used as Total Chromium)	NC	NA	NC	NA		NOAEL	7.8E-05	NA		7.8E-05
			Copper	NC	NA	NC	NA			--	NA		
			Lead	--	NA	--	NA			--	NA		
			Mercury (as elemental mercury)	NC	NA	NC	NA		Immune system	2.6E-06	NA		2.6E-06
			Nickel	NC	NA	NC	NA		Decreased BW/Organ wt.	3.7E-05	NA		3.7E-05
			Silver	NC	NA	NC	NA		Skin	2.8E-06	NA		2.8E-06
			2,3,7,8-TCDD	2.0E-08	NA	3.9E-11	NA	2.0E-08		--	NA	--	
			CHEMICAL TOTAL	3.3E-07	--	3.8E-08	--	4E-07		1.5E-03	0.0E+00	9.4E-05	2E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						4E-07					2E-03
	EXPOSURE MEDIUM TOTAL							4E-07					2E-03
SURFACE WATER	SURFACE WATER	OUTER COVE	1,2-Dichloroethene (cis)	NC	NA	NC	NA		Hematological system	3.6E-06	NA	--	3.6E-06
			Tetrachloroethene	3.2E-10	NA	2.7E-08	NA	2.8E-08	Liver	1.7E-07	NA	1.4E-05	1.4E-05
			Trichloroethene	1.1E-09	NA	2.6E-08	NA	2.7E-08	Liver, Kidney	2.6E-05	NA	6.1E-04	6.3E-04
			Vinyl Chloride	8.3E-10	NA	6.6E-09	NA	7.5E-09	Liver	5.5E-07	NA	4.4E-06	5.0E-06
			Benzo(a)anthracene	8.7E-11	NA	1.6E-07	NA	1.6E-07	Kidney	1.1E-08	NA	2.0E-05	2.0E-05
			Benzo(a)pyrene	8.7E-10	NA	2.7E-06	NA	2.7E-06	Kidney	1.1E-08	NA	3.4E-05	3.4E-05
			Dibenzo(a,h)anthracene	8.7E-10	NA	4.2E-06	NA	4.2E-06	Kidney	1.1E-08	NA	5.3E-05	5.3E-05
			Lead	--	NA	--	NA			--	NA	--	
			2,3,7,8-TCDD	2.3E-09	NA	6.4E-06	NA	6.4E-06		--	NA	--	
			CHEMICAL TOTAL	6.3E-09	--	1.3E-05	--	1E-05		3.0E-05	0.0E+00	7.3E-04	8E-04
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-05					8E-04
	EXPOSURE MEDIUM TOTAL							1E-05					8E-04
RECEPTOR TOTAL								1E-05					2E-03
							TOTAL RISK ACROSS ALL MEDIA	1E-05	TOTAL HAZARD ACROSS ALL MEDIA				2E-03

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TOTAL HEMATOLOGICAL SYSTEM HI =	3.6E-06
TOTAL IMMUNE SYSTEM HI =	8.4E-05
TOTAL KIDNEY HI =	1.4E-04
TOTAL LIVER HI =	1.9E-05
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TOTAL NOAEL HI =	7.8E-05
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TOTAL SKIN HI =	1.4E-03
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NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: BJR
Checked by: KJC

TABLE E7 - UNCERTIANTY
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY- CURRENT/FUTURE- ADOLESCENT TRESPASSER- AGES 7-18
SUPPLEMENTAL SITE INVESTIGATION REPORT
FORMER GORHAM MANUFACTURING
333 ADELAIDE AVENUE
PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: ADOLESCENT TRESPASSER
RECEPTOR AGE: AGES 7-18

