FOR PLACEMENT IN THE ADMINISTRATIVE RECORD

Centredale Manor Restoration Project Superfund Site

Comments of Emhart Industries, Inc. on U.S. EPA's Proposed Remedial Action Plan (October 2011), Addendum to the Interim Final Feasibility Study Report (September 2011), and Interim Final Feasibility Study Report (April 30, 2010)

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Centredale Manor Restoration Project Superfund Site - Comments of Emhart Industries, Inc. on U.S. EPA's Proposed Remedial Action Plan (October 2011), Addendum to the Interim Final Feasibility Study Report (September 2011), and Interim Final Feasibility Study Report (April 30, 2010)

Executive Summary

Introduction

Emhart Industries, Inc. ("Emhart") requests that the comments provided herein, the enclosed Index of cited documents, and the documents on the enclosed CD, be included on the administrative record for the Centredale Manor Restoration Project Superfund Site ("Site").

In the Proposed Remedial Action Plan ("PRAP"), United States Environmental Protection Agency ("EPA") has proposed remedies for each of five "action areas" deemed by EPA to require some level of cleanup. The five action areas at the Site are denominated by EPA as: (1) Allendale and Lyman Mill Reach Sediment; (2) Allendale Reach Floodplain Soil; (3) Lyman Mill Reach Stream Sediment and Floodplain Soil (the "Oxbow Area"); (4) Source Area Soil; and (5) Source Area Groundwater.[1,2] Emhart has identified significant flaws in the PRAP for each of these action areas. In the event of judicial review, EPA's remedy selection process will be evaluated based on the information in the administrative record. The comments provided herein include abundant factual and legal evidence from the administrative record to support a judicial finding that EPA's PRAP, if selected for implementation at the Site, is "arbitrary and capricious or otherwise not in accordance with law," the standard of review under Section

[1] Please note that throughout this document, defined terms are designated by capitalization. For example, Source Area Groundwater and Source Area Soil are EPA defined terms and are capitalized when referring to the particular action area. However, when a term such as "source area soil" is not capitalized, it refers to the soil that is present in the Source Area Soil action area or also may be present in the Source Area Groundwater action area.
[2] Please also note that the defined terms are listed in a Glossary at the end of this Executive Summary.

113(j)(2) of the Comprehensive Environmental Response, Compensation and Liability Act ("Superfund" or "CERCLA").[3]

Since being notified of its status as a potentially responsible party ("PRP") at the Site, Emhart has commenced litigation and established evidence demonstrating that the Site contamination resulted from New England Container Company's ("NECC") drum reconditioning operation, and not from the operations of Emhart's alleged predecessor, Metro-Atlantic, Inc. *See Emhart Indus., Inc. v. NECC*, C.A. 06-0218-S (D.R.I. 2006); *see also Emhart Indus., Inc. v. U.S. Dep't of the Air Force, et al.*, C.A. 11-023-S (D.R.I. 2011). This evidence, which is partially summarized in Appendix A and incorporated herein by reference, not only negates Emhart's alleged responsibility for Site clean-up, it also disproves EPA's conceptual site model, thus undermining the validity of EPA's PRAP.

EPA's failure to conform its outdated and inaccurate conceptual site model to the current evidentiary record is contrary to its own regulations set forth in the National Contingency Plan ("NCP"), and results in a flawed analysis of the remedial alternatives considered in the Feasibility Study and selected by EPA in the PRAP. EPA's reliance on its inaccurate conceptual site model has led it, in turn, to incorrectly deem contaminated environmental media at the Site to be a RCRA-listed F020 waste. This faulty designation, as well as its unsupported decision to classify all source area soils, floodplain soil, and pond sediments at the reaches of Allendale and Lyman Mill as principal threat waste ("PTW"), has led EPA to further incorporate into its

[3] A summary of the applicable laws, regulations, and guidance documents is included in Appendix B to these comments. These include, but are not limited to, CERCLA, the NCP, EPA guidance documents such as "Principles for Managing Contaminated Sediments," and other Applicable or Relevant and Appropriate Requirements ("ARARs").

evaluation of the remedial alternatives mistaken assumptions regarding the requirements for and costs of addressing contaminated environmental media at the Site.

The significant flaws in the analysis underlying EPA's remedy selection process have resulted in a PRAP that favors remedial alternatives that are contrary to CERCLA and the NCP. For example, with respect to Allendale and Lyman Mill Reach Sediment, the PRAP reflects an apparent preference for excavation of potentially enormous quantities of sediment and disposal at an off-Site location, contrary to both legal requirements under CERCLA and significant considerations regarding technical implementability and impracticability. The remedies proposed by EPA for both Allendale Reach Floodplain Soil and Lyman Mill Reach Stream Sediment and Floodplain Soil pose the same concerns.

With respect to the Source Area Soil, EPA has proposed a capping remedy that meets or exceeds the requirements for closure of a hazardous waste landfill under Subtitle C of the Resource Conservation and Recovery Act ("RCRA"). However, the impacted soils at issue are not considered to be a waste at all under EPA's own regulations, policy, and guidance documents, and therefore are not subject to the unduly stringent (and costly) RCRA Subtitle C closure requirements that EPA would seek to impose.

In short, due to its erroneous analytical framework, EPA fails to comply with applicable laws, regulations, policy, and guidance, and take into account the current administrative record. Accordingly, the PRAP does not reflect a complete, accurate, fair and reasoned assessment by EPA of the remedial alternatives for the five designated action areas of the Site.

Site Background

The Site consists of two parcels located at 2072 and 2074 Smith Street (the "Peninsula") in North Providence, Rhode Island, and downstream areas that EPA alleges have been impacted

by activities conducted historically on the two parcels. Currently, there are two high-rise apartment buildings, known as Brook Village and Centredale Manor, on the parcels. On the eastern portion of the Peninsula is a drainage swale or "tail race" that empties into a wooded wetland to the south. The Woonasquatucket River (the "River") flows along the western portion of the Peninsula. CERCLA hazardous substances, including volatile organic compounds ("VOCs"), dioxins, polychlorinated biphenyls ("PCBs"), metals, pesticides, and herbicides, have been identified in soil, sediment, and groundwater at the Site.

EPA alleges that historic drum reconditioning and chemical manufacturing operations on the Peninsula were the principal contributors to contamination on the Site. Between approximately 1952 and 1972, NECC operated a steel drum reconditioning business on the Peninsula, which included an incinerator to burn residue and paint from inside 55-gallon open-head steel drums and a caustic bath process for cleaning the inside of 55-gallon closed-head drums. These NECC operations were situated near the tail race on the eastern side of the Peninsula. NECC also stored drums to the south and west of the buildings in which it conducted its drum cleaning operations, extending over to the western area of the Peninsula adjacent to the River. As a result of these and other activities conducted by NECC relating to its drum reconditioning business, a number of CERCLA hazardous substances were released or disposed of throughout the Site, including dioxins, PCBs, pesticides, and herbicides.

In approximately 1944, Atlantic Chemical Company ("Atlantic Chemical") began operations on the Peninsula, producing textile chemicals including defoamers, fire retardants, dye fixatives, water repellants, resins, cotton-softeners, powdered soaps, a metal stripper, and sulfonated tallow for wool. In 1953, Atlantic Chemical changed its name to Metro-Atlantic, Inc. ("Metro-Atlantic"), and continued to operate on the Peninsula until approximately 1968. For a

period of less than one year in the mid-1960s, Metro-Atlantic manufactured Hexachlorophene ("HCP") in a building separate from its main operation and located on the west side of the Peninsula. EPA has alleged that Metro-Atlantic's HCP operation resulted in the release of dioxins at the Site and, therefore, that dioxin-contaminated environmental media at the Site must be handled as a RCRA-listed F020 waste. Emhart is the alleged successor to Metro-Atlantic.

Emhart's History of Cooperation with EPA

Since 2000, Emhart has worked with EPA in good faith to establish a cleanup approach for the Site that is cost-effective, implementable, and fully protective of human health and the environment. At the same time, Emhart has pursued litigation against NECC which has resulted in a vastly-expanded factual record regarding historical operations on the Site and which demonstrates the incompleteness and inaccuracy of EPA's current conceptual site model.

Between 2000 and 2006, Emhart and other PRPs completed three removal actions at the Site. In 2000, Emhart and other PRPs installed a temporary soil cap and implemented limited flood control measures at the Site under the direction of EPA. Beginning in 2001, Emhart and other PRPs performed additional cleanup measures at the Site under the direction of EPA, including restoring Allendale Dam, sampling residential soils and shoreline sediments, and excavating such soils and sediments containing greater than one part per billion ("ppb") of dioxin. In September 2003, Emhart and other PRPs conducted a third removal action at the Site under the direction of EPA, to address contaminated soils and sediments in the vicinity of the tail race.

In 2007 and 2008, Emhart performed hydrodynamic modeling of certain remedial alternatives and a comparative ecological risk assessment under the direction of EPA to supplement the Feasibility Study ("FS"). In 2009 and 2010, Emhart performed a removal action in the Source Area Groundwater action area under the direction of EPA, which involved

excavation and off-site disposal of delineated soils and sediments and the installation of an impermeable cap.

In June 2010, Emhart performed a supplemental investigation of the Oxbow Area under the direction of EPA. The purpose of this investigation was to collect additional data necessary to permit EPA to: (1) properly evaluate the remedial alternatives set forth in the Interim Final Feasibility Study Report ("FS Report"); (2) analyze potential risks to human health and the environment; and (3) select the most appropriate remedial alternative for the Oxbow Area in the PRAP based on more complete information.

Contemporaneous with its efforts outlined above to cooperate with EPA, Emhart submitted to EPA extensive evidentiary material for inclusion in the administrative record for the Site and requested that EPA update its original conceptual site model to reflect the new information. As explained in the following sections, EPA fails to consider the new information or to update its conceptual model for the Site and, in so doing, acts in an arbitrary and capricious manner and contrary to the requirements of the NCP and other governing law.

Discussion of Remedial Alternatives

EPA's evaluation of remedial alternatives and its selection of proposed remedies for the various action areas of the Site, as presented in the FS and the PRAP, suffers from major deficits, including the following:

- EPA's conceptual site model for the Site is static, outdated, and factually erroneous. Further, it is inconsistent with and not supported by information in the administrative record.
- EPA incorrectly deems all contaminated environmental media at the Site to be a RCRA-listed F020 waste. The contaminants in environmental media at the Site

cannot be traced to a release of waste from any single original process meeting any listing description. Further, EPA's decision to apply the F020 waste listing to historic contamination at the Site is inconsistent with the Agency's approach at other remediation sites where dioxin is a contaminant of concern. Finally, EPA inconsistently classifies contaminated environmental media at various locations at the Site and thereby misapplies RCRA, resulting in EPA proposing more costly remedial alternatives for the various action areas than are necessary or permissible.

- EPA fails to meet the requirements of the Information Quality Act ("IQA") by omitting information and data concerning changed Site conditions.
- EPA inadequately defines the dioxin goals for the Site, relying on upstream background concentrations that are uncertain, and improperly considers speculative future changes to the Preliminary Remediation Goals ("PRGs") for dioxins and dioxin-like contaminants in soils, rather than evaluating the remedial alternatives based on current requirements.
- EPA fails to adequately define the volume of soil and sediment requiring excavation and disposal in a confined disposal facility ("CDF") or other off-Site location(s) under several of the remedial alternatives and the remedy selected in the PRAP, which creates substantial uncertainty regarding the cost and implementability of these remedial alternatives and the selected remedy in the PRAP.

With regard to each of the five action areas at the Site, EPA improperly "screens out" or rejects otherwise cost-effective, protective, and implementable remedial alternatives, as discussed below:

- For the **Allendale and Lyman Mill Sediment** action area:

- EPA improperly relies on Executive Order ("EO") 11988 to reject the nearshore CDF remedial alternative. EO 11988 is not an absolute prohibition against siting a remedy in a floodplain; it applies only where the action under consideration would adversely affect the floodplain. Here, hydrodynamic modeling demonstrates that the nearshore CDF remedial alternative would have negligible effect on the floodplain and floodplain inundation.
- EPA improperly screens out, without substantive consideration, the channel-only configuration for pond remediation, based on the supposition that there would be community opposition. However, EPA cannot apply the community acceptance criterion under the NCP to eliminate an otherwise acceptable remedial alternative at the "screening" phase of the FS; rather, EPA must first apply the two threshold and five primary balancing criteria under the NCP. *See* Appendix B at Section A.2.b. In fact, EPA does not apply the community acceptance criterion under the NCP to remedial alternatives that it favors, such as the upland CDF alternative, with respect to which community opposition is well-documented.
- EPA selects the upland CDF as the disposal alternative in the PRAP, despite the refusal of the Town of Johnston's Mayor to authorize the siting of a hazardous waste landfill within the Town. EPA does not identify in the record any alternative locations for siting an upland CDF, thus failing to satisfy the primary balancing criterion under the NCP of "implementability." Moreover, setting aside the Town of Johnston's refusal to site a hazardous waste landfill in their community, EPA fails to address key uncertainties regarding the

unpredictable – and potentially high – volume of material to be landfilled, the cost of the upland CDF disposal option, and the potential unavailability of off-Site disposal capacity. In particular, EPA fails to recognize that the remedial alternatives evaluated and the remedy selected in the PRAP that incorporate the use of an upland CDF are technically impracticable given the significant uncertainties concerning fundamental elements, including the following: (1) the volume of contaminated soil and sediment to be excavated and disposed; (2) the availability for purchase and the price of properties upon which to construct the upland CDF(s); (3) the ability to obtain a Land Disposal Restriction ("LDR") treatability variance, if necessary; (4) whether the upland CDF(s) would be deemed "on-Site" for purpose of CERCLA's permitting exemptions; (5) the suitability and sufficiency of space to construct an upland CDF(s) of requisite capacity; and (6) the practicability of conducting confirmatory sampling to establish the adequacy of the cleanup.

- Off-Site disposal is not a feasible option because off-Site facilities may not be able to accept the volume of excavated material at the time that the remedy selected in the PRAP is implemented, and because the selected remedy undermines EPA's extensive efforts to promote green remediation.
- EPA fails to explain how soil and sediment will be segregated on a concentration basis. The sediments that may be landfilled in the proposed upland CDF(s) cannot be identified. Further, EPA's estimate that only 10% of the soil and sediment will exceed the alternative treatment standards for soil must be reconsidered because it is based on inadequate data.

- EPA's conceptual site model for the Allendale and Lyman Mill Pond sediments fails to consider certain potential transport pathways. EPA's comparative assessment of the long-term effectiveness of the selected remedy is incomplete, flawed, and fails to conform to the NCP requirements.

Concomitantly, Emhart's recommended approach, which involves the placement of excavated soils and sediments into a nearshore CDF or isolation caps within the footprints of the ponds, is the most protective, implementable, and cost-effective disposal option for soils and sediments to be excavated at the Site.

- For the **Allendale Reach Floodplain Soil** action area, EPA's location-specific analysis is flawed and fails to conform to the NCP requirements for the same reasons and in the same manner as the analysis of alternatives for the Allendale and Lyman Mill Sediment action area, as discussed above.
- For the **Lyman Mill Reach Stream Sediment and Floodplain Soil** action area (the "Oxbow Area"):
  - EPA inappropriately overstates the area requiring remediation. First, EPA mischaracterizes the floodplain soil near Falco Street as a high value ecological area, which actually is part of the manicured residential backyards. Second, EPA's flawed ecological risk assessment leads the Agency to mistakenly identify the floodplain soil at the confluence of Assapumpset Brook and Lyman Mill Pond as a remediation area, even though that area poses less ecological risk to receptors than background soils.
  - EPA's conceptual site model for the Oxbow Area is not based on any measured or modeled data, but instead on mere unsupported speculation.

Further, EPA's assessment of the short- and long-term effectiveness of the remedial alternatives and the remedy selected in the PRAP for the Oxbow Area is flawed and contrary to the NCP requirements due to the Agency's inconsistent use of information in its conceptual site model.

- For the **Source Area Soil** action area:
  - EPA incorrectly applies RCRA closure requirements to contaminated environmental, in-place media, which are not hazardous waste subject to RCRA regulation.
  - EPA concludes that Source Area soil, floodplain soil and pond sediment at the reaches of Allendale and Lyman Mill are PTW, despite the absence of evidence in the administrative record to support that conclusion as it relates either to magnetic anomalies found in preliminary testing, or PCBs found in soil samples. EPA cannot determine whether a waste is PTW because the physical/chemical characteristics of the wastes in this area of the Site are unknown.
  - In the Addendum to the FS Report ("Addendum"), EPA amends the definition and scope of PTW at the Site to include all Source Area soil, and floodplain soil and pond sediment at the reaches of Allendale and Lyman Mill. However, EPA provides no basis for characterizing these environmental media as PTW, thus failing to meet the requirements of the NCP. EPA further fails to acknowledge that these impacted environmental media can be safely contained under a cap, as it previously has done at numerous other sites, and that treatment for all waste is not appropriate or necessary to protect human

health and the environment. These environmental media are not waste, and therefore no preference exists for treatment in the NCP.

- EPA misapplies RCRA and concludes without any substantiation that PTW is present in the Source Area Soil action area. Thus, EPA screens out Emhart's recommended approach, Alternative 2 – long-term monitoring and maintenance of the existing surfaces. With modification, this approach will adequately address, at a far lower cost, both EPA's concerns regarding contaminants present in the soil at concentrations that may trigger Rhode Island's GB leachability criteria, and meeting Toxic Substance Control Act ("TSCA") closure requirements. In fact, Alternative 2, if modified, is fully protective of human health and the environment, implementable, and cost-effective.
- EPA does not adequately or fully consider the short- and long- term human health impacts on the residents of the Brook Village and Centredale Manor apartments of the remedy selected in the PRAP. Due to the potential significant risks from exposure to impacted soils and sediments, it would be necessary to relocate the residents of the two apartment buildings during implementation of EPA's selected remedy. In addition to the human health impacts, EPA fails to consider the costs of such relocation, or that monitoring and maintaining the existing caps is equally protective of human health and the environment and is implementable with minimal disturbance to the residents.

o For the **Source Area Groundwater** action area:

- In 2009/2010, Emhart performed an EPA-approved excavation and dewatering removal action. The removal action was conducted to address EPA's assumption in its conceptual site model that dioxins are migrating in groundwater toward and into the River via facilitated or colloidal transport mechanisms beneath the approximately 0.13 acres on the west side of the Brook Village parking lot. EPA acknowledges that the removal action successfully remediated the shallow groundwater condition, as all the Agency's Remedial Action Objectives ("RAOs") were met.
- In the FS Report, EPA evaluates no fewer than five remedial alternatives, each of which is solely aimed at remediating the shallow groundwater area that EPA already agreed is adequately addressed by Emhart's performance of the removal action.
- These remedial alternatives initially were evaluated based on Rhode Island's classification of the Site groundwater under state law as not a potential source of drinking water. However, in response to the comments of the Agency's National Remedy Review Board ("NRRB"), in the FS Report, EPA instead classifies the groundwater within the Source Area Groundwater action area under federal law. Moreover, rather than similarly classifying the groundwater under federal law as Class III (Not a Potential Source of Drinking Water and/or of Limited Beneficial Use), EPA classifies it as Class IIB (Potential Source of Drinking Water). As a result, federal drinking water standards are Applicable or Relevant and Appropriate Requirements ("ARARs") at the source area.