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK (1)					NON-CARCINOGENIC HAZARD QUOTIENT (1)				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	INNER COVE	1,2-Dichloroethene (cis)	NC	NA	NC	NA		Hematological system	2.8E-04	NA		2.8E-04
			Butylbenzene, sec-	NC	NA	NC	NA		Undetermined	6.3E-07	NA		6.3E-07
			Tetrachloroethene	4.3E-09	NA	0.0E+00	NA	4.3E-09	Liver	1.9E-05	NA		1.9E-05
			Trichloroethene	1.3E-08	NA	0.0E+00	NA	1.3E-08	Liver/Kidney	2.6E-03	NA		2.6E-03
			Vinyl Chloride	2.7E-08	NA	0.0E+00	NA	2.7E-08	Liver	1.5E-04	NA		1.5E-04
			Benzo(a)anthracene	7.0E-09	NA	2.3E-09	NA	9.2E-09	Kidney	7.4E-06	NA	2.4E-06	9.8E-06
			Benzo(a)pyrene	4.4E-08	NA	1.4E-08	NA	5.8E-08	Kidney	4.7E-06	NA	1.5E-06	6.2E-06
			Benzo(b)fluoranthene	7.7E-09	NA	2.5E-09	NA	1.0E-08	Kidney	8.2E-06	NA	2.7E-06	1.1E-05
			Dibenzo(a,h)anthracene	7.4E-09	NA	2.4E-09	NA	9.8E-09	Kidney	7.9E-07	NA	2.6E-07	1.0E-06
			Indeno(1,2,3-cd)pyrene	1.6E-09	NA	5.1E-10	NA	2.1E-09	Kidney	1.7E-06	NA	5.4E-07	2.2E-06
			Aroclor 1254	1.7E-09	NA	6.1E-10	NA	2.4E-09	Immune system	1.0E-03	NA	3.6E-04	1.4E-03
			Arsenic	2.4E-07	NA	1.8E-08	NA	2.6E-07	Skin	1.2E-02	NA	9.3E-04	1.3E-02
			Cadmium (water)	NC	NA	NC	NA		Kidney	1.2E-03	NA	6.1E-05	1.3E-03
			Chromium VI (used as Total Chromium)	NC	NA	NC	NA		NOAEL	1.6E-02	NA		1.6E-02
			Copper	NC	NA	NC	NA			--	NA		
			Lead	--	NA	--	NA			--	NA		
			Mercury (as elemental mercury)	NC	NA	NC	NA		Immune system	3.5E-04	NA		3.5E-04
			Nickel	NC	NA	NC	NA		Decreased BW/Organ wt.	1.7E-03	NA		1.7E-03
			Silver	NC	NA	NC	NA		Skin	3.5E-03	NA		3.5E-03
			2,3,7,8-TCDD	8.6E-07	NA	2.2E-09	NA	8.6E-07		--	NA	--	
			CHEMICAL TOTAL	1.2E-06	--	4.3E-08	--	1E-06		3.9E-02	0.0E+00	1.4E-03	4E-02
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-06					4E-02
	EXPOSURE MEDIUM TOTAL							1E-06					4E-02
SURFACE WATER	SURFACE WATER	INNER COVE	1,2-Dichloroethene (cis)	NC	NA	NC	NA		Hematological system	7.1E-05	NA	--	7.1E-05
			Tetrachloroethene	1.9E-10	NA	2.4E-09	NA	2.6E-09	Liver	8.7E-06	NA	1.1E-04	1.2E-04
			Trichloroethene	3.5E-09	NA	1.3E-08	NA	1.6E-08	Liver, Kidney	6.9E-04	NA	2.5E-03	3.2E-03
			Vinyl Chloride	1.2E-08	NA	1.6E-08	NA	2.8E-08	Liver	6.9E-05	NA	8.9E-05	1.6E-04
			Benzo(a)anthracene	5.3E-10	NA	1.4E-07	NA	1.4E-07	Kidney	5.6E-07	NA	1.5E-04	1.5E-04
			Benzo(a)pyrene	5.4E-09	NA	2.5E-06	NA	2.5E-06	Kidney	5.8E-07	NA	2.7E-04	2.7E-04
			Dibenzo(a,h)anthracene	5.7E-09	NA	4.1E-06	NA	4.1E-06	Kidney	6.1E-07	NA	4.3E-04	4.3E-04
			Lead	--	NA	--	NA			--	NA	--	
			2,3,7,8-TCDD	3.7E-08	NA	1.6E-05	NA	1.6E-05		--	NA	--	
			CHEMICAL TOTAL	6.5E-08	--	2.3E-05	--	2E-05		8.4E-04	0.0E+00	3.6E-03	4E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						2E-05					4E-03
	EXPOSURE MEDIUM TOTAL							2E-05					4E-03
RECEPTOR TOTAL								**2E-05**					**4E-02**
								TOTAL RISK ACROSS ALL MEDIA **2E-05**					**TOTAL HAZARD ACROSS ALL MEDIA** **4E-02**

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: BJR
Checked by: KJC

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TOTAL HEMATOLOGICAL SYSTEM HI =	3.5E-04
TOTAL IMMUNE SYSTEM HI =	1.7E-03
TOTAL KIDNEY HI =	2.2E-03
TOTAL LIVER HI =	4.5E-04
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TOTAL NOAEL HI =	1.6E-02
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TOTAL SKIN HI =	1.7E-02
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TABLE E8 - UNCERTAINTY
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY- CURRENT/FUTURE- ADULT TRESPASSER- AGES 19-30
SUPPLEMENTAL SITE INVESTIGATION REPORT
FORMER GORHAM MANUFACTURING
333 ADELAIDE AVENUE
PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: ADULT TRESPASSER
RECEPTOR AGE: AGES 19-30

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK (1)					NON-CARCINOGENIC HAZARD QUOTIENT (1)				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	INNER COVE	1,2-Dichloroethene (cis)	NC	NA	NC	NA		Hematological system	1.8E-04	NA		1.8E-04
			Butylbenzene, sec-	NC	NA	NC	NA		Undetermined	4.0E-07	NA		4.0E-07
			Tetrachloroethene	3.7E-09	NA	0.0E+00	NA	3.7E-09	Liver	1.2E-05	NA		1.2E-05
			Trichloroethene	1.1E-08	NA	0.0E+00	NA	1.1E-08	Liver/Kidney	1.7E-03	NA		1.7E-03
			Vinyl Chloride	2.3E-08	NA	0.0E+00	NA	2.3E-08	Liver	9.8E-05	NA		9.8E-05
			Benzo(a)anthracene	6.0E-09	NA	2.6E-09	NA	8.6E-09	Kidney	4.8E-06	NA	2.1E-06	6.9E-06
			Benzo(a)pyrene	3.8E-08	NA	1.7E-08	NA	5.4E-08	Kidney	3.0E-06	NA	1.3E-06	4.3E-06
			Benzo(b)fluoranthene	6.6E-09	NA	2.9E-09	NA	9.5E-09	Kidney	5.3E-06	NA	2.3E-06	7.6E-06
			Dibenzo(a,h)anthracene	6.3E-09	NA	2.8E-09	NA	9.1E-09	Kidney	5.1E-07	NA	2.2E-07	7.3E-07
			Indeno(1,2,3-cd)pyrene	1.3E-09	NA	5.9E-10	NA	1.9E-09	Kidney	1.1E-06	NA	4.8E-07	1.5E-06
			Aroclor 1254	1.5E-09	NA	7.1E-10	NA	2.2E-09	Immune system	6.5E-04	NA	3.1E-04	9.7E-04
			Arsenic	2.0E-07	NA	2.1E-08	NA	2.2E-07	Skin	7.9E-03	NA	8.1E-04	8.7E-03
			Cadmium (water)	NC	NA	NC	NA		Kidney	7.8E-04	NA	5.3E-05	8.4E-04
			Chromium VI (used as Total Chromium)	NC	NA	NC	NA		NOAEL	1.0E-02	NA		1.0E-02
			Copper	NC	NA	NC	NA			--	NA		
			Lead	--	NA	--	NA			--	NA		
			Mercury (as elemental mercury)	NC	NA	NC	NA		Immune system	2.2E-04	NA		2.2E-04
			Nickel	NC	NA	NC	NA		Decreased BW/Organ wt.	1.1E-03	NA		1.1E-03
			Silver	NC	NA	NC	NA		Skin	2.2E-03	NA		2.2E-03
			2,3,7,8-TCDD	7.4E-07	NA	2.5E-09	NA	7.4E-07		--	NA	--	
			CHEMICAL TOTAL	1.0E-06	--	5.0E-08	--	1E-06		2.5E-02	0.0E+00	1.2E-03	3E-02
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-06					3E-02
	EXPOSURE MEDIUM TOTAL							1E-06					3E-02
SURFACE WATER	SURFACE WATER	INNER COVE	1,2-Dichloroethene (cis)	NC	NA	NC	NA		Hematological system	4.6E-05	NA	--	4.6E-05
			Tetrachloroethene	1.6E-10	NA	2.8E-09	NA	3.0E-09	Liver	5.6E-06	NA	9.7E-05	1.0E-04
			Trichloroethene	3.0E-09	NA	1.5E-08	NA	1.8E-08	Liver, Kidney	4.4E-04	NA	2.2E-03	2.7E-03
			Vinyl Chloride	1.1E-08	NA	1.9E-08	NA	2.9E-08	Liver	4.4E-05	NA	7.8E-05	1.2E-04
			Benzo(a)anthracene	4.5E-10	NA	1.7E-07	NA	1.7E-07	Kidney	3.6E-07	NA	1.3E-04	1.3E-04
			Benzo(a)pyrene	4.6E-09	NA	2.9E-06	NA	2.9E-06	Kidney	3.7E-07	NA	2.3E-04	2.3E-04
			Dibenzo(a,h)anthracene	4.9E-09	NA	4.8E-06	NA	4.8E-06	Kidney	3.9E-07	NA	3.8E-04	3.8E-04
			Lead	--	NA	--	NA			--	NA	--	
			2,3,7,8-TCDD	3.2E-08	NA	1.9E-05	NA	1.9E-05		--	NA	--	
			CHEMICAL TOTAL	5.6E-08	--	2.6E-05	--	3E-05		5.4E-04	0.0E+00	3.1E-03	4E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						3E-05					4E-03
	EXPOSURE MEDIUM TOTAL							3E-05					4E-03
RECEPTOR TOTAL								3E-05					3E-02
							TOTAL RISK ACROSS ALL MEDIA	3E-05	**TOTAL HAZARD ACROSS ALL MEDIA**				3E-02