- In the Addendum, EPA also revises the RAOs within the Source Area Groundwater action area to prevent exposure to contamination in groundwater in excess of federal Maximum Contaminant Levels ("MCLs") and/or non-zero MCL goals ("MCLGs") for drinking water. Further, EPA expands the area proposed for post-remediation monitoring from 0.13 acres (the area covered by the removal action) to 8.0 acres (the groundwater beneath the entire Peninsula) and establishes a "point of compliance" boundary at the downgradient edge of the Peninsula. Notwithstanding the foregoing, in the Addendum EPA fails to similarly revise its assessment of the remedial alternatives for groundwater, including the remedy selected in the PRAP.
- In the PRAP, EPA selects the excavation and dewatering alternative previously performed by Emhart, and also requires periodic testing to confirm that Site-related groundwater at the point of compliance does not exceed federal drinking water standards. However, EPA already knows, based on the most recent groundwater data (2002 data), that contaminant concentrations at the point of compliance exceed the newly imposed federal drinking water standards.
- The removal action is not intended to, nor will it, address the groundwater beneath the entire Peninsula that contains contaminant concentrations in excess of the newly-imposed federal drinking water standards.
- Given that the remedial alternatives evaluated and the remedy selected in the PRAP by EPA are premised on the groundwater being classified as not a potential drinking water source, the administrative record fails to identify the

purpose of the post-remediation monitoring requirement or the manner in which EPA plans to use the data.

- EPA's analysis of this action area is flawed. Contrary to the NCP requirements, EPA changes the groundwater classification without supporting information in the administrative record, and further fails to evaluate the effect of that decision on the remedial alternatives in the FS. Also, in the PRAP, EPA selects a remedy for the Source Area Groundwater action area without explaining either how the proposed remedy is expected to meet the newly assigned RAOs or how EPA plans to evaluate the post-remediation groundwater monitoring data.
- In light of the foregoing, EPA must eliminate the proposed point of compliance monitoring requirement (except for the area of the removal action completed in 2010), grant a waiver to the federal drinking water ARAR, and establish alternative concentration limits for the Site, unless EPA re-establishes the Rhode Island Department of Environmental Management ("RIDEM") groundwater protection standards as Site ARARs.

Conclusion

In summary, in the FS Report, the Addendum, and the PRAP, EPA disregards key legal requirements in CERCLA, and, contrary to the NCP, ignores crucial technical facts and evaluation processes, thus rendering the resulting remedial alternatives analysis and selected remedies in the PRAP unreliable and unsupportable. CERCLA § 113(j)(2) provides that EPA's remedy selection decisions will not be sustained if they are "arbitrary and capricious or otherwise not in accordance with law." 42 USC § 9613(j)(2). A decision is "arbitrary and capricious"

where EPA has relied on factors which Congress has not intended it to consider, entirely failed to consider an important aspect of the matter, offered an explanation for its decision that is contrary to the evidence before the agency, or makes a decision that is so implausible that it would not be ascribed to a difference in view or the product of the agency's expertise. *See U.S. v. Burlington N.R.R. Co.*, 200 F.3d 679, 689 (10th Cir. 1999) (finding EPA's failure to make a second amendment to the Record of Decision for OU1 was arbitrary and capricious because it was inconsistent with the NCP); *see also State of Minnesota v. Kalman W. Abrams Metals, Inc.*, 155 F.3d 1019, 1024-25 (8th Cir. 1998) (finding response action to be arbitrary and capricious under CERCLA § 113(j)(2) because it was inconsistent with the NCP). As discussed in detail in these comments, EPA's remedy decisions fail to meet this statutory standard in numerous respects, including, but not limited to the following:

- EPA disregards key legal requirements in CERCLA and ignores crucial technical facts and required evaluation steps contrary to its own regulations;
- Contrary to its own regulations, rules, policy, and guidance documents, EPA concludes that all impacted environmental media at the Site contain a RCRA F-listed waste, and that certain soils and sediments contain PTW;
- EPA makes improper assumptions regarding community opposition to the most cost-effective remedial alternatives for the Ponds and the River sediment, while ignoring community opposition to the alternative that EPA champions;
- EPA misconstrues RCRA and TSCA, and misapplies the ARARs, leading to improper and unsupported conclusions regarding the scope of necessary excavation and capping of environmental media;
- EPA improperly applies EO 11988 when evaluating the implementability of the

nearshore CDF, and ignores the hydrodynamic modeling demonstrating that the nearshore CDF would result in no appreciable flood inundation effects;

- EPA fails to adequately assess the many uncertainties regarding the cost and implementability of an upland CDF;
- EPA changes the groundwater classification without supporting information in the administrative record or considering the effect on the remedial alternatives to meet the newly introduced RAOs, or the newly expanded area proposed for remediation (revised from 0.13 to 8.0 acres). Nor does EPA explain how it plans to use the post-remediation groundwater monitoring data to assess the adequacy of the proposed remedy;
- EPA fails to accurately assess the remedial alternatives for both the Oxbow Area portion of the Lyman Mill Stream Sediment and Floodplain Soil, and the Lyman Mill Reach Sediment due to the absence of necessary data to compare the alternatives' effectiveness; and
- EPA fails to consider key components of its conceptual site model for the Oxbow Area as it relates to potential post-remediation releases of contaminants of potential concern ("COPCs") from the Oxbow Area into Lyman Mill Pond.

In light of the foregoing discussed arbitrary and capricious decisions of EPA, and the multiple failures of EPA to comply with the requirements of CERCLA and its implementing regulations and guidance documents, EPA selects proposed remedies for the designated action areas at the Site that are infeasible to implement, unnecessary, and unreasonably costly, including remedies that would require excavation and off-Site disposal of large quantities of soil and sediment, and the installation of RCRA-compliant caps. Emhart's comments on the PRAP

demonstrate that there are far more cost-effective, equally protective, and readily achievable remedial alternatives that would fulfill the mandates of CERCLA and the NCP. By ignoring important evidence and rigidly adhering to its sorely out-of-date conceptual site model, EPA has premised its evaluation of remedial alternatives in the FS Report, Addendum, and PRAP on faulty and erroneous assumptions about the sources, types, and attributes of Site contaminants. Moreover, in failing to consider important facts and scientific data included in the administrative record, EPA fails to give the requisite consideration to or select effective, implementable, cost-effective and equally protective remedial alternatives.

The foregoing-described conduct engaged in by EPA is arbitrary and capricious, as it is contrary to CERCLA, the NCP, and EPA's own policies and guidance. Accordingly, EPA must consider these comments and the accompanying appendices, and rectify its fundamentally flawed analyses and decisions by: (1) updating its conceptual site model to accurately reflect the full administrative record; (2) properly applying Site ARARS, including abandoning its incorrect application of the F020 waste code, PTW designations for in-place, contaminated environmental media, and classification of Site groundwater; and (3) re-evaluating and modifying the remedial alternatives proposed for application at the Site.

GLOSSARY

2,3,7,8-TCDD: 2,3,7,8-tetrachlorodibenzo-p-dioxin
2,3,7,8-TCDF: 2,3,7,8-tetrachlorodibenzofuran
2,4,5-T: 2,4,5-Trichlorophenol
2,4,5-TCP: 2,4,5-Tricholorophenolate
ACOE: United States Army Corps. of Engineers
Addendum: Addendum to the FS Report
Atlantic Chemical: Atlantic Chemical Company
ARAR: Applicable or Relevant and Appropriate Requirement
CDF: Confined Disposal Facility
CERCLA: Comprehensive Environmental Response, Compensation and Liability Act
cfs: Cubic Feet per Second
COPC: Contaminant of Potential Concern
cy: Cubic Yard
Diamond Alkali: Diamond Alkali Company
Emhart: Emhart Industries, Inc.
EO: Executive Order
EPA or Agency: United States Environmental Protection Agency
FS: Feasibility Study
FS Report: Interim Final Feasibility Study Report
HCP: Hexachlorophene
HCX: Hexachloroxanthene
Integral: Integral Consulting, Inc.
IQA: Information Quality Act
LDR: Land Disposal Restriction
LEA: Loureiro Engineering Associates, Inc.
MCL: Maximum Contaminant Level
MCLG: MCL Goal
MCPP: Methylchlorophenoxy-propionic Acid
Metro-Atlantic: Metro-Atlantic, Inc.
Na-2,4,5-TCP: Sodium 2,4,5-Tricholorophenolate
NaOH: Sodium Hydroxide
NCP: National Contingency Plan
NECC: New England Container Company
NRRB: National Remedy Review Board
OSWER: United States Environmental Protection Agency, Office of Solid Waste and Emergency Response
Otis: Otis Air Base
Oxbow Area: Lyman Mill Reach Stream Sediment and Floodplain Soil
PCDD: Polychlorinated Dibenzodioxin
PCDF: Polychlorinated Dibenzofuran
PCB: Polychlorinated Biphenyl
PCE: Perchloroethylene
Peninsula: Two Parcels Located at 2072 and 2074 Smith Street
Ponds: Allendale and Lyman Mill Ponds
ppb: Part per Billion
ppm: Parts per Million
ppt: Parts per Trillion
PRP: Potentially Responsible Party
PRG: Preliminary Remediation Goal
PRAP: Proposed Remedial Action Plan
PTW: Principal Threat Waste
Quonset: Quonset Naval Base
RAO: Remedial Action Objective
RIDEM: Rhode Island Department of Environmental Management
ROD: Record of Decision
River: Woonasquatucket River
RCRA: Resource Conservation and Recovery Act
RI Report: Interim Final Remedial Investigation Report
Site: Centredale Manor Restoration Project Superfund Site
SVOC: Semi-volatile Organic Compound
TBC: To-Be-Considered Material
TCRA: Time Critical Removal Action
TEQ: Toxic Equivalent
TSCA: Toxic Substances Control Act
VOC: Volatile Organic Compound

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Comments of Emhart Industries, Inc. on U.S. EPA's Proposed Remedial Action Plan (October 2011), Addendum to the Interim Final Feasibility Study Report (September 2011), and Interim Final Feasibility Study Report (April 30, 2010)

I. Introduction

Emhart Industries, Inc. ("Emhart") respectfully submits these comments on the Interim Final Feasibility Study Report ("FS Report"), Addendum to the Interim Final Feasibility Study ("Addendum"), and Proposed Remedial Action Plan ("PRAP") released by the Environmental Protection Agency ("EPA") for the Centredale Manor Restoration Project Superfund Site in North Providence, Rhode Island ("Site"), and requests that they be included in the administrative record for the Site. We have included herein an overview of the Site background, including the Site history and a description of historic Site operations and a discussion of the proposed remedial alternatives by EPA for each of the designated "action areas" at the Site. For ease of review, we also have included an Executive Summary of our comments at the outset of this document. Moreover, Appendix A contains an evidentiary summary documenting the flaws in EPA's conceptual site model and RCRA waste code determination identified in the PRAP. Further, we have provided in Appendix B, a summary of the laws, regulations, and guidance applicable to EPA's remedy selection process at the Site. Both of the appendices are incorporated in these comments by reference.

Emhart has identified herein numerous shortcomings in EPA's remedy selection process as embodied in the PRAP. In the likely event of judicial review, the validity of EPA's remedy selection process will be determined based on the administrative record. The comments provided herein include abundant factual and legal support that would compel a judicial finding that EPA's remedy selection process is "arbitrary and capricious or otherwise not in accordance

with law," the standard of review under § 113(j)(2) of the Comprehensive Environmental Response, Compensation and Liability Act ("CERCLA" or "Superfund").

The Site consists of two parcels located at 2072 and 2074 Smith Street (the "Peninsula") in North Providence, Rhode Island, adjacent to the Woonasquatucket River ("River"), and downstream areas that allegedly have been impacted by activities on the two parcels. Substances designated as "hazardous" under CERCLA, including volatile organic compounds ("VOCs"), semivolatile organic compounds ("SVOCs"), dioxins, furans, polychlorinated biphenyls ("PCBs"), metals, herbicides, and pesticides, have been detected at the Site, including on the two parcels, along the riverbank, and in sediments in two downstream ponds – Allendale Pond and Lyman Mill Pond.

In the PRAP, EPA identifies proposed remedial alternatives for each of five "action areas" deemed by EPA to require some level of cleanup. The five action areas at the Site are denominated as: (1) Allendale and Lyman Mill Reach Sediment, consisting of Allendale Pond, the River channel north of Allendale Pond, and Lyman Mill Pond; (2) Allendale Reach Floodplain Soil, consisting of the floodplain areas abutting the river channel north of Allendale Pond and abutting Allendale Pond itself; (3) Lyman Mill Reach Stream Sediment and Floodplain Soil (the "Oxbow Area"), consisting of the stream channel and old mill raceway connecting Allendale and Lyman Mill Ponds, as well as the forested wetland southwest of Allendale Dam and floodplain areas abutting Lyman Mill Pond; (4) Source Area Soil; and (5) Source Area Groundwater.[4]

[4] Please note that throughout this document, defined terms are designated by capitalization. For example, Source Area Groundwater and Source Area Soil are EPA defined terms and are capitalized when referring to the particular action area. However, when a term such as "source area soil" is not capitalized, it refers to the soil that is present in the Source Area Soil action area or also may be present in the Source Area Groundwater action area.

Emhart has identified herein significant flaws in EPA's remedy selection process, which have resulted in a PRAP that favors remedial alternatives that are neither implementable nor cost-effective, and, further, are arbitrary and capricious, and contrary to CERCLA and the National Contingency Plan ("NCP"), its implementing regulations. For example, with respect to the Allendale and Lyman Mill Reach Sediment action area, the PRAP reflects EPA's preference for excavation of potentially enormous quantities of sediment and disposal at an off-Site location, contrary to both legal requirements under CERCLA and significant considerations regarding technical impracticability and implementability. The preferred remedies for both the Allendale Reach Floodplain Soil action area, and the Lyman Mill Reach Stream Sediment and Floodplain Soil action area, pose many of the same concerns.

With respect to the Source Area Soil action area, EPA expresses a clear preference in the FS Report for a capping remedy that meets or exceeds the requirements for closure of a hazardous waste landfill under Subtitle C of the Resource Conservation and Recovery Act ("RCRA"). However, the impacted soils at issue are not considered to be a waste at all under EPA's own regulations and guidance documents, and therefore are not subject to the unduly stringent (and costly) RCRA Subtitle C closure requirements that EPA would seek to impose.

Finally, with respect to the Source Area Groundwater action area, EPA neglects to reconsider the effect on the remedial alternatives to meet either the newly-introduced Remedial Action Objectives ("RAOs") or the newly-expanded area proposed for remediation (revised from 0.13 acres to 8.0 acres). Nor does EPA explain how it plans to evaluate post-remediation groundwater monitoring data in assessing the effectiveness of the remedy selected in the PRAP, particularly given that the removal action completed in 2010 was designed and implemented

solely to address groundwater in the limited area beneath the approximately 0.13 acres on the west side of the Brook Village parking lot.

II. Background

A. Site History

In or around 1952, the New England Container Company ("NECC") began a steel drum reconditioning operation at the Site whose primary facilities were on the eastern side of the Peninsula adjacent to the "tailrace." However, NECC's receiving, storage and waste disposal activities eventually encompassed much of the Peninsula. As documented in Appendix A, this operation included the processing through an incinerator of residue-laden 55-gallon open-head steel drums, which thereafter were reconditioned and painted for reuse. For a period of time, NECC also reconditioned residue-laden 55-gallon closed-head drums by means of a caustic washing process. These processes and other activities conducted by NECC in connection therewith resulted in the release of a large volume of numerous CERCLA hazardous substances at the Site, including dioxins, PCBs, pesticides, and herbicides. NECC operated at the Site until 1972.

Atlantic Chemical Company began operations at the Site in 1944, as a manufacturer of textile chemicals and, for a period of time, products used in the paper industry. In 1953, Atlantic Chemical changed its name to Metro-Atlantic, Inc. ("Metro-Atlantic") and continued to operate on the Site until 1968. As further documented in Appendix A, for a period of months in the mid-1960s, Metro-Atlantic manufactured Hexachlorophene ("HCP") in a building separate from its main operations. EPA wrongly alleges that Metro-Atlantic's HCP operation resulted in the release of dioxins at the Site. Emhart is the alleged successor to Metro-Atlantic.

Currently, there are two high-rise apartment buildings, known as Brook Village and Centredale Manor, on the parcels. Adjacent to the eastern side of the Peninsula is a drainage

swale or "tail race" that ultimately empties into Allendale Pond. The River flows along the western side of the Peninsula.

B. Emhart's History of Cooperation

EPA released an Interim Final Remedial Investigation Report ("RI Report") for the Site in June 2005. The FS Report was released in April 2010. The Addendum was released in September 2011. During the implementation of the RI and FS, Emhart cooperated with EPA to carry out extensive additional sampling and analysis necessary to complete the Site characterization process and assessment of remedial alternatives, document the efficacy of response activities to date, and confirm that contaminants are not migrating in source area groundwater, as discussed below.

As early as 2000, Emhart began working with EPA to identify a range of remedial alternatives for the Site in an effort to establish a sensible cleanup approach that is both cost-effective and fully protective of human health and the environment. Since that time, Emhart has expended in excess of $10 million in investigating and mitigating potential hazards at the Site. Initial measures, some of which were undertaken in conjunction with one or more other Potentially Responsible Parties ("PRPs"), included installation of a temporary soil cap and implementation of flood control measures on the Peninsula, restoration of Allendale Dam, sampling and excavation of residential soils and shoreline sediments, and capping of soils and sediments adjacent to the eastern side of the Peninsula.

In 2007 and 2008, Emhart performed a hydrodynamic analysis of the River and Allendale Pond, and a Comparative Ecological Risk Assessment, to further EPA's evaluation of remedial alternatives. This resulted in the incorporation of a number of other remedial alternatives for consideration by EPA. Thereafter, in 2009 and 2010, Emhart excavated a large volume of soils and sediments, which were disposed off-Site, and installed an impermeable cap in fulfillment of

the requirements of a Time Critical Removal Action ("TCRA") to address a portion of the Source Area Groundwater action area.

Also in 2009, Emhart commenced litigation against NECC and began pursuing discovery. The litigation resulted in a greatly expanded factual record which directly refuted the "conceptual site model" in EPA's RI Report. *Emhart Indus., Inc. v. NECC*, C.A. 06-0218-S (D.R.I. 2006).

Most recently, Emhart performed a supplemental investigation at the location designated by EPA as the Lyman Mill Reach Stream Sediment and Floodplain Soils action area (the "Oxbow Area"). The purpose of that investigation was to collect additional data necessary to permit EPA to properly evaluate the remedial alternatives under consideration for this area, analyze potential risks to human health and the environment posed by this area, and ultimately to select an appropriate remedial action for this area.

Notwithstanding Emhart's aforementioned record of cooperation with EPA, and its submission to EPA of extensive evidentiary material revealing gross inaccuracies in the "conceptual site model" contained in its RI Report, EPA apparently elected to disregard much of the technical input and factual record developed by Emhart, and released its flawed FS Report, Addendum, and PRAP.

III. Summary of Applicable Laws, Regulations, and Guidance

A summary of applicable laws, regulations, and guidance is included in Appendix B.

IV. Discussion of Remedial Alternatives

A. Site-Wide Considerations

EPA has divided the Site into five "action areas," and Emhart has provided specific comments with respect to the remedial alternatives under consideration for each of those action areas in Section IV.B. herein. However, there are a number of overarching issues and

misapplications of law by EPA that have implications for the remedy selection process, either Site-wide or for more than one action area. These broader considerations are discussed below.