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: BJR
Checked by: KJC

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TOTAL HEMATOLOGICAL SYSTEM HI =	2.3E-04
TOTAL IMMUNE SYSTEM HI =	1.2E-03
TOTAL KIDNEY HI =	1.6E-03
TOTAL LIVER HI =	3.3E-04
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TOTAL NOAEL HI =	1.0E-02
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TOTAL SKIN HI =	1.1E-02
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TABLE E9 - UNCERTAINTY
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY- CURRENT/FUTURE- COMMERCIAL/INDUSTRIAL WORKER- ADULT
SUPPLEMENTAL SITE INVESTIGATION REPORT
FORMER GORHAM MANUFACTURING
333 ADELAIDE AVENUE
PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: COMMERCIAL/INDUSTRIAL WORKER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK (1)					NON-CARCINOGENIC HAZARD QUOTIENT (1)				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	INNER COVE	1,2-Dichloroethene (cis)	NC	NA	NC	NA		Hematological system	2.3E-05	NA		2.3E-05
			Butylbenzene, sec-	NC	NA	NC	NA		Undetermined	5.0E-08	NA		5.0E-08
			Tetrachloroethene	1.5E-09	NA	0.0E+00	NA	1.5E-09	Liver	1.5E-06	NA		1.5E-06
			Trichloroethene	4.4E-09	NA	0.0E+00	NA	4.4E-09	Liver/Kidney	2.1E-04	NA		2.1E-04
			Vinyl Chloride	9.2E-09	NA	0.0E+00	NA	9.2E-09	Liver	1.2E-05	NA		1.2E-05
			Benzo(a)anthracene	2.3E-09	NA	5.9E-10	NA	2.9E-09	Kidney	6.0E-07	NA	1.5E-07	7.5E-07
			Benzo(a)pyrene	1.5E-08	NA	3.7E-09	NA	1.8E-08	Kidney	3.8E-07	NA	9.5E-08	4.7E-07
			Benzo(b)fluoranthene	2.6E-09	NA	6.5E-10	NA	3.2E-09	Kidney	6.6E-07	NA	1.7E-07	8.2E-07
			Dibenzo(a,h)anthracene	2.5E-09	NA	6.2E-10	NA	3.1E-09	Kidney	6.3E-08	NA	1.6E-08	7.9E-08
			Indeno(1,2,3-cd)pyrene	5.3E-10	NA	1.3E-10	NA	6.6E-10	Kidney	1.3E-07	NA	3.4E-08	1.7E-07
			Aroclor 1254	5.8E-10	NA	1.6E-10	NA	7.4E-10	Immune system	8.2E-05	NA	2.2E-05	1.0E-04
			Arsenic	8.0E-08	NA	4.6E-09	NA	8.4E-08	Skin	9.9E-04	NA	5.8E-05	1.0E-03
			Cadmium (water)	NC	NA	NC	NA		Kidney	9.8E-05	NA	3.8E-06	1.0E-04
			Chromium VI (used as Total Chromium)	NC	NA	NC	NA		NOAEL	1.3E-03	NA		1.3E-03
			Copper	NC	NA	NC	NA			--	NA		
			Lead	--	NA	--	NA			--	NA		
			Mercury (as elemental mercury)	NC	NA	NC	NA		Immune system	2.8E-05	NA		2.8E-05
			Nickel	NC	NA	NC	NA		Decreased BW/Organ wt.	1.3E-04	NA		1.3E-04
			Silver	NC	NA	NC	NA		Skin	2.8E-04	NA		2.8E-04
			2,3,7,8-TCDD	2.9E-07	NA	5.6E-10	NA	2.9E-07		--	NA	--	
			CHEMICAL TOTAL	4.1E-07	--	1.1E-08	--	4E-07		3.1E-03	0.0E+00	8.4E-05	3E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						4E-07					3E-03
	EXPOSURE MEDIUM TOTAL							4E-07					3E-03
SURFACE WATER	SURFACE WATER	INNER COVE	1,2-Dichloroethene (cis)	NC	NA	NC	NA		Hematological system	7.6E-06	NA	--	7.6E-06
			Tetrachloroethene	8.5E-11	NA	7.2E-10	NA	8.1E-10	Liver	9.3E-07	NA	7.9E-06	8.9E-06
			Trichloroethene	1.6E-09	NA	3.8E-09	NA	5.4E-09	Liver, Kidney	7.4E-05	NA	1.8E-04	2.5E-04
			Vinyl Chloride	5.5E-09	NA	4.4E-09	NA	9.9E-09	Liver	7.3E-06	NA	5.9E-06	1.3E-05
			Benzo(a)anthracene	2.3E-10	NA	4.3E-08	NA	4.3E-08	Kidney	6.0E-08	NA	1.1E-05	1.1E-05
			Benzo(a)pyrene	2.4E-09	NA	7.5E-07	NA	7.5E-07	Kidney	6.2E-08	NA	1.9E-05	1.9E-05
			Dibenzo(a,h)anthracene	2.5E-09	NA	1.2E-06	NA	1.2E-06	Kidney	6.5E-08	NA	3.1E-05	3.1E-05
			Lead	--	NA	--	NA			--	NA	--	
			2,3,7,8-TCDD	1.7E-08	NA	4.7E-06	NA	4.8E-06		--	NA	--	
			CHEMICAL TOTAL	2.9E-08	--	6.8E-06	--	7E-06		9.0E-05	0.0E+00	2.5E-04	3E-04
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						7E-06					3E-04
	EXPOSURE MEDIUM TOTAL							7E-06					3E-04
RECEPTOR TOTAL								**7E-06**					**4E-03**
							TOTAL RISK ACROSS ALL MEDIA	**7E-06**	**TOTAL HAZARD ACROSS ALL MEDIA**				**4E-03**

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: BJR
Checked by: KJC

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TOTAL HEMATOLOGICAL SYSTEM HI =	**3.0E-05**
TOTAL IMMUNE SYSTEM HI =	**1.3E-04**
TOTAL KIDNEY HI =	**1.7E-04**
TOTAL LIVER HI =	**3.6E-05**
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TOTAL NOAEL HI =	**1.3E-03**
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TOTAL SKIN HI =	**1.3E-03**
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TABLE E10 - UNCERTAINTY
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY- CURRENT/FUTURE- ADOLESCENT TRESPASSER- AGES 7-18
SUPPLEMENTAL SITE INVESTIGATION REPORT
FORMER GORHAM MANUFACTURING
333 ADELAIDE AVENUE
PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: ADOLESCENT TRESPASSER
RECEPTOR AGE: AGES 7-18