1. EPA's Conceptual Site Model Required by the NCP is Not Supported by the Administrative Record

Given the often substantial passage of time between the performance of the Remedial Investigation and the Feasibility Study that follows, the development by EPA of a conceptual site model is not a static exercise. Rather, it is to be an iterative process that evolves over time as additional information is identified or discovered and evaluated in each of the categories that comprise the elements of the conceptual site model. *See* Section A.2 of Appendix B. Here, the FS Report, Addendum, and PRAP reflect a static, outdated, and factually erroneous conceptual site model that is not supported by the administrative record. EPA's decision is therefore arbitrary and capricious or otherwise not in accordance with law because it has "offered an explanation for its decision that runs counter to the evidence before the agency." *U.S. v. Burlington N.R.R. Co.*, 200 F.3d 679, 689 (10th Cir. 1999).

The Centredale Manor Site provides a prime example of the need for EPA to build upon and refine the initial conceptual site model over time to conform to the information in the administrative record. During the five-year period that elapsed between EPA's issuance of the RI Report and its issuance of the FS Report, a great deal of additional information and data were added to the administrative record, and previously collected information was further evaluated in light of newly discovered evidence. For reasons that are not clear, EPA declines to incorporate the significant amount of additional Site information developed over time, leaving its conceptual site model essentially unchanged from that developed over five years ago. Thus, proper site characterization, upon which the conceptual site model and, ultimately, the RI/FS must be based, is significantly impaired.

In the RI Report, EPA sets forth a conceptual site model in which it identified Metro-Atlantic's HCP process as the principal source of the dioxin and Hexachloroxanthene ("HCX") contamination identified in Site samples. Emhart has submitted extensive documentation to EPA for inclusion in the administrative record demonstrating that NECC's drum reconditioning operation, rather than Metro-Atlantic's HCP manufacturing process, was the likely source of the dioxin and HCX found at the Site. An objective evaluation of previously available information, coupled with the supplemental factual record developed during the past five years (as described in detail in Appendix A to these comments), leads inexorably to the conclusion that NECC and its customers were the principal, if not the sole, source of the dioxin and HCX at the Site. EPA's refusal to update and revise its conceptual site model with respect to "the known and suspected sources of contamination," or "the type of contamination" at the Site, is indisputably at odds with its own guidance. *See* U.S. EPA, *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA*, OSWER Dir. 9355.3-01 (Oct. 1988) ("*RI/FS Guidelines*"), at 2-7.

For example, EPA's conceptual site model fails to consider the collocation of chemicals in soil present at depth in the "footprint" of the former HCP manufacturing building. A review of the data from soil samples collected from CMS-451 and MW-05S shows the presence of elevated concentrations of the herbicide methylchlorophenoxy-propionic acid ("MCPP"). MCPP was detected in samples collected in the "footprint" of the former HCP manufacturing building (CMS-451) at concentrations ranging between 20 mg/kg and 68 mg/kg at depths of 5 to 10 feet below ground surface. MCPP is not known to have been utilized or otherwise associated with Metro-Atlantic's operations. Thus, its presence at these very elevated concentrations at depth in the "footprint" of the former HCP building indicates that the disposal of chemicals used by

others occurred in this area. Nevertheless, EPA does not present any analysis or conclusions regarding these data and/or their impact on the conceptual site model.

Moreover, EPA's conceptual site model fails to consider the congener profile of the dioxins found in the Site samples, and no effort whatsoever has been made by EPA to identify the source(s) of the dioxins by performing a chemical analysis of the 2,3,7,8-tetrachlorodibenzo-p-dioxin ("2,3,7,8-TCDD"). As demonstrated in Appendix A, if EPA had conducted such a chemical evaluation, it would have discovered that the 2,3,7,8-TCDD identified in the Site samples did not come from the sodium 2,4,5-tricholorophenolate ("Na-2,4,5-TCP") that Metro-Atlantic received exclusively from Diamond Alkali and used in its HCP manufacturing process, and therefore must have come from a source other than Metro-Atlantic.

Further, EPA's conceptual site model is inconsistent with sworn testimony and physical evidence provided by Emhart to EPA for inclusion in the administrative record. For example, the FS Report states that chemicals were *possibly* discharged directly to the River from the HCP building. *See* FS Report, at 2-12 (emphasis added). EPA cites the testimony of Kenneth Michael Neri in support of this aspect of the conceptual site model. However, the only mention by Mr. Neri of a discharge to the River is from a pipe he recalls being located "anywhere from a hundred feet to 100 yards" downstream of the Smith Street bridge. However, in a later examination of Mr. Neri, he placed the alleged pipe "closer to Smith Street." *See* Trial Transcript of K. Neri, *Emhart Indus., Inc. v. Home Ins., Co.*, C.A. 02-053-S (D.R.I.) (Oct. 6, 2006), at 9:17-10:4, 39:25-40:6. In fact, the northernmost corner of the HCP building was approximately 480 feet south of the Smith Street Bridge; thus, the pipe noted by Mr. Neri was not even in the immediate vicinity of the HCP plant. Further, Mr. Neri testified that he had no knowledge of what may have been discharging from the pipe. *See id.* at 11:6-8, 23:13-15.

Rather, both deposition testimony and physical evidence demonstrate that the HCP building was connected to the sanitary sewer and not a source of discharges to the River. *See* Trial Transcript of J. Buonanno, *Emhart Indus., Inc. v. NECC*, C.A. 06-218-S (D.R.I.) (Jan. 14, 2009), at 38:19-39:2; *see also* Supplemental Expert Report of Dr. James R. Kittrell (Nov. 7, 2011), at 25; Supplemental Expert Report of Dr. James R. Kittrell (May 5, 2010), at 2. Photographic evidence collected in 2009 and provided to EPA in connection with the TCRA excavation show the HCP building footprint to be devoid of any subsurface structures, such as a dry well or leaching trenches, which could have served as a means of on-Site waste disposal during or in connection with the HCP manufacturing process. *See* Addendum to Expert Report of John R. Kastrinos (Mar. 31, 2010), at 6. In fact, the referenced photographic evidence of the excavation shows utilities, including a sewer, serving the area of the HCP building, thus supporting other testimony and evidence that the plant was connected to the municipal sewer system. *See* Section B.2.b of Appendix A.

In its conceptual site model, EPA also ignores established expert opinion that no liquids containing dioxin would have been discharged in the HCP production process, and that even if such liquids were discharged, the volume of dioxin contained therein would have been so infinitesimal that the liquids could not possibly have accounted for the volume of dioxin present on the Site. *See* discussion at *id.*; *see also* Supplemental Report of Dr. Francesco Stellacci (Dec. 24, 2009), at 3. EPA further ignores expert opinion that the activated carbon filtration used by Metro-Atlantic would have removed from HCP process wastes any dioxin or HCX present, *see* Rebuttal Report of Dr. Francesco Stellacci (Oct. 27, 2011), at 3; Supplemental Report of Dr. Francesco Stellacci (Jan. 12, 2009), at 4-5, and also ignores testimony that HCP process filters were disposed of off-Site. *See* Trial Transcript of J. Buonanno, *Emhart Indus., Inc. v. Home Ins.*,

Co., C.A. 02-053-S (D.R.I.) (Sep. 14, 2006), at 87:3-11; Trial Transcript of J. Nadeau, *Emhart Indus., Inc. v. Home Ins., Co.*, C.A. 02-053-S (D.R.I.) (Sep. 15, 2006), at 27:23-28:8, 48:5-49:10; Trial Transcript of J. Turcone, *Emhart Indus., Inc. v. Home Ins., Co.*, C.A. 02-053-S (D.R.I.) (Sep. 18, 2006), at 5-7; *see also* discussion, *infra*, at Section B.2.c of Appendix A. Finally, EPA also disregards expert opinion establishing that no activated carbon was associated with the 2,3,7,8-TCDD found on the Site, further supporting the conclusion that HCP process filters containing 2,3,7,8-TCDD were not disposed of on Site. *See* Supplemental Report of Dr. Francesco Stellacci (Jan. 12, 2009), at 8-9; *see also* discussion, *infra*, at Section B.2.c of Appendix A.

None of the testimony EPA cites permits the conclusion that Metro-Atlantic discharged chemicals from the HCP building directly into the River or onto the ground. The record is clear that, to the extent that there was any liquid waste whatsoever from Metro-Atlantic's HCP operation, it would only have been discharged into the sewer, not into the River nor onto the ground at the Site.

Another deficiency in EPA's conceptual site model is that it fails to explain the presence of high concentrations of HCX in the tail race, just adjacent to and downstream of NECC's drum washing and refurbishing operations. EPA steadfastly contends that any HCX would have been associated with Metro-Atlantic's HCP process. However, samples from the tail race, including SD-30, CMS-SS-4104, CMS-SS-4111, CMS-SS-4111, CMS-SS-4109, and CMS-SS-4106, reveal HCX concentrations ranging from 11,382 pg/g to 93,773 pg/g. In contrast, soil sample CM-SO-MW05-0406 collected from the footprint of the former HCP building was found to contain only 2,350 pg/g HCX, consistent with HCX concentrations in numerous upstream background samples (SD-33, SD-34, SD-35, and SD-37). Similarly, sediment samples collected

downstream of the former HCP plant, at WRC-SD-2010 through WRC-SD-2013, did not contain HCX concentrations above those reported for upstream samples. These observations belie EPA's contention, as expressed in its conceptual site model, that the HCX at the Site was indisputably a "marker" directly associated with the HCP manufacturing process.

The validity of EPA's conceptual site model is further placed into question by data from surface and subsurface soil samples collected from the riverbank on the western shore of the River. These sampling locations, CMS-022, CMS-023, and CMS-024 are not, according to field sampling notes, in depositional areas. Rather, they are in an erosional area. *See* Trip Report: Soil Sampling, 15-19 February 1999 (Mar. 1999), at Appendix C. Nevertheless, samples collected from these locations were found to contain concentrations of 2,3,7,8-TCDD as high as 73,000 ng/kg in surface and subsurface soils. These concentrations are in sharp contrast to dioxin levels detected in soil samples elsewhere on the western side of the River, and cannot be explained by any facet of EPA's conceptual site model.

The presence of elevated levels of 2,3,7,8-TCDD in these soils located on the western bank of the River, particularly the subsurface soil, does not comport with EPA's conceptual site model depicted either in the Addendum, the FS Report, or the RI Report. In fact, neither the Addendum, the RI Report, or the FS Report discuss these sampling locations specifically, nor do they discuss the means by which 2,3,7,8-TCDD came to be located at these locations and depths. These sampling locations and depths, the dioxin concentrations, and the described physical characteristics of the sampling locations (*i.e.*, erosional) all are inconsistent with EPA's conceptual site model for the Site. EPA's failure to address in any fashion this anomalous data is contrary to the requirements of the NCP, and clearly demonstrates the flaws in EPA's conceptual site model.

In sum, EPA premises its evaluation of remedial alternatives in the FS Report, Addendum, and PRAP on faulty assumptions about the sources, types, and attributes of contamination at the Site. In failing to consider important facts and scientific data, EPA overlooks compelling evidence demonstrating that its conceptual site model and underlying site characterization are seriously flawed. By maintaining its sorely out-of-date and erroneous conceptual site model in the face of substantial conflicting evidence, EPA engages in arbitrary and capricious conduct because it fails to properly comply with a major aspect of the RI/FS "scoping" requirements under the NCP. *See* 40 C.F.R. § 300.430(b)(2). Furthermore, as discussed below, EPA's faulty conceptual site model results in the Agency's erroneous application of the F020 waste code at the Site. Since EPA offers an explanation for its decision that runs counter to the evidence before it, its decision is arbitrary and capricious. *See U.S. v. Burlington N.R.R. Co.*, 200 F.3d 679, 689 (10th Cir. 1999). Emhart respectfully submits that EPA, in accordance with the NCP and the *RI/FS Guidelines*, is required by law to update its conceptual site model to reflect current Site information, and to revise its evaluation of the remedial alternatives accordingly.

2. The F020 Waste Code Is Applied Improperly, Unnecessarily Limiting Remedial Options and Increasing Costs

The underlying assumption in the FS Report and PRAP that all contaminated media at the Site contain a RCRA F-listed waste, namely F020, *see* FS Report, at 7-6, is plainly erroneous. That assumption – and the assessment of remedial alternatives flowing from it – must be corrected. EPA's wrongful application of the F020 waste code to impacted soil and sediment has led the Agency to select an unnecessarily costly remedy, which is at odds with both EPA guidance and with EPA's classification of contaminated environmental media at the Site during previous removal actions.

As discussed in Section C.1.c of Appendix B, it is not permissible to assume that all impacted media at the Site contains an F-listed waste where the presence of contamination in the media cannot be traced back to a release of waste from an original process meeting the F020 description. The administrative record and EPA's conceptual site model do not support the conclusion that all dioxins found in Site samples came from Metro-Atlantic's former HCP operation. The lack of evidence linking dioxins at the Site to an F020 waste source is overwhelming. *See, e.g.*, Letter from D. Scotti, LEA, to A. Krasko, EPA Region 1, Re: Remedial Alternative for Source-Area Soil (Sep. 11, 2007). Rather, current evidence points to NECC's drum reconditioning operation as the sole or predominant source of dioxin presently found at the Site.

EPA's application of the F020 waste code to dioxin at the Site is arbitrary and capricious because the record in this proceeding is entirely devoid of any evidence whatsoever that spills, releases, dumping, or disposal of any dioxin or dioxin-containing chemicals occurred in connection with Metro-Atlantic's HCP production process. Moreover, as discussed in Appendix A, the "profile" of the dioxin found in samples in the area of Metro-Atlantic's former HCP operation, and throughout the remainder of the Site, is completely inconsistent with the byproduct contaminants that likely would have been contained in the Na-2,4,5-TCP "starter" material that Metro-Atlantic procured as a raw material from Diamond Alkali. *See* Expert Report of Dr. Gregory Fu (Jan. 7, 2011), at 5; *see also* Supplemental Expert Report of Dr. James R. Kittrell (Jan. 7, 2011), at 26 ("Dioxin congener profiles of the 'source-like' samples at the Site are not consistent with Crude TCP delivered to the Site from Diamond Alkali in 1964-1965.").

In making its arbitrary and capricious determination that the source of the dioxin at the Site is a F020 listed waste, EPA completely disregards the most obvious and well-documented

source of Site dioxin – the drums received by NECC from customers of its drum reconditioning operation during the period 1952 through 1972. The administrative record documents indisputably that NECC received 55-gallon steel drums from at least 19 customers in the textile chemical industry, which contained approximately 650 different types of chemical residues. During the relevant time period, NECC also received 55-gallon steel drums from at least 10 customers in the chemical and petroleum industry, and from two military bases, containing approximately 370 different types of chemical residues. *See* Expert Report of Dr. James R. Kittrell (Jan. 15, 2009), at 4-45; Expert Report of Dr. Richard Aspland (Jan. 13, 2009), at 8-68.

Many of the chemicals attributable to NECC's customers have been found as contaminants at the Site. *See* Updated Expert Report of Dr. Gregory Fu (Feb. 6, 2009), at 5. According to Dr. Fu, a Firmenich Professor of organic chemistry at the Massachusetts Institute of Technology, of the various chemical residues present in 55-gallon steel drums that NECC is known to have received for reconditioning, nine contained dioxins as a contaminant. *Id.* Moreover, of the various chemical residues present in 55-gallon steel drums that NECC received for reconditioning during the relevant time period, over 150 generated dioxins during NECC's incineration process through one of two chemical processes known as the "precursor" and "de novo" routes. *See id*. at 5, 20. Dioxins also were produced during NECC's incineration process when certain chemical residues were in the presence of certain other chemical residues, such as those containing chlorine, through either the "precursor" or "de novo" routes. *Id.*

EPA's Office of Solid Waste has taken the position that "[i]f the waste in question cannot be traced back to an original process that would generate a waste meeting any listing description, then it is exempt from regulation providing that it does not fail a hazardous waste characteristic test." Letter from S. Lowrance, EPA, to J. Noles, Laidlaw Environmental Services (TS), Inc.

(Dec. 24, 1992) (PPC 9444.1992(09)); *see also* Memorandum from J. Skinner, Director, to D. Wagoner, Director, Air and Waste Management Division, Region VII (Jan. 6, 1984) (PPC 9441.1984(01)) Re: Soils From Missouri Dioxin Sites ("If the exact origin of the toxicants is not known, the soils cannot be considered RCRA hazardous wastes unless they exhibit one or more of the characteristics of hazardous waste …."). As noted previously, the dioxins in the soil and sediment that will need to be managed during the implementation of the Site remedy cannot be traced back to a single original process that would meet a hazardous waste code listing. Moreover, the dioxins are not characteristically hazardous waste. Thus, RCRA, and the F020 waste code, are not applicable.

Moreover, EPA's decision to apply the F020 listing to waste generated at the Site is inconsistent with EPA's decisions at other dioxin sites. For instance, at the Hatheway and Patterson Superfund Site in Mansfield, Massachusetts, EPA described the "Operational History" of the site in the Feasibility Study Report as follows:

> Wood treatment was accomplished by a variety of methods that changed over time. From 1953 through 1958, a solution of pentachlorophenol (PCP) in fuel oil, or creosote, was used for dipping lumber. After dipping, excess chemicals were allowed to drip off of the treated wood onto the ground surface. From 1958 through 1974, solutions of PCP in fuel oil and fluorochrome-arsenate-phenol (FCAP) salts in water were used in a pressure treatment process. From 1960 through 1984, PCP in mineral spirits was also used to pressure-treat lumber. From 1974 to 1984, operations incorporated PCP in fuel oil and chromated copper-arsenate (CCA) salts in water. From 1984 until operations ceased in 1993, solutions of CCA salts in water and PCP in water were utilized at the property. Wood was also infused with fire retardants including Dricon TM (boric acid and anhydrous sodium tetraborate). The various wood-treating chemicals were stored in aboveground storage tanks (ASTs), underground storage tanks (USTs), and sumps located inside and outside of the former process buildings (MADEP, 1994).

(*See* FS Report Section 1.2.3, at 1-3). This description provides a level of understanding similar to, if not greater than, that which is provided for the Centredale Manor site. Nonetheless, EPA

Region 1 rejected applying an F-listing to the contaminated media at the Hathaway and Patterson site:

> RCRA, the Resource Conservation and Recovery Act establishes a comprehensive scheme of regulation for the transportation, storage and disposal of hazardous waste. Although the Site was a wood treating facility, the contamination **was not found to constitute "listed waste" based on the limited available information about past operations at the Site**. Contaminated media at the Hatheway and Patterson Site may exhibit characteristics similar to RCRA "characteristic" waste. Therefore, certain requirements of RCRA must be met or considered during the remediation process and when determining the final condition of the Site.

Id. at Section 5.5, at S-6 to S-7 (emphasis added).

Similarly, for the Tittabawassee River and the Upper Saginaw River and Floodplain soils in Midland, Michigan, impacted by Dow Chemical Company ("Dow") operations, EPA did not require the application of a hazardous waste listing to wastes generated at the site, citing other potential but unknown sources of dioxins that have affected the watershed.

Further, in deciding on a petition submitted by Dow for the source area at the Dow plant, the Michigan Department of Environmental Quality ("MDEQ") stated that:

> [S]oils impacted by F039 hazardous waste must be managed as hazardous waste until the soils have been shown to not contain contaminants. The contaminants within these soils may include dioxins and furans, as well as metals and other organic constituents. The primary source of the dioxin and furan contaminants in Dow Midland Plant soils is thought to be from past waste disposal areas associated with 2,4,5-Trichlorophenol (2,4,5-T) and pentachlorophenol herbicide and related manufacturing/formulation plants that operated between the 1930s and the 1970s. The dioxins and furans were inadvertent byproducts or impurities formed during the manufacture of the chlorinated phenolic products. These dioxin and furan contaminated soils impacted by hazardous waste are the subject of the Petition submitted by Dow to the MDEQ. The variance does not apply to soils that are not hazardous waste. **River sediments are generally classified as solid waste rather than hazardous waste and, therefore, would not be affected by this variance**.

See MDEQ Interoffice Communication from G.A. Bruchmann, Chief, Waste and Hazardous Materials Division, to S.E. Chester, Director (May 8, 2008) (emphasis added).

EPA's application of the F020 waste code to the contaminated media at the Centredale Manor Site is particularly puzzling given that EPA refrained from applying a waste code to materials at the Diamond Alkali, Lister Avenue Superfund Site in Newark, New Jersey, the facility from which Metro-Atlantic obtained the Na-2,4,5-TCP as a raw material. Of particular note, EPA states that:

> [B]etween March 1951 and August 1969, the Diamond Alkali Company operated a facility located at 80/120 Lister Avenue (facility) and manufactured agricultural chemicals including dichlorodiphenyltrichloroethane (DDT), 2,4-dichlorophenoxyacetic acid (2,4-D), 2,4,5-trichlorophenoxyacetic acid (2,4,5-T), and 2,4,5-trichlorophenol (2,4,5-TCP). 2,3,7,8-TCDD is a by-product of the production of 2,4,5-T. Poor housekeeping practices during this time resulted in the release of DDT, 2,4-D, 2,4,5-T, 2,4,5-TCP and 2,3,7,8-TCDD to the Site soils and to the Passaic River.

See Request for Authorization to Conduct a CERCLA Non-Time Critical Removal Action at the Diamond Alkali Site, Newark, Essex County, New Jersey from E.J. Wilson, EPA Region 2 Section Chief, Removal Action Branch, to A.J. Steinberg, Region 2 Regional Administrator (Jan. 8, 2009), at 4. EPA further states that:

> Based on existing analytical data, a portion of the sediment has the potential to be classified as a characteristic hazardous waste due to the presence of hazardous constituents above the toxicity regulatory levels. The mean concentration of dioxin, based on the historical sediment sampling results from within the Phase I work area, is 244 ppb. Because this value is greater than the universal treatment standard (UTS) of 1 ppb, it was assumed that some of the sediment will require treatment (most likely incineration but the possible use of oxidizers and polymers will be considered as well) prior to disposal. Other than the sediment that contains characteristic hazardous waste or contains dioxin levels above 1 ppb, it is likely that the remainder of the sediment will not require treatment prior to land disposal. During design, the percentage of sediment requiring treatment will be refined further.

Id. at 12-13. Notably, nowhere in this document does EPA discuss a requirement to ascribe a RCRA F-listing to this contaminated media.

Unlike at the Lister Avenue Site, where there is a documented discharge to the Passaic River, the presence of contamination in the media cannot be traced back to a release of waste

from an original process meeting any listing description at the Centredale Manor Site. Soil sample results reveal significant concentrations of dioxin, furan and PCB congeners unrelated to either a Hexachlorophene ("HCP") manufacturing operation or the hazardous constituents for which a F020 waste code would apply. Moreover, the results of the radiometric age dating study suggest that there may be an alternate source for the dioxin contamination prior to 1965, when HCP manufacturing operations were conducted. This information is sufficient to satisfy EPA policy that "[i]f the waste in question cannot be traced back to an original process that would generate a waste meeting any listing description, then it is exempt from regulation providing that it does not fail a hazardous waste characteristic test." EPA's application of the F020 waste code at the Centredale Manor Site is both inconsistent with this policy and with EPA's recent decisions at other CERCLA sediment sites.

Moreover, EPA has taken internally inconsistent positions regarding the application of the F020 waste code during the course of the Site investigation. For example, EPA's contractor, Battelle, disposed of investigation-derived waste as a non-listed waste when implementing an EPA-approved sampling plan, notwithstanding that Battelle was sampling in the area of the former HCP manufacturing facility that EPA contends is the source of the dioxin. *See* Battelle, *Final Work Plan, Groundwater, Semi-permeable Membrane Device (SPMD) and Sediment Collections* (Apr. 2005), at 5, 6. Additionally, when the PRPs excavated soil from residential/recreational-use properties in the floodplain as part of a removal action, EPA approved the PRPs' request to dispose of the excavated soil without an F020 waste code. *See* Email from E. Vaudo, EPA Region 1, to J. Muys, Swidler & Berlin (Dec. 19, 2002). In contrast, EPA required that materials associated with the restoration of Allendale Dam, and materials removed from the footprint of and immediately proximate to the former HCP manufacturing

building, be characterized as F020 waste. Now, for the first time, EPA takes the position that *all* impacted media must be managed as containing an F-listed waste, without any indication in the administrative record or elsewhere that EPA is relying on new information.

EPA's arbitrary and capricious application of the F020 waste code to the environmental media at the Site limits the remedial options considered in the FS Report, and leads to EPA unnecessarily selecting a more costly proposed remedial alternative. If EPA had not applied the F020 waste code to contaminated media at the Site, the PRAP would have enabled excavated soil and sediment to be placed in a confined disposal facility ("CDF") not subject to RCRA closure requirements.

Furthermore, EPA fails to evaluate in the FS another implication of misapplying the F020 waste code to excavated soil, sediment or debris. There are just three incinerators within the United States that have the potential to accept F020 wastes: (1) Clean Harbors Deer Park Incineration Facility in Deer Park, Texas; (2) Veolia Environmental Services Facility in Port Arthur, Texas; and (3) Clean Harbors Aragonite Incineration Facility in Grantsville, Utah. Currently, however, none of these facilities are permitted to accept F020 waste. Although one or more of these facilities could potentially accept F020 waste with a permit modification, such modifications typically take several years to obtain.

As important, the facilities in Texas have capacity to accept 70 tons per day, and the Utah facility has capacity to accept 50 tons per day. These daily capacities represent the total capacity to accept hazardous waste from all shippers within the United States. In the unit costs presented in Appendix J of the FS Report and Addendum, EPA identifies off-Site hazardous waste disposal costs based on a quote from Clean Harbors. It is noted that EPA assumes a production rate for loading and off-Site disposal of hazardous waste of 260 tons per day. So, for example, even

assuming, under the excavation options considered in the PRAP, Addendum, and FS Report, that the estimated 112,900 tons of material to be removed and disposed off-Site legally could be received by the Clean Harbors facility in Texas as a hazardous waste, which could not occur without a permit modification, under current capacity constraints, it would take approximately five years for Clean Harbors to process the total volume of waste needed to complete the project. This calculation is based on EPA's unrealistic assumption that the Clean Harbors facility would accept waste from the Site exclusively for that entire period. A more realistic estimate would be based on the assumption that the material could not be shipped to the Clean Harbors' facility at maximum capacity on a daily basis, in which case it would take decades to complete the project.

While there are incinerators in Canada, there are few facilities in Canada that can accept the waste today, resulting in a less than competitive market. Thus, the disposal costs that would be incurred in shipping the waste to Canada – setting aside the cost and environmental impact of transport – are very high and are set by a few facilities. These increased costs are not factored into EPA's evaluation presented in the PRAP, Addendum, and FS Report. Clearly, EPA does not evaluate this alternative at the level of detail mandated by the NCP.

The application of the F020 waste code, and the determination that excavated material is a hazardous waste, also would subject this otherwise non-RCRA regulated material to the State of Rhode Island Hazardous Waste Generation Fee. This fee is $46 per ton of hazardous waste manifested in Rhode Island. EPA fails, though, to include this state levy in the estimated costs presented in the PRAP, Addendum, and FS Report. Thus, EPA must add approximately $5.2 million to its cost estimate for implementing the selected remedy because the excavated material carries the F020 waste code.

To comply with the NCP and its implementing guidance, EPA must re-evaluate its application of the F020 waste code and associated RCRA requirements to contaminated media at the Site, and revise its evaluation of the remedial alternatives considered in the PRAP, Addendum, and FS Report accordingly.

3. EPA Does Not Fulfill the Requirements of the IQA and Implementing Guidelines Because EPA Fails to Incorporate Current Site Data

As discussed in Appendix B, information and data disseminated by EPA must meet OMB and EPA standards for "objectivity," "utility," and "integrity." In order to meet the "objectivity" standard, the information and data must be "presented in an accurate, clear, complete, and unbiased manner" and be "accurate, reliable, and unbiased." The FS Report does not satisfy these requirements.

First, the information on which EPA bases its conceptual site model is not "accurate, reliable and unbiased." The conceptual site model does not reflect newly developed evidence regarding NECC's drum reconditioning operation and its identification as the likely source of the dioxin and HCX on the Site.

Second, the FS Report contains no discussion whatsoever of the March 30, 2010 flood event which occurred prior to EPA's release of the Report, and resulted in record high flows (>1750 cubic feet per second ("cfs")). It is noteworthy, but never mentioned by EPA in the FS Report, that these historically high flows resulted in no damage to the existing soil caps in the Source Area Soil action area. *See* EPA Memorandum Regarding Post-Flood Inspection of April 15, 2010 (Apr. 27, 2010). It must be assumed that disclosure of this finding in the Addendum and the FS Report would have engendered further support for retaining Alternative 2 (Monitor and Maintain Existing Surfaces) as the favored remedy for the Source Area Soil.

Emhart respectfully submits that EPA must update the FS Report to fully address the more recent Site data in its evaluation of remedial alternatives for Source Area Groundwater and Soil.

4. EPA Improperly References in the Addendum and the FS Report the Draft Recommended Interim PRGs, Which Are Inapplicable to the Evaluation of Remedial Alternatives

EPA improperly references in the Addendum and the FS Report the Draft Recommended Interim Preliminary Remediation Goals ("PRGs") for dioxin in soil. The Draft Recommended Interim PRGs have no bearing on the development of Site cleanup goals. They are not ARARs, nor are they "to-be-considered" materials ("TBCs"). In fact, EPA's *Public Review Draft of the Draft Recommended Interim Preliminary Remediation Goals for Dioxin in Soil at CERCLA and RCRA Sites,* OSWER Dir. 9200-3.56 (Dec. 2009) ("Draft Recommended Interim PRGs"), expressly states that: "the findings and conclusions in this document are for public review and should not be construed to represent any final agency determination or policy." *Id.* at document footer. Moreover, EPA states that: "[u]ntil these draft recommended interim PRGs are finalized, EPA will continue to use the 1998 recommended interim PRGs (EPA 1998)." *Id.* at 2. Thus, the Draft Recommended Interim PRGs for dioxin in soil are not intended for use until finalized, are inapplicable to any evaluation of remedial alternatives at the Site, and improperly were discussed by EPA in the FS.

Furthermore, the evaluation in Appendix N of the FS Report, which presents a cursory discussion of the potential effect of a revised PRG for dioxin on the implementability and cost of various remedial alternatives, is arbitrary and capricious because EPA lacks a basis to delineate or include additional areas within the spatial extent of the cleanup area represented by locations with dioxin toxic equivalent ("TEQ") concentrations below the current PRG for dioxin in soil (1 ug/kg). Similarly, if EPA is considering establishing any further RAOs in light of changes to

toxicological criteria for dioxin, it must re-examine the potential human health risk associated with potential exposure to dioxin within each exposure area. For example, for a residential property, the exposure area would include the full extent of the residential property, including the area outside of the floodplain which is part of the residential backyards. Unless EPA first determines the potential human health risks associated with exposures from the entire property, it cannot conclude whether any further remediation is necessary.

EPA recognizes the shortcoming of its analysis as it relates to possible changes to the PRGs for dioxin in soil. It states that:

> [T]he proposed cleanup areas or remedial footprints as conveyed in [Appendix N], are conceptual. More precise cleanup footprints will be developed during the remedial design, and the removal of contaminated media will be confirmed through appropriate sampling and monitoring.

FS Report, at N-3. Presently, EPA is unable to specify the spatial extent of any such additional areas and the concomitant additional soil volumes to be remediated, or the cost implications of remediating any such additional areas under a revised PRG. Consequently, EPA's attempt to assess the costs and feasibility of the various disposal options in the FS Report, and particularly in Appendix N, with reference to hypothetical future cleanup goals is of no utility.

In lieu of speculating about remedial alternatives based on a host of unknown variables, EPA must apply the current dioxin PRG to the known facts of the Site in the FS Report, Addendum, and the PRAP.

5. EPA's Analysis of Remedial Alternatives Must Give Proper Weight to Remedies That Reduce Uncertainties in Cost and Implementability

As discussed in Section A.1 of Appendix B, the Site cleanup goals, to which the remedial alternatives are addressed, must reflect CERCLA §121 standards. However, EPA fails to define the Site cleanup goals coherently and consistently in the FS Report and Addendum, thus

introducing uncertainty concerning both the spatial extent of the cleanup area and the volume of contaminated environmental media requiring remediation. These flaws, in turn, undercut the validity of EPA's analysis of the cost and feasibility of its PRAP.

However, EPA could eliminate this uncertainty regarding the cost and feasibility of the disposal alternatives, and significantly reduce the volume of contaminated soils and sediment requiring removal, by selecting for the Allendale and Lyman Mill Reach Sediment action area a remedial alternative that incorporates as a primary component the *in-situ* capping of impacted sediment, such as Alternative 8a (*Partial Excavation, Isolation Capping and Disposal and/or Treatment).* The *in situ* remedial alternatives proposed for this action area are protective of human health and the environment, cost-effective, and feasible to implement. In addition, the selection of an *in situ* remedy would fulfill the National Remedy Review Board's ("NRRB") recommendations that EPA reconsider the merits of remedial alternatives that include both excavation and capping. *See* U.S. EPA, *National Remedy Review Board Recommendations for the Centredale Manor Restoration Project Site* (Oct. 28, 2010), at 4. However, EPA fails to fully and fairly evaluate such alternatives in the FS Report and Addendum, and did not select an *in situ* remedy in the PRAP.

Where EPA does calculate and apply a Site-specific cleanup goal to its analysis in the FS Report and Addendum, with respect to pond sediments and floodplain soils, its calculation of the cleanup goal is fatally flawed. Pond sediments and floodplain soils comprise, by volume, most of the environmental media slated by EPA for remediation. *See* FS Report, Table 3-8. EPA's volume estimates are based on the sediment and floodplain soil cleanup goals identified in Tables 3-3 and 3-4 of the FS Report, respectively. According to these tables, the basis for the

2,3,7,8-TCDD cleanup goals is "upstream background."[5] However, EPA acknowledges that upstream background data for sediments and floodplain soils is uncertain due to the paucity of data collected for these media.

The uncertainty in upstream background concentrations also translates to uncertainty in the removal volume estimates presented in the FS Report for Allendale and Lyman Mill Reach Sediment, Allendale Reach Floodplain Soil, and Lyman Mill Reach Stream Sediment and Floodplain Soil. This situation occurs because EPA is uncertain regarding how much sediment and soil must be removed to meet its putative cleanup goals. The absence of clarity regarding cleanup values, and the concomitant uncertainty concerning removal volumes, has significant implications for CDF design and/or off-Site disposal costs.

Furthermore, in suggesting that significant delineation of impacted soil during the remedial design would be required to determine removal volumes, EPA recognizes that it lacks knowledge of the extent of impacts to Site soils, particularly at depth. Therefore, the volume of soil required to be remediated based on the PRAP could vary substantially from EPA's volume estimate presented in the FS Report. Consequently, the soil and sediment removal volumes estimated in the FS Report likely are inaccurate (perhaps grossly so), resulting in an imprecise analysis by EPA of the remedial alternatives in the FS.

This deficiency must be corrected by according proper weight to the *in situ* remedial options, which are both fully protective of human health and the environment and are not directly dependent on the final values determined for upstream background media. The selection of an *in*

[5] Emhart does not agree with EPA that "upstream background" is the appropriate cleanup goal for pond sediments and floodplain soils at this Site. Nonetheless, Emhart believes that an accurate and fully informed calculation of upstream background levels would yield a higher number than that calculated by EPA, leading to the conclusion that a significantly higher cleanup value is consistent with the NCP.

situ remedy, such as Alternative 8 for sediments, would ensure that sediment remediation costs, volumes, and implementability do not vary significantly, even if EPA's assumptions regarding upstream background values change subsequently based on additional data that may be acquired in the future.

B. Discussion of EPA-Designated Action Areas

1. Allendale and Lyman Mill Reach Sediment

EPA considers five alternatives for Allendale and Lyman Mill Reach Sediment:

- no action.
- full excavation with the dams remaining in place (Alternative 7), with disposal either through: placement of excavated material in an "upland" confined disposal facility (CDF) (7a); placement of excavated material in a nearshore CDF (7b); on-Site incineration (7d); or off-Site disposal (7e).
- full excavation with the dams replaced with new weir structures, with disposal through placement of excavated material in a nearshore CDF (Alternative 10b).
- partial excavation and isolation capping alternative with the dams remaining in place (Alternative 8), with disposal either through: placement of excavated material in an "upland" CDF (8a); placement of excavated material in a nearshore CDF (8b); on-Site incineration (8d); or off-Site disposal (8e).
- partial excavation, isolation capping, and on-Site consolidation alternative with the dams replaced with new weir structures (Alterative 11f) (EPA screens-out the "channel-only" configuration for Alternative 11).

EPA selects Alternative 7a – full excavation, with the dams remaining in place, with disposal or placement of excavated material in an upland CDF. This selected remedy is contrary

to Emhart's recommended approach for Allendale and Lyman Mill Reach Sediment, which involves the placement of excavated sediments in a nearshore CDF or within isolation caps within the footprints of the ponds. Sediment that is not excavated would be capped *in-situ.* While EPA rejects a nearshore CDF at the Site, as discussed below, the Agency fails to satisfactorily address the many uncertainties inherent in the upland CDF disposal option, including serious questions regarding its implementability, due to the Mayor of Johnston's refusal to allow the placement of the excavated contaminated media on any properties in the Town.

a. The Nearshore CDF Disposal Option is Implementable, Protective, and Cost-Effective

In contrast to the upland CDF disposal option that EPA selects in the PRAP, the nearshore CDF disposal option is technically feasible and readily implementable. It also is equally protective of human health and the environment, and is not burdened by the need to acquire multiple properties whose availability is uncertain, and which the Mayor of Johnston has prohibited to be used for placement of excavated contaminated media. The estimated remedial costs for excavation with onsite containment in a nearshore CDF are approximately $9 million less than EPA's estimated costs for an upland CDF, the real costs of which remain unknown. Nevertheless, EPA proposes the upland CDF disposal option even though this option does not meet one of the NCP's primary balancing criteria – implementability – and despite its potentially exorbitant costs, in lieu of the implementable and cost-effective nearshore CDF option.

(i) EPA Inappropriately Relies on Executive Orders to Eliminate the Nearshore CDF Disposal Options from Consideration

EPA erroneously relies on Executive Order 11988 to effectively eliminate consideration of the nearshore CDF as a viable disposal option. EPA states that since "a portion of the

nearshore CDF would require the permanent occupancy and modification of the floodplain," Executive Order 11988 requires a determination "that there was no other practicable alternative before selecting this option as the preferred remedy." *See, e.g.*, FS Report, at 6-17. In fact, the nearshore CDF disposal option would not have any adverse effect on the floodplain; therefore, neither the Executive Order nor EPA policy requires that EPA make the stated determination.