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK (1)					NON-CARCINOGENIC HAZARD QUOTIENT (1)				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	OUTER COVE	1,2-Dichloroethene (cis)	NC	NA	NC	NA		Hematological system	5.0E-08	NA		5.0E-08
			Butylbenzene, sec-	NC	NA	NC	NA		Undetermined	5.0E-08	NA		5.0E-08
			Tetrachloroethene	1.2E-11	NA	0.0E+00	NA	1.2E-11	Liver	5.0E-08	NA		5.0E-08
			Trichloroethene	8.6E-12	NA	0.0E+00	NA	8.6E-12	Liver/Kidney	1.7E-06	NA		1.7E-06
			Vinyl Chloride	6.0E-11	NA	0.0E+00	NA	6.0E-11	Liver	3.3E-07	NA		3.3E-07
			Benzo(a)anthracene	1.5E-09	NA	5.0E-10	NA	2.0E-09	Kidney	1.6E-06	NA	5.4E-07	2.2E-06
			Benzo(a)pyrene	1.9E-08	NA	6.3E-09	NA	2.6E-08	Kidney	2.1E-06	NA	6.7E-07	2.7E-06
			Benzo(b)fluoranthene	3.2E-09	NA	1.0E-09	NA	4.2E-09	Kidney	3.4E-06	NA	1.1E-06	4.5E-06
			Dibenzo(a,h)anthracene	2.4E-09	NA	7.9E-10	NA	3.2E-09	Kidney	2.6E-07	NA	8.4E-08	3.4E-07
			Indeno(1,2,3-cd)pyrene	6.3E-10	NA	2.0E-10	NA	8.3E-10	Kidney	6.7E-07	NA	2.2E-07	8.8E-07
			Aroclor 1254	6.8E-10	NA	2.4E-10	NA	9.2E-10	Immune system	4.0E-04	NA	1.4E-04	5.4E-04
			Arsenic	5.8E-08	NA	4.4E-09	NA	6.3E-08	Skin	3.0E-03	NA	2.3E-04	3.3E-03
			Cadmium (water)	NC	NA	NC	NA		Kidney	1.7E-04	NA	8.7E-06	1.8E-04
			Chromium VI (used as Total Chromium)	NC	NA	NC	NA		NOAEL	3.4E-04	NA		3.4E-04
			Copper	NC	NA	NC	NA			--	NA		
			Lead	--	NA	--	NA			--	NA		
			Mercury (as elemental mercury)	NC	NA	NC	NA		Immune system	1.6E-05	NA		1.6E-05
			Nickel	NC	NA	NC	NA		Decreased BW/Organ wt.	1.0E-04	NA		1.0E-04
			Silver	NC	NA	NC	NA		Skin	1.7E-05	NA		1.7E-05
			2,3,7,8-TCDD	6.0E-09	NA	1.5E-11	NA	6.0E-09		--	NA	--	
			CHEMICAL TOTAL	9.2E-08	--	1.3E-08	--	1E-07		4.1E-03	0.0E+00	3.8E-04	4E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-07					4E-03
	EXPOSURE MEDIUM TOTAL							1E-07					4E-03
SURFACE WATER	SURFACE WATER	OUTER COVE	1,2-Dichloroethene (cis)	NC	NA	NC	NA		Hematological system	7.5E-05	NA	--	7.5E-05
			Tetrachloroethene	1.7E-10	NA	2.2E-09	NA	2.3E-09	Liver	7.8E-06	NA	9.9E-05	1.1E-04
			Trichloroethene	2.9E-09	NA	1.1E-08	NA	1.4E-08	Liver, Kidney	5.7E-04	NA	2.1E-03	2.6E-03
			Vinyl Chloride	4.7E-09	NA	6.0E-09	NA	1.1E-08	Liver	2.6E-05	NA	3.4E-05	5.9E-05
			Benzo(a)anthracene	4.9E-10	NA	1.3E-07	NA	1.3E-07	Kidney	5.2E-07	NA	1.4E-04	1.4E-04
			Benzo(a)pyrene	4.9E-09	NA	2.2E-06	NA	2.2E-06	Kidney	5.2E-07	NA	2.4E-04	2.4E-04
			Dibenzo(a,h)anthracene	4.9E-09	NA	3.5E-06	NA	3.5E-06	Kidney	5.2E-07	NA	3.7E-04	3.7E-04
			Lead	--	NA	--	NA			--	NA	--	
			2,3,7,8-TCDD	1.3E-08	NA	5.4E-06	NA	5.4E-06		--	NA	--	
			CHEMICAL TOTAL	3.1E-08	--	1.1E-05	--	1E-05		6.8E-04	0.0E+00	3.0E-03	4E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-05					4E-03
	EXPOSURE MEDIUM TOTAL							1E-05					4E-03
RECEPTOR TOTAL								**1E-05**					**8E-03**
							TOTAL RISK ACROSS ALL MEDIA	**1E-05**	**TOTAL HAZARD ACROSS ALL MEDIA**				**8E-03**

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: BJR
Checked by: KJC

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TOTAL HEMATOLOGICAL SYSTEM HI =	**7.5E-05**
TOTAL IMMUNE SYSTEM HI =	**5.5E-04**
TOTAL KIDNEY HI =	**9.4E-04**
TOTAL LIVER HI =	**1.7E-04**
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TOTAL NOAEL HI =	**3.4E-04**
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TOTAL SKIN HI =	**3.3E-03**
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TABLE E11 - UNCERTAINTY
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY- CURRENT/FUTURE- ADULT TRESPASSER- AGES 19-30
SUPPLEMENTAL SITE INVESTIGATION REPORT
FORMER GORHAM MANUFACTURING
333 ADELAIDE AVENUE
PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: ADULT TRESPASSER
RECEPTOR AGE: AGES 19-30