Executive Order 11988 states that "[i]f an agency has determined to, or proposes to, conduct, support, or allow an action to be located in a floodplain, the agency shall consider alternatives *to avoid adverse effects* and incompatible development in the floodplains." Executive Order 11988, § 2(a)(2) (emphasis added). EPA policy emphasizes "[i]f there is no floodplain/wetlands impact identified, the action may proceed without further consideration of the remaining procedures set forth below." U.S. EPA, *Statement of Procedures on Floodplain Management and Wetlands Protection* (Jan. 5, 1979), at § 6(a)(1).

Hydrodynamic modeling performed by Anchor QEA, LLC ("QEA"), an EPA-approved contractor, has demonstrated that the remedial alternatives that use a nearshore CDF would "result in predicted flood inundation that has no appreciable effect beyond that for existing conditions for the areas adjacent to Allendale and Lyman Mill Ponds, even for 100-year flood events." QEA, *Hydrodynamic Analysis of Remedial Alternatives* (Nov. 16, 2007), at ES-2. Moreover, the results of the hydrodynamic modeling analysis demonstrate that the nearshore CDF alternatives "would have a negligible effect on flood stage height and floodplain inundation during high-flow events (100-year flood) in the region downstream of Manton Dam," and, further, that such alternatives can be engineered to minimize erosion. *See id.* at ES-2 to ES-3. Therefore, fully consistent with the Executive Order and EPA's Statement of Procedures, given

that no impact has been identified for the floodplain, EPA should consider the nearshore CDF disposal option viable and selected it for inclusion in the PRAP.

Moreover, EPA has never interpreted Executive Order 11988 as an absolute prohibition against selecting a remedy in a floodplain. On the contrary, EPA has routinely considered and selected alternatives in a floodplain where circumstances indicate that the remedy is the least damaging and most cost-effective alternative. When such remedies are selected, as stated in Executive Order 11988, efforts must be made to "reduce the risk of flood loss, to minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by floodplains." EO 11988, at § 1.

One recent example of a floodplain remedy selection in Region 1 is the Record of Decision released on September 30, 2010 concerning the Nyanza Chemical Waste Dump Superfund Site (Operable Unit 4, Sudbury River) (Sep. 2010) ("Nyanza Chemical ROD"). In the Nyanza Chemical ROD, EPA fully acknowledges and accounts for Executive Order 11988 in considering various alternatives, yet selects a remedy involving the modification and occupancy of a floodplain. This selection does not result from a determination that all other remedies are prohibitive. Instead, EPA weighs the pros and cons of each possible alternative and concludes that the selected remedy "is the least damaging practicable alternative because this alternative impacts the smallest area among all active alternatives considered, is expected to meet cleanup goals in a short timeframe (approximately 10 years) in the most contaminated part of the river, and presents fewer impediments to successful restoration of the aquatic environment." Nyanza Chemical ROD, at 4. EPA equates "practicable" within the meaning of Executive Order 11988 to cost-effective, stating that the alternatives to the selected remedy "are not cost-effective under the conditions found at this Site, and therefore not practicable." *Id.* at 74.

The consideration of cost-effectiveness was hardly an aberration, as EPA routinely takes cost into account in its analysis of Executive Order 11988 and remedy alternatives. For example, at Pownal Tannery Superfund Site, Region 1 EPA chooses to locate a solid waste facility within a 100-year flood plain of the Hoosic River in Vermont. *See* ROD for Pownal Tannery Superfund Site, Pownal, Vermont (Sep. 2002) ("Pownal Tannery ROD"). The Pownal Tannery ROD states that off-Site disposal was investigated during the FS stage, but no solid waste facility was identified that could take the volume of dioxin-contaminated waste that would be generated. EPA further states that the waste "could be exported to Canada for treatment and disposal, *but for an impracticably high cost.*" Pownal Tannery ROD, Executive Summary, at 2 (emphasis added). "It was determined that the selected remedy of on-Site disposal of the waste in a consolidated landfill located within the higher area of the flood plain (outside of the higher energy flood way) is the most practicable and cost-effective alternative." *Id.* The Pownal Tannery ROD states that because the selected alternative could be designed and implemented to be resistant to flood damage, and would minimize the effects on the existing floodplain, the selected remedy was "the best practicable alternative." *Id.*

Therefore, EPA should not rely on Executive Order 11988 to effectively eliminate the nearshore CDF as a viable disposal alternative. Instead, consistent with the Executive Order, EPA policy, and remedy decisions at other sites in Region 1, EPA must give adequate consideration to the nearshore CDF, which is the most practicable and cost-effective disposal alternative evaluated in the FS Report and the Addendum.

(ii) Contrary to the NCP, EPA Erroneously Screens Out Effective Remedial Alternatives that Include the Nearshore CDF Disposal Option

Contrary to the NCP, EPA "screens out" the "channel-only" configuration for Alternative 11 for the Allendale and Lyman Mill Reach Sediment action area. The NCP allows EPA to

remove alternatives from consideration at the screening stage if they are not effective, implementable or cost-effective. *See* 40 C.F.R. § 300.430(e)(7). However, none of these factors justifies "screening-out" the "channel-only" configuration for Alternative 11. Rather, EPA unjustifiably screens out this alternative based on its application of improper criteria and in violation of the NCP, stating that "[l]ocal residents that live along the river *might* express concerns regarding replacing the dams, especially because this would result in a reduction of open water area." FS Report, at 5-30 (emphasis added). Moreover, EPA states in the FS Report that "[t]he channel-only configuration (Figure 5-22), however, is screened out because *it is expected* that there would be considerable public opposition due to the substantive reduction in the water area." *Id.* (emphasis added).

EPA cannot use the community acceptance criteria as the sole basis to screen out a remedial alternative at the FS stage. As discussed in Section A.2 of Appendix B in evaluating a remedial alternative, the NCP requires EPA to first consider the threshold criteria and then if these are met to consider the primary balancing criteria in selecting and screening out remedial alternatives for the FS. Applying any other evaluative process contravenes statutory and regulatory requirements and internal EPA guidance. In fact, EPA acknowledges in the FS Report that it may not circumvent the NCP alternatives evaluation process. *See, e.g.*, FS Report, at 6-1 ("The assessment of the modifying criteria is generally not completed until after state and public comments on the Proposed Plan are received"). The NCP specifically states that community acceptance *cannot* be assessed until comments on the proposed plan are received. *See* 40 C.F.R. § 300.430(e)(9)(iii)(I). Further, EPA guidance provides that "information available on the community acceptance criterion may be limited before the public comment period for the Proposed Plan and the RI/FS Report" and EPA "<u>should not speculate on</u>

community acceptance of the alternatives." U.S. EPA, *A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents*, OSWER Dir. 9200.1-23P (Jul. 1999) ("*Guide to Preparing Superfund Proposed Plans*"), at 3-9. (emphasis added).

Notwithstanding the requirements of the NCP and its own guidance, however, EPA screens out the channel-only configuration for Alternative 11 based on sheer conjecture regarding "expected" public opinion. This elimination of the "channel-only" alternative has occurred far in advance of the required public comment period, after which the NCP instructs that EPA shall apply the community acceptance criteria. Nonetheless, in an about-face, EPA does not apply potential public opposition as a selection criterion to any other alternative, particularly the upland CDF disposal option, to which the Town of Johnston already has expressed opposition in two sets of written comments provided to EPA. EPA must retain the "channel-only" configuration for Alternative 11 in order that the full range of effective, implementable and cost-effective remedial alternatives are subject to public comment, as mandated by the NCP.

b. EPA Fails to Address Key Uncertainties Concerning the Implementability and Cost Effectiveness of an Upland CDF

Several of the remedial alternatives contemplate disposal of excavated environmental media in one or more upland CDF(s). With respect to this disposal option, which EPA has selected in the PRAP, the Agency states that dewatered, contaminated sediment could be contained in one or more CDF(s) constructed on properties above the 100-year flood elevation that would be acquired and deemed "on-Site" for permitting purposes. In discussing the implementability of this disposal option, one of the NCP's *primary balancing criteria*, EPA states that "a large land area would be required for the upland CDF." PRAP, at 29. Further, in

discussing disposal options for material excavated during the implementation of Alternative 5, EPA states that "there is sufficient capacity at potential upland CDF locations for this volume, but multiple CDF locations may be required, depending on the locations selected." FS Addendum, at 6-19. Moreover, the potential CDF locations identified by EPA are shown in Figure 5-6 of the FS Report. None of the potential upland CDF locations identified by EPA are within EPA's defined area of the Centredale Manor site, and all of the locations are within the Town of Johnston.

In correspondence submitted to EPA on December 29, 2011, the Mayor of the Town of Johnston made it absolutely clear that the Town would not allow the construction of an upland CDF within the Town. *See* Letter from J.M. Polisena, Mayor of the Town of Johnston, to A. Krasko, EPA Region 1 (Dec. 29, 2011). The Mayor more recently stated that "we [the Town] do not benefit at all, and we will fight any effort for the federal government to dredge and put [contaminated soil] on any property in Johnston – public or private." Beth Hurd, *Mayor Polisena nixes EPA proposal to bury toxic soil in Johnston*, JOHNSTON INSIDER, Jan. 11, 2012. In that interview, the Mayor further stated: "I gave them the benefit of the doubt. As long as I sit in this chair, its not going to happen. I pulled the plug – as the Mayor of this community, I don't think its worth it to have it in our town." *Id*.

In a prior interview made on January 6, 2012 in the Johnston Patch, Mayor Poisnena said town officials "were never potentially considering it." Joseph Hutnak, *Mayor's Denial of EPA Plan "Awesome" Says Resident*, JOHNSTON PATCH, Jan. 6, 2012. Further stating that, "Guess what? We're not getting anything out of it, this is bad for the community, so as long as I'm sitting here, this is not going to happen." *Id.* The Mayor also said he plans to work with the town council to prevent property owners from accepting the material. *Id*. "There's no upside,

and we're going to fight any effort if someone tries to sell (EPA) their land and put it on their land," Polisena explained. "We're going to dig our heels in and fight it. We're not going to lay down." *Id*.

Thus, all potential locations contemplated by EPA in selecting the upland CDF for inclusion in the PRAP have been eliminated by the Town. Without acceptance by the Town of Johnston, the upland CDF disposal option is no longer viable, and therefore EPA's preferred remedial alternative presented in the PRAP is not implementable. Implementability is defined to include both technical and administrative feasibility. 40 CFR § 300.430(e)(7)(ii); 40 CFR § 300.430(e)(9)(iii)(F). The EPA Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA states that "administrative feasibility [an aspect of implementability] refers to the ability to obtain approvals from other offices and agencies." U.S. EPA, *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA*, OSWER Dir. 9355.3-01 (Oct. 1988). Without approval from the Town of Johnston, the upland CDF alternative is not administratively feasible, and therefore not implementable. "Alternatives that are technically or administratively infeasible or that would require equipment, specialists, or facilities that are not available within a reasonable period of time may be eliminated from further consideration." 40 CFR § 300.430(e)(7)(ii).

Although EPA does not consider the public acceptance of this disposal option, based on information published by local media outlets, it is not reasonably conceivable that it would be publicly accepted. Without the Town's acceptance , the alternative should have been "screened-out" by EPA. To argue that Town acceptance is not needed to satisfy this primary balancing criterion (implementability) is unfounded. The simple fact that EPA went through the exhaustive and costly process of speaking with Town officials about the possibility of constructing upland

CDFs within the Town demonstrates that EPA understood that such acceptance and pre-approval were required to satisfy the implementability criterion under 40 CFR § 300.430(e)(7)(ii) and 40 CFR § 300.430(e)(9)(iii)(F). Without acceptance by Town officials, in Johnston or elsewhere, the upland CDF disposal option does not exist. Thus, any alternatives incorporating the upland CDF disposal option are not implementable.

In conducting the FS, EPA is obligated to ensure that each alternative it considered was implementable, and, if not, then to screen-out such alternatives. By not fully exploring the upland CDF disposal option, EPA engages in a flawed process that did not allow for the full and complete development of alternatives that are implementable.

The EPA process is invalid, and fails to conform to the requirements of the NCP. This is particularly untenable given that EPA screens out other remedial alternatives where EPA believes the alternative would not meet with "public acceptance," *See* Section IV.B.1.a.ii, *supra*.

It is worth noting that EPA had more than ample time to re-evaluate the upland CDF disposal option and other remedial alternatives under consideration. In correspondence sent by Emhart's counsel to EPA regarding *Preliminary Questions in Evaluating Upland CDF Disposal Alternative*, no fewer than 14 itemized concerns were identified regarding the implementability of an upland CDF. *See* Correspondence from J. Muys, Sullivan & Worcester LLP, to E. Vaudo, EPA Region 1 Re: Preliminary Questions in Evaluating the Upland CDF Disposal Alternative (Jan. 18, 2008). This correspondence was submitted at the request of EPA. Thus, EPA recognized early on in the evaluation process that any alternative incorporating an upland CDF disposal option may not satisfy the primary balancing criterion of implementability. Setting aside the Town of Johnston's reluctance to site a hazardous waste landfill in their community,

other uncertainties concerning the implementability and cost effectiveness of an upland CDF were presented in the January 18, 2008 correspondence and are provided below in detail.

The total volume of Site sediment requiring removal, including the over-dredge allowance, is calculated by EPA to be 155,800 cubic yards ("cy"). If the Allendale and Lyman Mill Floodplain soils are included, an additional 29,700 cy would require removal. The excavated sediment would be dewatered, reducing its estimated volume to 97,900 cy.[6] FS Report, at J-55. If the dewatered sediment and the floodplain soils are included, EPA estimates the volume of material that would be placed in the upland CDF(s) to be 127,600 cy.

As an initial matter, EPA may not even consider the selection of this disposal option until the administrative record is supplemented to address the following threshold issues: (1) the capacity of the targeted properties to contain the excavated sediment and soil; (2) the availability of the targeted properties for purchase at fair market value; (3) the ability to obtain a waiver from the LDR requirements, if necessary; (4) the qualification of the properties for "on-Site" classification; (5) the suitability of the properties to contain the proposed CDFs; and (6) the implementability of EPA's "excavate and test" approach. Each of these considerations is discussed below.

(i) Properties Targeted By EPA for Placement of Upland CDFs Are of Limited Size

The size of the properties identified by EPA as potential locations for upland CDFs is limited. Thus, the capacity of any upland CDFs to be constructed on these properties also is limited.

[6] EPA assumes a reduction in sediment volume of approximately 37% resulting from the dewatering. There is no support in the administrative record for this assumption, which Emhart believes to be over-stated.

EPA proposes an "excavate and test" iterative approach to sediment and soil removal that is intended to address the potential capacity limitations. *See, e.g.,* FS Report, at 5-18. Under EPA's proposed approach, the total volume of sediment and soil that ultimately would be excavated from the Allendale and Lyman Mill Reach areas would not be known prior to remedy implementation, but provision would be made for the placement of a thin-layer cover over impacted sediments and soils that remain in place due to limits on the capacity of the CDFs:

> Alternative 6 assumes that a thin-layer cover would be placed over residual contamination rather than conducting continuous dredging; the latter would not be practical considering the limited capacity for on-Site disposal and the high cost of off-Site disposal and/or treatment.

Id. at 5-12.

EPA also acknowledges the need to limit excavation in implementing Alternative 7 due to the likely limited capacity of the proposed upland CDF(s):

> This alternative includes a thin-layer cover as a contingency provided confirmation sampling reveals areas of deeper contamination or areas where the residual concentrations are above the cleanup goals. A thin-layer cover would be placed in order to reduce residual contaminant concentrations throughout the ponds to acceptable levels so that the RAOs could be achieved. Cost estimates assume the thin-layer cover will be required.

Id. at 5-18.

In light of the substantial uncertainties regarding EPA's implementation of the "excavate and test" approach, EPA's cost estimates for this range of alternatives must be viewed as highly suspect. *See* Letter from D. Scotti, LEA, to A. Krasko, EPA Region 1 (May 16, 2008*).* Accordingly, in order to determine whether an upland CDF may be a viable, cost-effective remedial alternative, EPA first must develop a sound excavation approach that is based on the known areal extent and depth of sediment and soil to be excavated, and which incorporates the application of a thin layer cover as contemplated in the FS Report. For example, Figure 5-6 of the FS Report shows three potential locations at Lyman Mill Reach where a CDF could be

constructed above the 100-year flood elevation. Possibly, a CDF could be constructed on the two proposed northern CDF locations, assuming that the existing soil within the footprint of the proposed CDFs was removed down to the ground surface elevation at the downhill dike and was shipped off-Site for disposal at a certified facility. However, EPA does not present any information regarding the quality of the soil at any of the proposed CDF locations. In the absence of such necessary information, EPA is unable to provide cost estimates for the disposal of any such soil, including the cost of the upland CDF disposal option.

Moreover, the FS Report indicates that, even using EPA's estimated volumes, the combined capacity of the two proposed northern CDF locations would be sufficient only to contain the excavated sediments (after mechanical dewatering), but not the floodplain soils to be excavated from Lyman Mill Reach. *See* FS Report, at 5-13. Thus, in order to realistically implement the upland CDF remedial alternative, construction of a third upland CDF with sufficient capacity for sediment and floodplain soil would be required, further south, near the head of Lyman Mill Pond, and above the 100-year flood elevation. *See* FS Report, Figure 5-6.

Also, the volume of sediment that ultimately will be removed from the ponds, the River, the floodplain, and the Oxbow area will not be known until the remedy is complete. EPA proposes to excavate, dewater and then dispose of the soil in the upland CDF, but has provided estimates of the degree of dewatering without performing any supporting studies. Thus, the volume of dewatered sediments could be significantly greater than estimated.

If the upland CDF is not sized properly, its capacity likely will be insufficient, in which case some volume of the excavated soil and sediment will require off-site treatment or disposal. As a result, EPA is unable to provide an accurate cost for the upland CDF alternative that it has selected.

(ii) Property for CDFs Has Not Been Purchased and Cost of Purchase is Not Included in EPA's Cost Estimate

The construction of upland CDF(s) at the locations identified on Figure 5-6 of the FS Report is dependent on the ability to acquire and access those properties. These properties must be acquired by purchase or condemnation to effectuate the proposed remedy, and EPA does not demonstrate that their acquisition can readily be achieved.

Recent experience with several current landowners illustrates that acquisition and/or access may not be readily achieved without significant negotiation or legal recourses. For example, Integral Consulting, Inc. ("Integral"), an environmental consulting company, on behalf of Emhart, attempted to obtain access to the properties identified by the Town of Johnston on property Map 35, Lot 8 and Map 36, Lots 187, and 186 for the purpose of collecting soil and sediment samples in the Oxbow Area of the Site. Lots 8 and 187 comprise a significant portion of the central CDF pictured in Figure 5-6 of the FS Report. Although Integral attempted to gain access to these properties, as well as Lots 6, 7, 8, 9, and 18 that border lots 8 and 187 to the west, access was denied by the property owner in a July 28, 2010 letter. EPA subsequently corresponded with this property owner in an August 24, 2010 letter from Anna Krasko attempting to facilitate access to these properties. Despite EPA's written access request, which suggested a "lengthy legal process under Superfund Law" might occur if access were not granted, the property owner denied access.

Similarly, Integral requested access to another parcel, also owned by the Town of Johnston, identified on Map 36, Lot 186, in connection with another planned sampling event in the Oxbow Area. This property also would have to be accessed if sediment were transported directly from Lyman Mill Pond to the southern-most proposed CDF location shown on Figure 5-6 of the FS Report. However, an August 6, 2010 letter from the Town of Johnston's Solicitor to

Integral stated, "the Town of Johnston is not prepared to provide consent for access to its property." This letter also stated that, "[t]he Town administration has repeatedly advised all parties that it is adamant in its opposition to disposal of contaminated sediment within the Town's limits."

Further, the April 8, 2009 notes prepared by EPA technical representatives from a report by its technical consultants, Battelle, regarding a meeting with a representative of Baccala Concrete Corp. state that the current owners of the southern-most CDF location shown on Figure 5-6 of the FS Report met with EPA representatives "to discuss the potential of locating a confined disposal facility (CDF) on the property." The notes are devoid of any comment, positive or otherwise, by the Baccala Concrete representative regarding the company's willingness to allow the EPA to locate a CDF on its property.

The PRPs who EPA may seek to require to perform the selected upland CDF remedy have no independent authority to compel the property owners to sell their land. *See, e.g.*, *United States v. Hardage*, 58 F.3d 569 (10th Cir. 1995). EPA has authority to seek court-ordered access to a property to effectuate a response action only if (1) EPA's right of entry has been obstructed; (2) EPA has a reasonable basis to believe that there may be a release or threat of release of a hazardous substance, pollutant, or contaminant; (3) EPA has sought consent to entry; and (4) the demand for entry is not arbitrary, capricious, an abuse of discretion, or otherwise illegal. *See, e.g., United States v. W.R. Grace & Co.*, 134 F. Supp. 2d 1182, 1185-86 (D. Mont. 2001). While EPA also may obtain property by condemnation under CERCLA § 104(j) if it is needed to conduct a remedial action, demanding possession of a parcel without adequate justification may be deemed arbitrary and capricious. *See id.* at 1189 ("If . . . the EPA sought access to an 'innocent' [*i.e.*, uncontaminated] tract of land in order to dump hazardous waste on it, its demand

for entry might be considered arbitrary and capricious. If other alternatives for disposal were plainly superior to the EPA's proposed actions, then its demand for entry might be an abuse of discretion."). Thus, a Rhode Island court may very well reject a demand by EPA for access to the properties upland of the Site based on a finding that the Agency's demand is arbitrary and capricious, and an abuse of EPA's discretion.

Finally, EPA fails to factor the cost of acquiring such properties into its cost estimate for the upland CDF disposal option, as required by the NCP and EPA guidance for purposes of conducting the detailed analysis of alternatives. *See* 40 C.F.R. § 300.430(e)(9)(iii)(G); *see also RI/FS Guidelines*, at 6-11. Also, EPA's cost analysis fails to consider that if one or more of the properties identified for the upland CDF are not available, the disposal costs would skyrocket.

(iii) Availability of an LDR Treatability Variance is Uncertain

EPA assumes, without substantiation, that it can obtain an LDR treatability variance to place dioxin-contaminated soils and sediments in upland CDFs. *See, e.g.*, FS Report, at 7-6. However, the FS Report does not contain the information required by EPA guidance to document the Agency's intent to comply with the LDRs through a treatability variance. *See* U.S. EPA, *Superfund LDR Guide #6A (2nd Edition), Obtaining a Soil and Debris Treatability Variance for Remedial Actions* (Sep. 1990), at 4. Once again, EPA's failure to follow the applicable procedural requirements in performing the FS has resulted in the Agency's selection of a remedial alternative, absent a sufficient basis to properly evaluate its effectiveness, implementability, and cost.

(iv) It is Uncertain Whether the Upland CDFs Would Be "On-Site" as Defined by CERCLA

As discussed, the FS Report identifies three potential locations for the upland CDFs, all situated within the Lyman Mill area: "The northern CDF would be built where the current

ground surface slopes up to the northwest of Lyman Mill Pond. The second CDF could be built south of the abandoned channel where the current ground surface slopes up along the western border of the Oxbow . . . . The third CDF with sufficient capacity (for sediment and floodplain soil) could be constructed further south, near the head of Lyman Mill Pond and above the 100-year flood elevation." FS Report, at 5-13 and Fig. 5-6. EPA acknowledges that use of these locations may result in some destruction of upland habitat and/or wetlands, and has stated that mitigation for wetland impacts would be required. Also, the proposed locations would require evaluation of their relative ecological functions and values during the remedial design. *See* FS Report, at 5-13.

For an upland CDF to qualify as "on-Site" for purposes of obtaining CERCLA permit waivers, it must be (1) necessary, (2) suitable, and (3) in very close proximity to the contamination area. *See U.S. v. General Electric Co.*, 460 F. Supp. 2d 395, 403 (N.D.N.Y. 2006). The proposed upland CDF locations perhaps may qualify as being in "very close proximity" to the Site. They are contiguous with Allendale Pond and Lyman Mill Reach and Pond, all of which comprise EPA-designated action areas requiring clean-up. The *GE* court found that a processing facility to be built within 1.4 miles of the Hudson River Site was in "very close proximity," even though the location itself was not contaminated with hazardous substances. *Id.* However, given the multitude of remedial options that are under consideration for the Site, if options not requiring disposal in an upland CDF(s) meet the NCP criteria, then the upland CDF may not be "necessary." Moreover, if there are significant issues concerning the impact on the wetlands and/or habitat, or concerning whether the EPA can obtain the land necessary for the upland CDF, the upland CDF may not be "suitable" for purposes of meeting the "on-Site" criteria.

(v) Suitability of the Targeted Properties for Placement of Upland CDFs Is Not Determined

Prior to issuing the PRAP, EPA fails to determine that the properties are suitable for upland CDFs. This assessment for suitability required that soil samples be collected and analyzed for geotechnical and chemical testing. The test results would indicate, for example, whether shallow bedrock is present that would preclude the proper construction of an upland CDF. Such testing also would indicate, for example, whether the soil at the property is contaminated, and the nature and extent of any such contamination.

Without this information, EPA cannot properly estimate the cost of the upland CDF disposal option because the cost to excavate and properly dispose of any contaminated soil that may be present at the properties is not known. Moreover, if the soil is contaminated, the question arises as to where the contaminated soil removed to create the CDF(s) would be disposed. As part of its alternatives analysis, EPA fails to consider whether the properties under consideration may have environmental issues that present significant hazards. Despite EPA's effort to estimate the costs associated with its selection of upland CDFs as the preferred disposal option, EPA fails to conduct any such testing and has not identified the locations of potential disposal facilities that could accommodate any contaminated soil that is found.

(vi) EPA's Confirmation Sampling Approach is Not Implementable

As already discussed, the "excavate and test" iterative approach to sediment removal proposed in the FS Report, *see, e.g.,* FS Report, at 5-36, does not allow for an accurate estimate of the volume of sediment to be excavated. Moreover, this approach, under which sediment samples would be collected following the excavation of impacted sediment, is infeasible to implement due to inherent time constraints in the approach. Assuming that the samples are obtained the day of excavation and are submitted for laboratory analysis that same day, the

earliest that the sample results would be known is approximately three weeks later. The results also would require validation and evaluation, which would take approximately an additional three weeks. It is assumed that, in the interim, other areas of sediment could be excavated. However, there would be limitations on the areas that could be excavated during this minimum six week time period, because the remedy would have to be conducted in an upstream to downstream manner. Thus, it is likely that remediation activities would be delayed due to the timing of receipt of the laboratory analytical results and their validation and/or evaluation.

This approach simply is not practicable or implementable during a construction project involving heavy machinery. Also, during this time, the excavated areas would be subject to impacts from precipitation events and the release of pond water from upstream reservoirs, making it very problematic to manage water within the remediation cells. One potentially implementable method to conduct this excavation remedy would be to forego the unnecessary "excavate and test" iterative approach and, instead, simply place a soil cover over areas excavated to a pre-determined depth, which already is contemplated by EPA. This latter method also would provide the requisite volume certainty in constructing the CDF.

(vii) Application of the Alternative Treatment Standards for Soil to Sediment is Not Practicable

EPA fails to identify how the concentrations of dioxin in excavated sediment can be identified to practicably apply the alternative treatment standard for soil to dewatered sediment in identifying off-site disposal options under the sediment alternatives. It is not possible to segregate sediment, or for that matter soil, to identify which sediments may be landfilled within an upland CDF. To segregate sediment on a concentration-basis requires that the sediment be staged at the site for several months after it is excavated to allow ample time for sample collection, analysis, data validation, and evaluation of the information. There is insufficient

space to stage excavated sediment, yet continue with the implementation of the remedy. Moreover, there simply is inadequate time to segregate sediment, or for that matter, soil on this basis. Thus, this disposal option, selected by EPA for the PRAP, must be reconsidered.

In addition, EPA's estimate that only 10% of the soil and sediment will exceed the alternative treatment standards for soil is based on limited data. The finding from the additional investigation activities recently completed within the Oxbow identified materials containing dioxin at concentrations above the standard that had heretofore not been considered for off-Site disposal. Thus, it appears possible that a much higher percentage of soil and sediment will contain dioxin at concentrations above the standard, therefore requiring off-Site disposal. Accordingly, the application of the alternative treatment standard for soil to sediment should be reconsidered.

c. Off-Site Disposal is Not Feasible

Under the off-Site disposal and/or treatment option, excavated soil, sediment, and debris would be shipped off of the Site, and disposed either by containment in a designated facility or by thermal treatment. As provided in the FS Report and Addendum, the dewatered, dredged material would be analyzed for dioxin and other contaminant concentrations to characterize the materials, and to determine which type of landfill would be required or if the materials need to be treated. Once the appropriate disposal facility was identified, the dewatered material would be loaded onto trucks and taken to a regional rail loading facility for transportation to the designated disposal facility.

Off-Site disposal is not a viable option for several reasons, including EPA's inability at this juncture to determine whether there would be any off-Site facilities capable of accepting the excavated material at the time that the remedy is implemented. Facilities that are capable of accepting the requisite waste types today may not have the capacity to accept such waste at the

time that the remedy would be implemented. Moreover, facilities that are operating today may not be in operation at the time that the remedy is implemented, or such facilities may not have the capacity to accept the waste or accept the waste on a schedule that is commensurate with the remediation schedule. The few facilities that may be able to accept the waste may be able to do so only on a schedule that is extended over many years, due to capacity constraints. Lastly, there are few facilities that can accept the waste today, resulting in a less-than competitive market. Thus, the disposal costs that would be incurred are subject to very high prices that are set by these few facilities. In a market that lacks competition, this could result in costs that are not realistically factored into the evaluation presented in the FS Report. Also, there is no known regional rail loading facility for transportation; nor has one been identified in the FS Report. Thus, the costs considered in the FS Report do not take into account alternative shipping methods.

Even if off-Site disposal were a feasible option, it is one that undermines EPA's extensive efforts to promote green remediation. One of the primary objectives of EPA's *Green Remediation Guidelines and Superfund Green Remediation Strategy* (Sep. 2010) is the minimization of air emissions. The transport of large volumes of contaminated soil and sediment would be directly contrary to EPA's directive that "[s]ite management plans should specify procedures for minimizing worker and community exposure to emissions, and for minimizing fuel consumption or otherwise securing alternatives to petroleum-based fuel." U.S. EPA, *Green Remediation: Incorporating Sustainable Environmental Practices into Remediation of Contaminated Sites* (Apr. 2008), at 14. Thus, the off-Site disposal option must be evaluated with appropriate consideration given to EPA's Green Remediation strategy.

d. Emhart's Recommended Approach for the Allendale and Lyman Mill Reach Sediment is Protective, Implementable, and Cost-Effective

To recap, Emhart recommends an approach for the Allendale and Lyman Mill Reach Sediment action areas that involves the placement of excavated sediments in a nearshore CDF or within isolation caps within the footprints of the ponds. Sediments that are not excavated would be capped *in-situ*. As discussed, this approach is described in the FS Report, in general, as Alternatives 10b (Dam Replacement, Excavation, and Disposal in a Nearshore CDF) and 11f (Dam Replacement, Partial Excavation, Isolation Capping and Consolidation). This approach is protective of human health and the environment, and is implementable and cost effective. Given the multitude of problems faced by EPA in implementing its selected remedial alternative, the Agency must revise its analysis of the upland CDF alternative to address the concerns raised above, and give full consideration to selecting the nearshore CDF option for inclusion in the PRAP.

2. Allendale Reach Floodplain Soil

EPA considers three alternatives for Allendale Reach Floodplain Soil:

(1) full excavation (Alternative 5), with a nearshore (Alternative 5b) or upland (Alternative 5a) CDF disposal option;

(2) full excavation, and on-Site thermal treatment (Alternative 5d); or

(3) full excavation and off-Site disposal and/or treatment (Alternative 5e).

EPA selects Alternative 5a – full excavation with an upland CDF disposal option. Although EPA treats Allendale Reach Floodplain Soil as a separate action area, the selected remedy for this area is subject to the same concerns and limitations as the alternative selected by EPA for the Allendale and Lyman Mill Reach Sediment, as discussed in Section IV.B.1. above. Thus, Emhart reiterates its objections to EPA's analysis of the remedial alternatives for Allendale

Reach Floodplain Soil, and submits that EPA should select Emhart's preferred alternative, namely placement of excavated sediment in a nearshore CDF or within isolation caps within the pond footprints, which is implementable, cost-effective, and protective of human health and the environment, as required by the NCP.

3. Lyman Mill Reach Stream Sediment and Floodplain Soil (Oxbow Area)

EPA considers two basic alternatives for Lyman Mill Reach Stream Sediment and Floodplain Soil:

(1) targeted excavation and enhanced natural recovery ("ENR") (Alternative 3), with containment in either a nearshore (Alternative 3b) or an upland (Alternatives 3a) CDF; on-Site incineration (Alternative 3d); or off-Site disposal (Alternative 3e); or

(2) partial excavation and ENR (Alternative 5), with containment in either a nearshore (Alternative 5b) or an upland (Alternatives 5a) CDF; on-Site incineration (Alternative 5d); or off-Site disposal (Alternative 5e).

EPA selects Alternative 3a – targeted excavation and ENR with containment in an upland CDF. The disposal option (upland CDF) identified in EPA's selected remedy suffers from the same problems as those discussed above for the Allendale and Lyman Mill Reach Stream Sediments action area. However, EPA's selected alternative is further flawed as discussed below.

a. EPA Arbitrarily Includes the Falco Street and Assapumpset Brook Floodplain Areas in the Proposed Lyman Mill Pond Floodplain Cleanup Area

In its evaluation of Lyman Mill Pond Floodplain soils, EPA overstates the area requiring remediation. EPA develops cleanup values based on uses of the floodplain. Further, the cleanup values are based on whether the receptor being protected is a residential receptor or an ecological receptor. EPA states that, subsequent to the 2002 and 2003 Non-Time Critical Removal Actions

("NTCRAs"), the floodplain soil along the shore of Lyman Mill Pond poses an exposure hazard to ecological receptors only. EPA designates ecological habitat as being either high value or not, and states that areas that do not represent high value ecological habitat were excluded from the proposed cleanup area. *See* FS Addendum, at 3-6.

EPA designates the "small area along the eastern shore south of Falco Street" as requiring remediation due to potential ecological hazards. EPA further states, parenthetically, and incorrectly, that "contaminant concentrations [in this area] are above the cleanup goals, including dioxin TEQ above EPA's recommended residential level." *Id.* at 3-6. In fact, a review of the data demonstrates that the highest dioxin TEQ concentration in samples collected from the area delineated on Figure G-4 near Falco Street is 145 ng/kg (sample RES-SS-11-433-02). This concentration is lower than EPA's recommended residential clean-up goal of 1000 ng/kg for dioxin.

As shown in Figure G-4 of the Addendum, the area along the eastern shore of Falco Street that is designated for cleanup is a residential area. That area, which is delineated by EPA in the Addendum, is part of the manicured residential backyards right down to the water's edge, outbuildings, and attached decks. An approximate representation of the cleanup area proposed by EPA in Figure G-4 of the Addendum is provided in the figure below.

The shaded area shows the approximate extent of the cleanup area.

EPA defines areas *not* representing high value ecological habitat as "areas that are developed, in close proximity to residential areas and lacking native vegetation…and where the riparian zone is only narrowly defined." This definition fits the description of the area near Falco Street shown above. Accordingly, EPA's proposed cleanup area cannot be considered high value ecological habitat because it largely comprises residential backyards. Rather, this area should be grouped with other "small isolated patches of floodplain vegetation occurring along the eastern shore" that do not require remediation. *Id.* at 3-6. Finally, this area cannot be considered as having a high potential for future erosion given its location relative to the primary flow of the River.

Soil sampling data from the Falco Street area represents residential soil. Therefore, given the current and foreseeable land use in this area, EPA should have compared the data from soil

samples collected in this area to residential soil clean up values (*e.g.*, 1,000 ng/kg for dioxin TEQ), and not ecological cleanup values. Nevertheless, EPA inappropriately compares chemical concentrations of soil samples collected from this area with ecologically-based cleanup goals. *Id.* at Table G-9. If EPA had used the appropriate residential cleanup values, they would have concluded that no remediation is necessary in this area. Contrary to EPA's parenthetical statement that the dioxin TEQ concentrations in the samples exceeded residential cleanup goals, the data demonstrates that the highest dioxin TEQ concentration in samples collected from the area delineated on Figure G-4 near Falco Street is 145 ng/kg, at sample RES-SS-11-433-02. This concentration is lower than EPA's recommended residential cleanup level for dioxin, 1,000 ng/kg.

Thus, EPA errs by including the Falco Street area in the cleanup footprint. EPA's decision is unwarranted and arbitrary and capricious because it does not comport with current and future land uses and the cleanup goals associated with those uses. Contrary to EPA's statements, this area does not require remediation as a high value ecological habitat or as residential area.

EPA also incorrectly includes in the proposed cleanup area the small peninsula north of the confluence of Assapumpset Brook and Lyman Mill Pond, based on its *Interim-Final Supplemental Baseline Ecological Risk Assessment. See* MACTEC Engineering and Consulting, Inc., *Interim-Final Supplemental Baseline Ecological Risk Assessment* (Sep. 30, 2004). EPA asserts that exceedences of ecological cleanup goals have occurred, and theorizes that the area is depositional and thus has the potential for erosion. *Id.* at 3-6. However, as detailed in Emhart's October 20, 2011 comments on EPA's *Interim-Final Supplemental Baseline Ecological Risk Assessment*, EPA improperly pools this area with other highly contaminated floodplain areas

(*e.g.*, the Oxbow Area). The consequence of failing to assess this area on its own is that EPA's risk assessment results are very highly skewed by data from other floodplain areas that are distant from the Assapumpset Brook floodplain area. EPA should have recognized that this area is distinctly different from the other areas based on: (1) its distance from those other floodplain areas (*i.e.*, it is not contiguous with any other significant floodplain areas evaluated by EPA); and (2) the chemical concentrations present in the samples collected on this peninsula. Moreover, EPA fails to account for the fact that the Assapumpset Brook area is influenced by a unique feature – the Brook. Thus, EPA's risk assessment approach is inconsistent with the Army Corps of Engineers' ("ACOE") functions and values assessment, which evaluated this peninsula independently of the Oxbow Area. *See* United States ACOE, *Oxbow Area Wetland Delineation Report and Functions and Values Assessment, Centredale Manor Restoration Project Superfund Site, North Providence, Rhode Island* (Apr. 2008).