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK (1)					NON-CARCINOGENIC HAZARD QUOTIENT (1)				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	OUTER COVE	1,2-Dichloroethene (cis)	NC	NA	NC	NA		Hematological system	3.2E-08	NA		3.2E-08
			Butylbenzene, sec-	NC	NA	NC	NA		Undetermined	3.2E-08	NA		3.2E-08
			Tetrachloroethene	9.9E-12	NA	0.0E+00	NA	9.9E-12	Liver	3.2E-08	NA		3.2E-08
			Trichloroethene	7.4E-12	NA	0.0E+00	NA	7.4E-12	Liver/Kidney	1.1E-06	NA		1.1E-06
			Vinyl Chloride	5.2E-11	NA	0.0E+00	NA	5.2E-11	Liver	2.2E-07	NA		2.2E-07
			Benzo(a)anthracene	1.3E-09	NA	5.9E-10	NA	1.9E-09	Kidney	1.1E-06	NA	4.7E-07	1.5E-06
			Benzo(a)pyrene	1.7E-08	NA	7.3E-09	NA	2.4E-08	Kidney	1.3E-06	NA	5.8E-07	1.9E-06
			Benzo(b)fluoranthene	2.7E-09	NA	1.2E-09	NA	3.9E-09	Kidney	2.2E-06	NA	9.6E-07	3.1E-06
			Dibenzo(a,h)anthracene	2.1E-09	NA	9.2E-10	NA	3.0E-09	Kidney	1.7E-07	NA	7.3E-08	2.4E-07
			Indeno(1,2,3-cd)pyrene	5.4E-10	NA	2.4E-10	NA	7.7E-10	Kidney	4.3E-07	NA	1.9E-07	6.2E-07
			Aroclor 1254	5.9E-10	NA	2.8E-10	NA	8.6E-10	Immune system	2.6E-04	NA	1.2E-04	3.8E-04
			Arsenic	5.0E-08	NA	5.1E-09	NA	5.5E-08	Skin	1.9E-03	NA	2.0E-04	2.1E-03
			Cadmium (water)	NC	NA	NC	NA		Kidney	1.1E-04	NA	7.6E-06	1.2E-04
			Chromium VI (used as Total Chromium)	NC	NA	NC	NA		NOAEL	2.2E-04	NA		2.2E-04
			Copper	NC	NA	NC	NA			--	NA		
			Lead	--	NA	--	NA			--	NA		
			Mercury (as elemental mercury)	NC	NA	NC	NA		Immune system	1.1E-05	NA		1.1E-05
			Nickel	NC	NA	NC	NA		Decreased BW/Organ wt.	6.4E-05	NA		6.4E-05
			Silver	NC	NA	NC	NA		Skin	1.1E-05	NA		1.1E-05
			2,3,7,8-TCDD	5.1E-09	NA	1.7E-11	NA	5.1E-09		--	NA	--	
			CHEMICAL TOTAL	7.9E-08	--	1.6E-08	--	9E-08		2.6E-03	0.0E+00	3.3E-04	3E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						9E-08					3E-03
	EXPOSURE MEDIUM TOTAL							9E-08					3E-03
SURFACE WATER	SURFACE WATER	OUTER COVE	1,2-Dichloroethene (cis)	NC	NA	NC	NA		Hematological system	4.8E-05	NA	--	4.8E-05
			Tetrachloroethene	1.5E-10	NA	2.5E-09	NA	2.7E-09	Liver	5.0E-06	NA	8.7E-05	9.2E-05
			Trichloroethene	2.5E-09	NA	1.3E-08	NA	1.5E-08	Liver, Kidney	3.7E-04	NA	1.8E-03	2.2E-03
			Vinyl Chloride	4.0E-09	NA	7.1E-09	NA	1.1E-08	Liver	1.7E-05	NA	3.0E-05	4.6E-05
			Benzo(a)anthracene	4.2E-10	NA	1.5E-07	NA	1.5E-07	Kidney	3.3E-07	NA	1.2E-04	1.2E-04
			Benzo(a)pyrene	4.2E-09	NA	2.6E-06	NA	2.6E-06	Kidney	3.3E-07	NA	2.1E-04	2.1E-04
			CHEMICAL TOTAL	2.6E-08	--	1.3E-05	--	1E-05		4.4E-04	0.0E+00	2.6E-03	3E-03
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						1E-05					3E-03
	EXPOSURE MEDIUM TOTAL							1E-05					3E-03
RECEPTOR TOTAL								**1E-05**					**6E-03**
							TOTAL RISK ACROSS ALL MEDIA	**1E-05**	**TOTAL HAZARD ACROSS ALL MEDIA**				**6E-03**

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: BJR
Checked by: KJC

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TOTAL HEMATOLOGICAL SYSTEM HI =	**4.8E-05**
TOTAL IMMUNE SYSTEM HI =	**3.9E-04**
TOTAL KIDNEY HI =	**7.8E-04**
TOTAL LIVER HI =	**1.4E-04**
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TOTAL NOAEL HI =	**2.2E-04**
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TOTAL SKIN HI =	**2.2E-03**
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TABLE E12 - UNCERTAINTY
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CENTRAL TENDENCY- CURRENT/FUTURE- COMMERCIAL/INDUSTRIAL WORKER- ADULT
SUPPLEMENTAL SITE INVESTIGATION REPORT
FORMER GORHAM MANUFACTURING
333 ADELAIDE AVENUE
PROVIDENCE, RHODE ISLAND

SCENARIO TIMEFRAME: CURRENT/FUTURE
RECEPTOR POPULATION: COMMERCIAL/INDUSTRIAL WORKER
RECEPTOR AGE: ADULT

MEDIUM	EXPOSURE MEDIUM	EXPOSURE POINT	CHEMICAL	CARCINOGENIC RISK (1)					NON-CARCINOGENIC HAZARD QUOTIENT (1)				
				INGESTION	INHALATION	DERMAL	EXTERNAL (RADIATION)	EXPOSURE ROUTES TOTAL	PRIMARY TARGET ORGAN	INGESTION	INHALATION	DERMAL	EXPOSURE ROUTES TOTAL
SEDIMENT	SEDIMENT	OUTER COVE	1,2-Dichloroethene (cis)	NC	NA	NC	NA		Hematological system	4.0E-09	NA		4.0E-09
			Butylbenzene, sec-	NC	NA	NC	NA		Undetermined	4.0E-09	NA		4.0E-09
			Tetrachloroethene	3.9E-12	NA	0.0E+00	NA	3.9E-12	Liver	4.0E-09	NA		4.0E-09
			Trichloroethene	2.9E-12	NA	0.0E+00	NA	2.9E-12	Liver/Kidney	1.3E-07	NA		1.3E-07
			Vinyl Chloride	2.0E-11	NA	0.0E+00	NA	2.0E-11	Liver	2.7E-08	NA		2.7E-08
			Benzo(a)anthracene	5.2E-10	NA	1.3E-10	NA	6.5E-10	Kidney	1.3E-07	NA	3.3E-08	1.7E-07
			Benzo(a)pyrene	6.5E-09	NA	1.6E-09	NA	8.1E-09	Kidney	1.7E-07	NA	4.2E-08	2.1E-07
			Benzo(b)fluoranthene	1.1E-09	NA	2.7E-10	NA	1.3E-09	Kidney	2.7E-07	NA	6.8E-08	3.4E-07
			Dibenzo(a,h)anthracene	8.1E-10	NA	2.0E-10	NA	1.0E-09	Kidney	2.1E-08	NA	5.2E-09	2.6E-08
			Indeno(1,2,3-cd)pyrene	2.1E-10	NA	5.3E-11	NA	2.6E-10	Kidney	5.4E-08	NA	1.4E-08	6.7E-08
			Aroclor 1254	2.3E-10	NA	6.2E-11	NA	2.9E-10	Immune system	3.2E-05	NA	8.7E-06	4.1E-05
			Arsenic	2.0E-08	NA	1.1E-09	NA	2.1E-08	Skin	2.4E-04	NA	1.4E-05	2.6E-04
			Cadmium (water)	NC	NA	NC	NA		Kidney	1.4E-05	NA	5.4E-07	1.4E-05
			Chromium VI (used as Total Chromium)	NC	NA	NC	NA		NOAEL	2.7E-05	NA		2.7E-05
			Copper	NC	NA	NC	NA			--	NA		
			Lead	--	NA	--	NA			--	NA		
			Mercury (as elemental mercury)	NC	NA	NC	NA		Immune system	1.3E-06	NA		1.3E-06
			Nickel	NC	NA	NC	NA		Decreased BW/Organ wt.	8.1E-06	NA		8.1E-06
			Silver	NC	NA	NC	NA		Skin	1.4E-06	NA		1.4E-06
			2,3,7,8-TCDD	2.0E-09	NA	3.9E-12	NA	2.0E-09		--	NA	--	
			CHEMICAL TOTAL	3.1E-08	--	3.5E-09	--	3E-08		3.3E-04	0.0E+00	2.4E-05	4E-04
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						3E-08					4E-04
	EXPOSURE MEDIUM TOTAL							3E-08					4E-04
SURFACE WATER	SURFACE WATER	OUTER COVE	1,2-Dichloroethene (cis)	NC	NA	NC	NA		Hematological system	8.0E-06	NA	--	8.0E-06
			Tetrachloroethene	7.6E-11	NA	6.5E-10	NA	7.2E-10	Liver	8.3E-07	NA	7.1E-06	7.9E-06
			Trichloroethene	1.3E-09	NA	3.1E-09	NA	4.4E-09	Liver, Kidney	6.1E-05	NA	1.5E-04	2.1E-04
			Vinyl Chloride	2.1E-09	NA	1.7E-09	NA	3.7E-09	Liver	2.8E-06	NA	2.2E-06	5.0E-06
			Benzo(a)anthracene	2.2E-10	NA	3.9E-08	NA	4.0E-08	Kidney	5.5E-08	NA	1.0E-05	1.0E-05
			Benzo(a)pyrene	2.2E-09	NA	6.7E-07	NA	6.7E-07	Kidney	5.5E-08	NA	1.7E-05	1.7E-05
			Dibenzo(a,h)anthracene	2.2E-09	NA	1.0E-06	NA	1.0E-06	Kidney	5.5E-08	NA	2.7E-05	2.7E-05
			Lead	--	NA	--	NA			--	NA	--	
			2,3,7,8-TCDD	5.7E-09	NA	1.6E-06	NA	1.6E-06		--	NA	--	
			CHEMICAL TOTAL	1.4E-08	--	3.4E-06	--	3E-06		7.3E-05	0.0E+00	2.1E-04	3E-04
			RADIONUCLIDE TOTAL										
		EXPOSURE POINT TOTAL						3E-06					3E-04
	EXPOSURE MEDIUM TOTAL							3E-06					3E-04
RECEPTOR TOTAL								**3E-06**					**6E-04**
							TOTAL RISK ACROSS ALL MEDIA	**3E-06**	**TOTAL HAZARD ACROSS ALL MEDIA**				**6E-04**

NOTES:
NC - Not carcinogenic by this exposure route.
NA - Not applicable; exposure route not applicable for this chemical/exposure medium.
-- - Not calculated; dose-response data and/or dermal absorption values are not available.