Had EPA, in the risk assessment, evaluated the small peninsula north of the confluence of Assapumpset Brook and Lyman Mill Pond separately, it necessarily would have concluded that: (1) the potential risks to ecological receptors are *lower* in this area than the risks to the same receptors at upstream background locations (*i.e.*, the incremental risk would be negligible); and (2) that the dioxin TEQ concentrations in soil samples collected from this area are within the range of dioxin TEQ concentrations detected in upstream background samples. Given these facts, the NCP does not dictate that cleanup goals be derived for this area and, thus, remediation in this area is unnecessary.

b. EPA's Remedy Selection for the Oxbow Area is Arbitrary and Capricious

The NCP requires EPA to develop a fully informed conceptual site model consistent with the record evidence. Moreover, it outlines nine criteria that EPA must address in evaluating whether remedial alternatives meet the requirements of CERCLA § 121.

EPA's remedy evaluation for the Oxbow Area is based on an inadequately-developed conceptual site model. For example, EPA prepares its conceptual site model for this area without adequate information to make a reasonable determination of the fate and transport of chemicals into or out of the Oxbow Area. Therefore, EPA is unlikely to adequately evaluate two of the nine factors required by the NCP – (1) reduction of contaminant toxicity, mobility, or volume through treatment; and (2) short-term effectiveness.

Moreover, EPA has no depositional data within the Oxbow Area; therefore, the rate of current or future potential deposition is not known. Rather, EPA uses estimates of sediment deposition derived from sediment cores collected from within Lyman Mill Pond. Without sound basis, EPA assumes that the deposition rates within the Oxbow are 5 to 10 times lower than those predicted for Lyman Mill Pond. *See* Addendum, at M-58, n.a; *see also* FS, at 2-10. No technical basis is provided for the quantification of deposition rates within the Oxbow Area. Rather, EPA's assumed deposition rate, which forms the basis for the evaluation of the two NCP criteria identified above, was derived in an arbitrary and capricious manner.

Moreover, when contrasting the efficacy of the remedies under consideration, as required by the NCP, EPA plays "fast and loose" with the factors used to compare each remedy. For example, in the comparative evaluation of remedies to meet human health remediation goals, EPA states that: "the best estimates of the amount of time to reach the desired target hazard for the action-based alternatives is 25 years for Alternative 5 and 30 years for Alternative 3." EPA

further states that: "[t]he time to achieve the human health and ecological RAOs for the No Action alternative is unknown, but could be upwards of 200 years or more depending on the rate of natural recovery processes that are not monitored under this alternative (Appendix M)."

However, the language footnoted in the quoted text clearly shows a bias toward using values that result in much more favorable outcomes for EPA's preferred remedy. For example, EPA uses a deposition rate of 0.24 cm/yr and a half life of 12.9 yrs for 2,3,7,8-TCDD to assess the short term effectiveness of Alternatives 3 and 5. In contrast, it uses a deposition rate of 0.048 cm/y and no half life (*i.e.*, no degradation) when assessing the No Action alternative. *Id.* at 6-25. EPA provides no justification for the use of one chemical half-life for one alternative and no chemical half life for another. Also, the use of no half life for the No-Action alternative is contrary to statements made by EPA in Table M-15 and its corresponding notes, where EPA states that the "most likely outcomes for the remedial alternative," including the No Action alternative, have a 2,3,7,8-TCDD half life of 12.9 years. *Id.* at M-58. Also, though EPA states that the differing deposition rates are due to the construction of baffles with Alternatives 3 and 5, the increase of the deposition rate from such structures is completely undocumented.

EPA's use of unsubstantiated and arbitrarily selected values in its remedy assessment results from an incomplete understanding of the conceptual site model for this area. The absence of an accurate conceptual site model is readily apparent in EPA's contrasting response to the NRRB recommendation #4 and its discussion of its favored remedy in the FS and the Addendum. In the response to the NRRB's recommendation #4, EPA acknowledges that the proposed remedy may not operate in the way that EPA models it in the Addendum, and that potential recontamination of Lyman Mill Pond sediments may occur from transport of Oxbow surface soil. Specifically, in its response to the NRRB, EPA states:

> [T]he proposed remedy does not entirely eliminate the potential for recontamination into the sediment environment (particularly Lyman Mill Pond) and that some contamination left in place under the proposed thin-layer cover within the Oxbow Area could be remobilized and potentially transported through the aquatic food chain in the event of a catastrophic event.

See Letter from J.T. Owens, III, Director, Office of Site Remediation and Restoration, EPA Region 1, to A. R. Legare, Chair, NRRB (Sep. 28, 2011), at 4.

However, the FS and Addendum do not acknowledge the potential for recontamination of Lyman Mill Pond through sediment transport from the Oxbow Area into the pond. Due to its failure to discuss this transport mechanism in the FS and Addendum, EPA fails to consider the potential for recontamination in its assessment of either the short-term or long-term effectiveness of the Oxbow remedies or the Lyman Mill Reach sediment remedy.

The NCP compels that EPA prepare a viable and technically sound conceptual site model in order that the nine criteria can be evaluated consistently and fully. EPA clearly lacks a sound conceptual site model for the Oxbow Area as evidenced by the absence of foundational information needed to evaluate the remedies in the manner contemplated under the NCP. Additionally, EPA's FS conceptual site model for the Lyman Mill Reach Sediment Remedy fails to consider the recontamination problem referenced in EPA's response to the NRRB. EPA's evaluations of the NCP criteria for the Oxbow Area and the Lyman Mill Pond Sediments are incomplete, faulty, and arbitrary and capricious in the absence of an accurate conceptual site model.

4. <u>Source Area Soil</u>

EPA considers three alternatives for Source Area Soil:

(1) no action (Alternative 1);

(2) targeted excavation, upgrade and maintain existing surfaces, with off-Site disposal (Alternative 3); or

(3) targeted excavation, convert to RCRA caps and maintain, with off-Site disposal (Alternative 4E).

EPA selects Alternative 4E for inclusion in the PRAP – targeted excavation, convert to RCRA caps and maintain, with off-Site disposal. However, in the FS Report, EPA improperly "screens out" Alternative 2, which comprises long-term monitoring and maintenance of existing surfaces, including existing caps, parking lots, paved surfaces, rip rap and landscaped areas. For the reasons set forth more fully below, EPA's elimination of Alternative 2 is arbitrary and capricious, and must be reconsidered. Several removal actions already have been undertaken to remediate source area soil at the Site. In 2000, Emhart and others installed a soil cap (Cap No. 2), and flood control berm along the western extent of the Site. Moreover, in 2003, Emhart and others installed a cap (Cap No. 3) over contaminated soils and sediments within the former tailrace. Finally, during 2009 and 2010, Emhart performed the TCRA, described in Section IV.B.5.b., which involved the excavation and off-Site disposal of source area soils and sediments from both the Source Area Soil and Source Area Groundwater action areas, and the installation of an impermeable cap. All of these TCRA activities performed by Emhart were overseen by EPA, and determined by the Agency to be protective of human health and the environment.

In light of the foregoing, Emhart's recommended approach for the Source Area Soil action area to ensure the long-term protection of human health and the environment is to monitor and maintain the existing surfaces; extend the cap areas, as discussed herein, to address certain soils not currently capped; and, as necessary, conduct limited excavation of soils in areas exceeding Toxic Substance Control Act ("TSCA") requirements for PCBs. The soils requiring excavation could be consolidated and covered with a RCRA/TSCA compliant cap.

a. EPA Improperly Applies RCRA Closure Requirements

(i) In-Place Environmental Media Are Not Waste Subject to RCRA Closure Requirements

As discussed in Section IV.A.2., EPA concludes incorrectly that all contaminated media at the Site contain a RCRA F-listed waste. EPA not only makes an unsupportable assumption that the source area soils are a hazardous waste, it also incorrectly concludes that the RCRA cap remedial alternative for application in the Source Area Soil action area is the only alternative that would comply with all ARARs.

In fact, RCRA requirements only apply if the response activity "constitutes treatment, storage, or disposal" of a hazardous waste. *See* U.S. EPA, *CERCLA Compliance with Other Laws Manual, RCRA ARARs: Focus on Closure Requirements* (Oct. 1989), at 3. Even assuming, *arguendo*, that the contaminated media at the Site contain a hazardous waste, which Emhart disputes, disposal does not occur when wastes are consolidated within the same area of contamination or unit, treated *in situ*, or capped or left in place. *See id.* At the Site, the source area soils have been capped in place. Therefore, RCRA closure requirements are not applicable.

Because, as discussed in Sections C.1 of Appendix B, environmental media are not waste, RCRA does not apply to the Site environmental media unless and until they are removed from the land or the area of contamination. EPA implicitly concedes this point; most notably, it recently has concluded that the source area soil is not a waste by allowing Centredale Manor Limited Partnership LLC to manage soil excavated during a recent waterline replacement project as environmental media. EPA has allowed the placement of these soils – soils within the same source area and with the same contaminant concentrations – to be excavated and used as backfill within the areas of excavation. By this action, EPA acknowledges that the source area soils are

environmental media and are not subject to RCRA closure requirements. This interpretation by EPA, alone, should allow the source area soil to remain in place.

Moreover, in its comments, the NRRB notes that EPA views the dioxin-contaminated flood plain soils and millpond sediments as listed waste under RCRA. According to the NRRB, the classification of these contaminated media as listed waste affects (*i.e.*, likely limits) the range of available remedy options and potential RAOs. To help ensure consistency throughout the regions and the Superfund program, the NRRB recommends that the Region better explain in its decision documents and supporting administrative record the determination that the dioxin-contaminated flood plain soils and pond sediments are RCRA-listed waste, and the rationale for addressing those soils and sediments differently. The Region's response to this comment falls well short in this regard.

In its September 28, 2011 responses to the NRRB, the Region fails to sufficiently explain their determination. Region 1 states that it:

> [B]elieves that dioxin from the manufacturing process contaminated Site soil and sediment of the Woonasquatucket River. Waste generated from the manufacturing use of trichlorophenol is classified as F020 waste under 40 CFR §261.31. Sediment contaminated by a listed hazardous waste is subject to regulation as a listed hazardous waste. There are no exceptions that would apply to this waste.

Id. at 3.

This response is insufficient in several respects. First, there are a number of assumptions and leaps of faith to be made to get from the manufacturing use of impure trichlorophenol obtained from Diamond Alkali and high dioxin concentrations within a limited footprint of the Source Area, to EPA's conclusion that all Source Area soil, floodplain soil and pond sediment at the reaches of Allendale and Lyman Mill are F-listed hazardous waste. Merely stating that these media are hazardous waste does not make them hazardous waste.

Sometimes listed and characteristic wastes are spilled onto soil. The mixture and derived-from rules do not apply to such contaminated soil and materials because these materials are not actually wastes. Soil is considered environmental media (*e.g.*, soil, ground water, sediment). Environmental media are contaminated with hazardous waste in a number of ways. To address such contaminated media, EPA created the contained-in policy to determine when contaminated media must be managed as RCRA hazardous wastes.

Environmental media are not, in and of themselves, waste, but are regulated as hazardous waste when they contain (*i.e.*, are contaminated by) a RCRA listed hazardous waste or exhibit a hazardous characteristic. In these cases, the media must be managed as if they were hazardous waste.

(ii) There is an Insufficient Basis to Conclude that Principal Threat Waste is Present at the Site and Thus that RCRA Closure is Required

Identifying PTW combines concepts of both hazard and risk. In general, PTW are those source materials considered to be highly toxic or highly mobile, which generally cannot be contained in a reliable manner and/or would present a significant risk to human health or the environment should exposure occur. "Principal threats" include "liquids, soils and sediments contaminated with high concentrations of toxic compounds, and highly mobile materials." *Id.* § 300.430(a)(iii)(A). Low-level threat wastes are those source materials that generally can be reliably contained and that would present only a low risk in the event of a release. *See* U.S. EPA, *A Guide to Principal Threat and Low-Level Threat Wastes*, OSWER Dir. 9380.3-06FS (Nov. 1991), at 2. Low-level threats include source materials that exhibit low toxicity, low mobility in the environment, or are near health-based levels. *See id.* Wastes generally considered to be low-level threat wastes include non-mobile contaminated source material of low to moderate toxicity, surface soil containing contaminants that are relatively immobile in air or

groundwater, low leachability contaminants such as low molecular weight compounds, or low toxicity source material. *See id.*

The NCP provides that EPA is expected to employ treatment technologies to address the principal threats at a site, when practicable, and engineering controls to address waste that poses a relatively low long-term threat or if treatment is impracticable. *See* 40 C.F.R. § 300.430(a)(iii)(A)-(B). The essential point is that these "expectations" reflect the fact that source materials can be safely contained, and that treatment for all waste will not be appropriate or necessary to ensure protection of human health and the environment.

EPA identifies a limited area within the Source Area Soil action area under and south of the southern-most parking lot for the Centredale Manor Apartments as an area containing magnetic anomalies. *See* FS Report, at 2-2 to 2-3 and Figure 2-1. Although EPA defines this area in the RI Report simply as one within which soils contain magnetic anomalies, in the FS Report EPA classifies the soils in this area as constituting PTW under the NCP. *See* RI Report, at 1-5; FS Report, at 2-21.

In the Addendum, EPA changes its definition of PTW at the Site to include all Source Area soil, floodplain soil and pond sediment at the reaches of Allendale and Lyman Mill. However, EPA provides no basis for characterizing these environmental media as PTW. This classification is significant because it leads EPA to further conclude – erroneously – that RCRA closure requirements apply.

The source area soils reported to contain magnetic anomalies do not meet the definition of PTW. Geophysical surveys performed at the Site that resulted in the identification of these anomalies are simply a preliminary investigation tool to locate possible below ground surface anomalies, including buried drums. However, they do not provide the basis or support for EPA's

assertion that PTW is present in the source area soil, absent follow-up investigation that leads to the identification of drum-related hazardous substances that qualify as PTW.

In fact, more often than not, magnetic anomalies are not buried, intact drums containing hazardous material; rather, they are other relatively benign metallic debris. For example, although during the removal action a few crushed drum lids were found in the soils within the Source Area Groundwater action area, there were no findings indicating the presence of buried, intact drums of hazardous material that might constitute PTW. Thus, absent additional evidence, one would not expect to find drum-related hazardous substances in soils near the southern area of Cap Area #1.

Notwithstanding the foregoing, EPA states that "PTW include source materials at the Source Area including buried waste material that ***may be*** present particularly near the southern area of Cap Area #1 (possible buried metallic materials are shown in Figure 2-1 in the Feasibility Study). Buried waste material under Cap Area #1 ***could be*** highly toxic and highly mobile ***and could present*** a significant risk to human health or the environment should exposure occur." Letter from J.T. Owens, III, Director, Office of Site Remediation and Restoration, EPA Region 1, to A.R. Legare, Chair, NRRB (Sep. 28, 2011), at 6 (emphasis added). However, this assertion by EPA is solely speculation. In fact, the Agency fails to provide any justification for defining soils with magnetic anomalies as PTW, as there is no evidence in the administrative record supporting EPA's conclusion that soils defined by the boundaries shown in Figures 2-1, 5-28, and 5-29 of the FS Report are PTW.

The remedy in the PRAP uses treatment to address the alleged threats posed by the Source Area, to the maximum extent practicable. The proposed remedy includes excavation of this allegedly buried waste material under Cap Area #1 and off-Site disposal by incineration,

thereby reducing toxicity, mobility and volume through treatment. The estimated cost of this component of the selected remedy is $10-$15 million – to address something that EPA admits may not be present, highly toxic, or highly mobile, and may not present a significant risk to human health or the environment.

Moreover, EPA is unable to satisfy the statutory CERCLA § 121 requirement that the selected remedy permanently and significantly reduce the volume, toxicity, or mobility of the hazardous substances, pollutants, or contaminants because the data do not exist to provide a pre-remedy baseline against which EPA could compare post-remedy conditions. Finding no magnetic anomaly after implementing the proposed remedy would not satisfy the CERCLA requirement because a magnetic anomaly is not a measure of toxicity, volume, or mobility, no less the presence of a hazardous substance, pollutant or contaminant.

Further, EPA clearly states that the PTW determination "should be based on inherent toxicity and consideration of the physical state of the material." U.S. EPA, *A Guide to Principal Threat and Low-Level Threat Wastes*, OSWER Dir. 9380.3-06FS (Nov. 1991), at 2. Moreover, for presumptive remedies under CERCLA, EPA states that "the determination of whether the waste is principal threat waste cannot be made since the physical/chemical characteristics of the wastes are unknown." EPA Presumptive Remedy for CERCLA Municipal Landfill Sites, available at http://www.epa.gov/superfund/policy/remedy/presump/clms.htm (emphasis added). For the area of the magnetic anomalies, EPA's PTW determination is arbitrary and capricious as it is unsupported by the data. In this case, EPA cannot determine that PTW populates this area of the Site because the physical/chemical characteristics of the wastes in this area are unknown. EPA has not taken the necessary steps to confirm the physical presence of any drums or the chemical characteristics of any wastes that may be contained within any such drums at the Site.

Furthermore, the administrative record contains no support, and EPA provides no explanation, for characterizing as PTW all Source Area soil, floodplain soil and pond sediment at the reaches of Allendale and Lyman Mill. In contrast, EPA's remedy selections for other dioxin sites have allowed that contaminated soil and/or sediment remain in place. For instance, for the Pownal Tannery Superfund Site in Pownal, Vermont, the selected remedy, Alternative 4, involved "the excavation and consolidation of tannery lagoon waste, construction of a low permeability cap over the consolidated wastes on-site, long-term monitoring of river sediments and ground water, and institutional controls to prevent ground water consumption and excavation of waste in the lagoon area." Pownal Tannery ROD. In this decision, EPA declared that:

> The selected remedy does not include treatment which permanently and significantly reduces the toxicity, mobility or volume of the hazardous substances as a principal element. However, permanent and significant reductions in toxicity and volume will be achieved through capping which will prevent contaminant leaching into the groundwater and surface waters and through natural attenuation processes in groundwater. Approximately 85% of the lagoon sludge that exceeds the acceptable risk range in the saturated overburden will be excavated, consolidated and capped above the water table, which will greatly reduce the migration of contaminants into the groundwater and to the Hoosic River.

Id. at 82. As presented in the Pownal Tannery ROD:

> EPA has determined that on-site disposal within the floodplain is the best practicable alternative since there are few off-site facilities that will accept dioxin-contaminated material, off-site disposal costs would be significantly higher, and there are no upland locations on-site for locating the disposal facility. The consolidated material will be capped in a manner that will prevent erosion, leaching, or other disturbance of the contaminated material in the event of flooding, up to a 100-year flood event.

Id. at Table B-3. Also, at the Cabot Carbon/Koppers Superfund site, EPA allowed that:

> The most contaminated soil [principal threat waste (PTW)] will be treated within the consolidation area. An engineered cap will be constructed over the soil-consolidation area and over the vertical barrier wall.

See ROD, Cabot Carbon/Koppers Superfund Site, Gainesville, Florida (Feb. 2011), at 118 ("Cabot Carbon/Koppers ROD"). Here, EPA acts in an inconsistent manner. Without any

further investigation or other justification, it characterizes the contaminated environmental media as PTW.

In light of the foregoing, EPA selects a remedy in the PRAP that is based on unsubstantiated conclusions regarding the presence of PTW. Therefore, it lacks a basis to apply RCRA closure requirements or to require that soil within the Source Area Soil action area must be excavated for off-Site disposal. Given that EPA has not established that PTW is present at the Site, its selection of an excavation remedy for the Source Area Soil action area is arbitrary and capricious and contravenes the NCP.