Prepared by: BJR
Checked by: KJC

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TOTAL HEMATOLOGICAL SYSTEM HI =	**8.0E-06**
TOTAL IMMUNE SYSTEM HI =	**4.2E-05**
TOTAL KIDNEY HI =	**6.9E-05**
TOTAL LIVER HI =	**1.3E-05**
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TOTAL NOAEL HI =	**2.7E-05**
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TOTAL SKIN HI =	**2.6E-04**
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Table E13 - UNCERTAINTY
Risk Assessment Summary - CT
Supplemental Site Investigation Report
Former Gorham Manufacturing
333 Adelaide Avenue
Providence, Rhode Island

Exposure Scenario	Receptor	Exposure Point	Exposure Route	Excess Lifetime Cancer Risk	Hazard Index
Current/Future - Inner Cove					
Trespasser	Older Child (ages 7 through 18)	Sediment	Incidental ingestion	1E-06	0.04
			Dermal contact	4E-08	0.001
		Surface water	Incidental ingestion	7E-08	0.0008
			Dermal contact	2E-05	0.004
			Total Risk:	**2E-05**	**0.04**
Trespasser	Adult (ages 19 and above)	Sediment	Incidental ingestion	1E-06	0.03
			Dermal contact	5E-08	0.001
		Surface water	Incidental ingestion	6E-08	0.0005
			Dermal contact	3E-05	0.003
			Total Risk:	**3E-05**	**0.03**
			Total Receptor Risk:	**5E-05**	**NC**
Commercial/Industrial Worker	Adult (ages 19 and above)	Sediment	Incidental ingestion	4E-07	0.003
			Dermal contact	1E-08	0.00008
		Surface water	Incidental ingestion	3E-08	0.00009
			Dermal contact	7E-06	0.0003
			Total Risk:	**7E-06**	**0.004**
			Total Receptor Risk:	**7E-06**	**NC**

Table E13 - UNCERTAINTY
Risk Assessment Summary - CT
Supplemental Site Investigation Report
Former Gorham Manufacturing
333 Adelaide Avenue
Providence, Rhode Island

Exposure Scenario	Receptor	Exposure Point	Exposure Route	Excess Lifetime Cancer Risk	Hazard Index
Current/Future - Outer Cove					
Trespasser	Older Child (ages 7 through 18)	Sediment	Incidental ingestion	9E-08	0.004
			Dermal contact	1E-08	0.0004
		Surface water	Incidental ingestion	3E-08	0.0007
			Dermal contact	1E-05	0.003
			Total Risk:	**1E-05**	**0.008**
Trespasser	Adult (ages 19 and above)	Sediment	Incidental ingestion	8E-08	0.003
			Dermal contact	2E-08	0.0003
		Surface water	Incidental ingestion	3E-08	0.0004
			Dermal contact	1E-05	0.003
			Total Risk:	**1E-05**	**0.006**
			Total Receptor Risk:	**2E-05**	**NC**
Commercial/Industrial Worker	Adult (ages 19 and above)	Sediment	Incidental ingestion	3E-08	0.0003
			Dermal contact	3E-09	0.00002
		Surface water	Incidental ingestion	1E-08	0.0001
			Dermal contact	3E-06	0.0002
			Total Risk:	**3E-06**	**0.0006**
			Total Receptor Risk:	**3E-06**	**NC**

Risk calculations are presented in Tables E1-E12.
NC = Not calculated because Hazard Index is not summed across age groups.

Table E14 - UNCERTAINTY
Risk Assessment Summary - RME
Supplemental Site Investigation Report
Former Gorham Manufacturing
333 Adelaide Avenue
Providence, Rhode Island

Exposure Scenario	Receptor	Exposure Point	Exposure Route	Excess Lifetime Cancer Risk	Hazard Index
Current/Future - Inner Cove					
Trespasser	Older Child (ages 7 through 18)	Sediment	Incidental ingestion	2E-05	0.1
			Dermal contact	5E-07	0.003
		Surface water	Incidental ingestion	5E-07	0.001
			Dermal contact	2E-04	0.005
			Total Risk:	**2E-04**	**0.2**
Trespasser	Adult (ages 19 and above)	Sediment	Incidental ingestion	1E-05	0.09
			Dermal contact	4E-07	0.003
		Surface water	Incidental ingestion	3E-07	0.0009
			Dermal contact	1E-04	0.004
			Total Risk:	**1E-04**	**0.1**
			Total Receptor Risk:	**3E-04**	**NC**
Commercial/Industrial Worker	Adult (ages 19 and above)	Sediment	Incidental ingestion	4E-06	0.02
			Dermal contact	8E-08	0.0003
		Surface water	Incidental ingestion	2E-08	0.00002
			Dermal contact	4E-05	0.0006
			Total Risk:	**5E-05**	**0.02**
			Total Receptor Risk:	**5E-05**	**NC**

Table E14 - UNCERTAINTY
Risk Assessment Summary - RME
Supplemental Site Investigation Report
Former Gorham Manufacturing
333 Adelaide Avenue
Providence, Rhode Island

Exposure Scenario	Receptor	Exposure Point	Exposure Route	Excess Lifetime Cancer Risk	Hazard Index
Current/Future - Pond (Outer Cove)					
Trespasser	Older Child (ages 7 through 18)	Sediment	Incidental ingestion	1E-06	0.01
			Dermal contact	2E-07	0.001
		Surface water	Incidental ingestion	2E-07	0.002
			Dermal contact	5E-05	0.006
			Total Risk:	**5E-05**	**0.02**
Trespasser	Adult (ages 19 and above)	Sediment	Incidental ingestion	9E-07	0.009
			Dermal contact	2E-07	0.001
		Surface water	Incidental ingestion	1E-07	0.001
			Dermal contact	4E-05	0.005
			Total Risk:	**5E-05**	**0.02**
			Total Receptor Risk:	**1E-04**	**NC**
Commercial/Industrial Worker	Adult (ages 19 and above)	Sediment	Incidental ingestion	3E-07	0.001
			Dermal contact	4E-08	0.00009
		Surface water	Incidental ingestion	6E-09	0.0000
			Dermal contact	1E-05	0.001
			Total Risk:	**1E-05**	**0.002**
			Total Receptor Risk:	**1E-05**	**NC**

Risk calculations are presented in Tables E1-E12.
NC = Not calculated because Hazard Index is not summed across age groups.