Emhart respectfully submits that EPA must reconsider its refusal to include Alternative 2 in the array of remedial alternatives for Source Area Soil, and select that option, which entails long-term monitoring and maintenance of the existing caps and paved surfaces. The application of Remedial Alternative 2 in the Source Area Soil action area would ensure that the surfaces remain intact, thereby preventing direct contact with the underlying contaminated soils.

b. <u>EPA Errs in Screening Out Remedial Alternative 2</u>

Under Alternative 2, long-term monitoring and maintenance of the existing surfaces, including the existing caps, parking lots, paved surfaces, rip rap and landscaped areas, would be performed to prevent erosion and potential exposure of contaminated source area soil. Application of this alternative also would ensure that the surfaces remain intact, thereby preventing direct contact with the underlying contaminated soils.

The existing caps are protective of human health and the environment, and RCRA caps would be no more protective than the existing caps. *See* Letter from J. Loureiro, LEA, and J. Muys, Sullivan & Worcester LLP, to A. Krasko, EPA Region 1 (Jun. 8, 2007). The long-term protectiveness of the caps was demonstrated, although not mentioned in Section 2.3.5 of the FS Report, following the highest recorded flood event on the River, which occurred on March 30,

2010 and resulted in record high flows (>1750 cfs). Even with these historically high flows, no damage resulted to the present soil caps. *See* Letter from EPA Re: Interim-Final Feasibility Study (May 7, 2010), at 2 ("The flooding caused no significant structural damage to the caps or armoring.").

According to EPA, Alternative 2 would not comply with the ARARs for GB leachability, RCRA or TSCA closure, residential direct exposure, or EPA's recommended residential level for dioxin in soil (EPA, 1998). *See* FS Report, at 5-54. EPA concludes that these requirements must be met or waived in order for Alternative 2 to meet CERCLA requirements. *See id.* However, as discussed above, RCRA closure requirements do not apply. As for residential direct exposure to contaminated soils, with just a modest extension of the protective surfaces already in place, this concern could be fully addressed. (In contrast, as discussed in this section, the relocation of residents to avoid direct exposure to contaminated soils and sediments if Alternatives 3 or 4 are chosen is highly problematic.) As set forth in Section IV.B.4.b.(i) below, EPA incorrectly applies the GB leachability criteria. And, TSCA is not a bar to leaving impacted media in place, as discussed below in Section IV.B.4.b.(ii).

EPA's failure to acknowledge that the existing surfaces satisfy performance standards and its misapplication of the Site ARARs results in EPA "screening out" the most practicable alternative for the Source Area Soil action area. *See* FS Report, at 5-54 to 5-55.

(i) EPA Incorrectly Asserts that PCBs Are Present In Soil at Concentrations Above the GB Leachability Criteria

EPA asserts in the FS Report that Alternative 2 was screened-out because the existing caps would not reduce precipitation infiltration into the groundwater, nor would this alternative actively remediate the area where contaminants in the groundwater are above the Rhode Island

GB groundwater criteria and where contaminants in the soil are above the GB leachability criteria. FS Report, at 5-54.

In evaluating soil data, EPA compares contaminant concentrations to the Method 1 Soil Objectives specified in Table 2 of the State of Rhode Island and Providence Plantations, Department of Environmental Management, Office of Waste Management, *Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases, Short Title: Remediation Regulations* (DEM-DSR-01-93) ("Remediation Regulations"). From its evaluation, EPA concludes that the concentration of PCBs in source area soil (mass) exceeds the GB leachability criterion of 10 milligrams per kilogram (mg/kg). However, this conclusion is premature; the Remediation Regulations allow for a comparison of the soil data to an alternative criterion for PCBs, not only to the Soil Objectives specified in Table 2. The Remediation Regulations provide that:

> [W]ith respect to any hazardous substance in soil, the Director may approve a leachability criterion provided it is demonstrated to the satisfaction of the Director that the application of such leachability criterion at the contaminated-site is protective of the following:
>
> a. The actual and potential uses of the groundwater at the contaminated-site by ensuring that, at a minimum, the leachability criterion will not contribute to an exceedance of the applicable groundwater objective for the hazardous substance; and
>
> b. Surface water at or in the vicinity of the contaminated-site from potential migration of groundwater.

See Remediation Regulations, at § 8.02(A)(ii)(1).

When describing Alternative 3 (Targeted Excavation, Upgrade and Maintain Existing Surfaces and Disposal and/or Treatment), EPA contemplates that if there is no potential to leach, then the soils containing PCBs that apparently exceed the GB leachability criterion can remain in place; thus, it is necessary to obtain an accurate assessment of whether migration of the PCBs is

likely. *See* FS Report, at 5-55 n.50. EPA does not complete the evaluation of whether or not PCBs have the potential to leach from the soil. While EPA performs a Method 1 analysis in accordance with the Rhode Island Department of Environmental Management ("RIDEM") regulations by comparing mass results to the tabulate criteria, this is only the beginning of the necessary evaluation. *See* Remediation Regulations, § 8.02. As noted in these regulations, as quoted above, this evaluation does not end with the Method 1 analysis. EPA fails to take this into consideration in performing its evaluation; therefore, it prematurely concludes that concentrations of PCBs in soil exceed the GB leachability criterion.

Rather, the soil should have been sampled and subjected to a leachability test, such as the Synthetic Precipitation Leaching Procedure ("SPLP"), in order to complete the evaluation of whether the PCBs have the potential to leach from the soil. The SPLP test was devised to provide a realistic evaluation of leaching potential; thus, it serves as an appropriate test upon which to determine the leachability of contaminants as identified in the RIDEM regulations discussed above. Nonetheless, EPA does not subject soils sampled in the source area to the SPLP test, thus failing to complete the necessary leachability evaluation. Therefore, EPA's conclusion regarding the potential leachability of PCBs from soil is based on an incomplete analysis and, accordingly, is arbitrary and capricious. In fact, based on the Site groundwater data, it is likely that SPLP testing of source area soil would demonstrate that PCBs do not have the potential to leach into groundwater.

Further support for the conclusion that precipitation infiltration is not contributing to leaching of PCBs in soil to groundwater is found in EPA's statement that: "the existing interim caps and parking lots in the source area currently appear to be effective in limiting the leaching of contaminants into groundwater, except in the vicinity of Well MW-05S in the Brook Village

parking lot where discharge of contaminated groundwater to the Woonasquatucket River occurs." FS Report, at 5-54. Moreover, as discussed in Section IV.B.5.b and c below, the TCRA completed in the Source Area Groundwater action area successfully addresses any potential impacts from the vicinity of the Brook Village parking lot, as acknowledged by EPA. Therefore, EPA's conclusion that concentrations of PCBs in soil exceed the GB leachability criterion is inconsistent with current data, which do not indicate that leaching is occurring. In light of the foregoing, it is imperative that EPA conduct the leachability testing under the Rhode Island Remediation Regulations prior to selecting the preferred alternative for the Source Area Soil action area

(ii) EPA Improperly Asserts that Alternative 2 Does Not Satisfy TSCA Closure Requirements

In the FS Report, EPA fails to consider that the EPA Region 1 PCB Coordinator has the discretionary authority, based upon a risk-based analysis, to allow source area soil impacted with PCBs to remain in-place under TSCA. EPA fails to perform such an analysis; therefore, it is unknown whether, under TSCA, PCB-impacted soils will require removal. Thus, Alternative 2, which would allow the impacted soils to remain in place, should be carried through a detailed evaluation. Alternative 3 includes targeted excavation to remove alleged PTW and contaminated soil that exceeds the TSCA and GB leachability criteria, as well as upgrading and maintaining the existing surfaces to prevent exposure to or migration of contaminated soil in the Source Area Soil action area. Excavated material would be shipped off-Site for disposal and/or treatment. However, as previously discussed, little or no data exist to support the assumptions regarding PTW and contaminated soil that underlie Alternative 3 or for that matter EPA's selected remedy, Alternative 4E, for source area soils at the Site. For instance, just west of the Centredale Manor apartment building, the proposed excavation and soil removal remedy is not consistent with the

data: there are no data that warrant the removal of soil from this area or the capping of the parking lot area. Further, EPA fails to justify why source area soils that have not been addressed yet need to be covered with an additional 12 inches of clean soil.

Undoubtedly, such action would be unnecessary because the TSCA requirements would be satisfied if the modified Alternative 2 approach suggested by Emhart is implemented: the consolidation of the soil that would be excavated under Alternative 3 (TSCA "hot spots") into a single RCRA/TSCA cap/cell placed over the area defined by EPA as containing magnetic anomalies.

With some simple modifications to address potential exposure to contaminated source area soils at several small landscaped areas, Alternative 2 would be equally protective of human health and the environment as Alternative 3 and Alternative 4E (Targeted Excavation, Convert to RCRA Caps and Maintain, and Disposal and/or Treatment). Thus, EPA's selection of a remedy costing nearly $20 million is arbitrary and capricious given that the same outcome could be achieved for approximately $5 million by selecting Alternative 2.

c. EPA Retains Infeasible Alternatives While Improperly Screening Out Viable Ones

EPA retains infeasible alternatives (Alternatives 3 and 4), which involve extensive excavation of soils. EPA fails to adequately consider the short-term negative impacts that would result from the implementation of Alternatives 3 and 4, and which would not result if Alternative 2 were to be implemented. Alternatives 3 and 4 would result in unnecessary and unacceptable risks to the resident population of the Brook Village and Centredale Manor apartments from the potential exposure to fugitive, airborne contaminants generated during the extensive excavation of soils.

In evaluating these alternatives, EPA fails to address the problems inherent in relocating the residents of the Brook Village and Centredale Manor apartments, which would be necessary to implement Alternatives 3 and 4. Nor does EPA's evaluation of Alternatives 3 and 4 consider the costs resulting from the relocation of the residents. This task would be formidable, if not impossible, given the demographics of the population residing at the Site. Under both Alternative 3 and Alternative 4, the existing surfaces (parking lot paving) would be removed up to the apartment buildings, exposing the impacted soils and sediments. Due to the risk to human health that would occur, access to the buildings over the exposed soils and sediments would be prohibited.

The human health risks associated with the short-term effectiveness of Alternatives 3 and 4 would make the implementability of either of these remedial alternatives highly questionable. In fact, the short-term risks to human health posed by implementation of Alternatives 3 and 4 would justify a waiver of applicable ARARs, if there were any, since "compliance with such requirement at the facility will result in greater risk to human health and the environment than alternative options." *See* 42 U.S.C. § 9621(d)(4)(B); *see also CERCLA Compliance With Other Laws Manual*, at 1-72 ("Meeting an ARAR could also pose greater risks to workers or residents . . . . If protective measures were not practicable, then use of this waiver might be appropriate.").

Despite what EPA states in the Addendum, no consideration is given to the impact of EPA's preferred alternatives on the residents or the costs of relocating residents. The treatment-based remedies of Alternatives 3 and 4 would result in greater overall risk to human health due to risks posed to the surrounding community during implementation, risks that could not otherwise be mitigated.

As EPA points out in the Addendum, there is concern that large scale excavation could not be conducted in a way that would allow residents to remain in their homes given the close proximity of the contamination to two apartment buildings, which were constructed on a portion of the Source Area. Excavation work would be performed up to the perimeter of the buildings, which would block access and have a high potential to generate dust and volatile emissions at concentrations that could increase health risks to the residents. Thus, the approximately 335 residents of the two apartment buildings – many of whom are elderly and handicapped – would require relocation during construction. Because of the age and health of the building residents, relocation could have significant unacceptable short- and long-term human health impacts coupled with significant implementability issues. *See* 55 Fed. Reg. 8666, 8703 (Mar. 8, 1990) (implementation of a treatment-based remedy would result in greater overall risk to human health and the environment due to risks posed to workers or the surrounding community during implementation).

Notwithstanding the foregoing, the Region explains that the proposed remedy for the Source Area includes a RCRA cap . . . as well as clean corridors for utilities, to prevent exposure to contaminated soil both to residents and utility workers. However, the Region fails to recognize the unavoidable fact that the proposed remedy is no less disruptive and risky to on-site residents than the NRRB's suggestion that all of the site be excavated. *See* Letter from J.T. Owens, III, Director, Office of Site Remediation and Restoration, EPA Region 1, to A.R. Legare, Chair, NRRB (Sep. 28, 2011). Clearly, the selected remedy cannot be conducted, as proposed, while the public is residing on the property. Implementation of the remedial alternative, therefore, is unnecessary because monitoring and maintaining the existing caps is equally

protective of human health and the environment and can be undertaken with minimal disturbance to the residents.

Moreover, the FS includes no diagram, such as by means of a cross section, of a RCRA cap relative to the existing buildings, sidewalks and other paved areas. Installation of a RCRA cap likely would result in the final ground surface being raised one to two feet above some of these features, which would be particularly unwieldy.

With regard to the primary contaminants of concern ("COCs") at the Site, dioxins and PCBs, it is noteworthy that these contaminants are not mobile and therefore are not expected to leach to groundwater. A review of the published literature on the fate and transport of these COCs in the environment confirms the view that these contaminants do not leach. Moreover, a review of the Site groundwater data demonstrates that these COCs are not present in groundwater. Nonetheless, EPA relies on its unsupported theory, the potential leaching of these COCs to groundwater, as the basis for its proposed remedial alternatives for source area soil. EPA steadfastly refuses to move from this position despite its failure to fully evaluate site data or subject soil samples to a leachability test such as the SPLP.

Furthermore, unlike Alternative 2, EPA's selected alternative is at odds with EPA's green remediation guidance, insofar as it requires transportation by truck of large volumes of waste material. *See* U.S. EPA, *Green Remediation Guidelines and Superfund Green Remediation Strategy* (Sep. 2010); U.S. EPA, *Green Remediation Incorporating Sustainable Environmental Practices into Remediation of Contaminated Sites* (Apr. 2008).

As recommended by Emhart, Alternative 2 must be fully evaluated with the suggested modifications. As modified, the entire cost of implementing Alternative 2 would be

approximately $5 million dollars, thus eliminating the additional estimated $15 million cost of shipping and disposing of impacted soils off-Site under EPA's proposed remedy.

5. <u>Source Area Groundwater</u>

EPA considers three alternatives for the Source Area Groundwater action area:

- excavation and dewatering (Alternative 2);
- *in-situ* treatment using chemical oxidation (Alternative 5); or
- no action (Alternative 1).

In the FS Report, EPA evaluates no fewer than five remedial alternatives each of which is solely aimed at remediating the shallow groundwater area that EPA already agrees is adequately addressed by Emhart's performance of the removal action completed in 2010. The remedial alternatives initially were evaluated based on Rhode Island's classification of the Site groundwater under state law as not a potential source of drinking water. However, in response to the comments of the NRRB, in the FS Report, EPA instead classifies the groundwater within the Source Area Groundwater action area under federal law. Moreover, rather than similarly classifying the groundwater under federal law as not a potential source of drinking water, EPA instead reclassifies it as a potential source of drinking water. As a result, federal drinking water standards become the ARARs at the source area. Thus, in the Addendum, EPA revises the RAOs for groundwater to prevent exposure to contamination in groundwater in excess of federal Maximum Contaminant Levels ("MCLs") and/or non-zero MCL goals ("MCLGs") for drinking water.

Further, based on the extent of groundwater contamination above these new cleanup goals, EPA expands the area proposed for remediation from 0.13 acres (the area covered by the removal action) to 8.0 acres (the groundwater beneath the entire Peninsula), establishing a "point of compliance" boundary at the downgradient edge of the Peninsula. Notwithstanding these

fundamental changes, EPA neglects to revise its evaluation of remedial alternatives in the Addendum to address the change in groundwater classification, the expansion of the area proposed for remediation (groundwater beneath the entire Peninsula), or the newly established RAOs.

In light of the foregoing, as discussed more fully below, EPA's evaluation of the remedial alternatives and proposed remedy for this action area are flawed. EPA's failure to re-evaluate the remedial alternatives, or reconsider the selected remedy for groundwater is arbitrary and capricious, or otherwise not in compliance with law.

a. Description of the Removal Action

In August 2009, Emhart voluntarily entered into an Administrative Settlement Agreement and Order on Consent ("AOC") with EPA (CERCLA Docket No. 01-2009-0086) to perform the removal action, wherein Emhart agreed to excavate and dispose off-Site delineated dioxin-contaminated soils within the Source Area Groundwater and Source Area Soil action areas, and to install an impermeable cap, at a cost of approximately $3 million. EPA issued a Notice of Completion for this action on July 27, 2010.

The removal action was approved by EPA in an Action Memorandum dated July 16, 2009, which described the remedial nature of the action as follows:

> Impacts to the Woonasquatucket River and groundwater can be effectively reduced by excavation and disposal of contaminated soils in the area near the eastern bank of the river at the southern end of the Brook Village parking lot. The subsequent installation of an impermeable cap will prevent percolation of precipitation through underlying soils and further mitigate the migration of any residual contamination. The cap also provides a physical barrier that minimizes the possibility of direct exposure to residual levels of dioxin in soils.

The language of the AOC reflected EPA's expectation that no further action would be necessary in this area following completion of the removal action: "EPA believes that, subject to post-implementation monitoring, the removal action will mitigate a potential risk to public

health, welfare or the environment posed by this area of the Site." AOC, at 9, *see also* EPA's September 7, 2010 Press Release entitled "Short-Term Clean-up Completed at Centredale Manor Restoration Project in N. Providence." As acknowledged by EPA, this removal action remediated successfully the shallow groundwater to meet all RAOs.

b. <u>Dioxin Was Not Migrating in Groundwater</u>

Notwithstanding the foregoing, the FS Report and Addendum appear to reflect a wholly unsubstantiated theory by EPA that groundwater flow toward and into the River has served as a contaminant transport mechanism, both pre- and post-removal action. This theory, referred to by EPA as "facilitated transport," is not supported by the Site data. As explained in submissions dated June 8, August 15, and October 15, 2007, and incorporated in the administrative record, Emhart has shown that sampling results from the area surrounding the former HCP building do not support the assumption of facilitated transport of dioxin in groundwater. *See* LEA, *Shallow Groundwater Data Report* (Sep. 12, 2008), at 8-1 to 8-3. EPA nonetheless asserts in the FS Report that "[t]he elevated concentrations of 2,3,7,8-TCDD in adjacent river sediment may reflect legacy contamination from historic site activities, *continuing contributions from contaminated groundwater*, or a combination of the two." FS Report, at 2-19 (emphasis added). This is sharply at odds with post-removal action groundwater monitoring data. *See* LEA, *Addendum No. 1-Completion of Work Report, Time Critical Removal Action* (Apr. 2010), at A.5-5.

c. <u>Even If Dioxins Were Previously Migrating in Groundwater, the Removal Action is Fully Protective</u>

Assuming, *arguendo*, that dioxin previously was migrating in source area groundwater, the removal action more than adequately mitigated the risks associated with this potential migration pathway such that further action is unnecessary. This is confirmed by the results of

groundwater samples collected on February 2, 2010, from the two monitoring wells installed as part of the removal action to verify the efficacy of the action. *See id.* Groundwater sampling results for 2,3,7,8-TCDD from these two monitoring wells were 1.7 pg/L and 6.7 pg/L; both of which are lower than EPA's proposed groundwater cleanup goal of 30 pg/L developed in the Addendum. *See* Addendum, Table 3-7. Thus, the removal action effectively mitigated any risk that may have been posed by groundwater transport of dioxin to surface water, if it had been occurring.

d. EPA Inappropriately Identifies Federal Drinking Water Standards as ARARs

In response to the comments provided by NRRB, in the FS Report, EPA applies the federal drinking water standards as the ARAR at the source area and changes the groundwater classification from Class III (Not a Potential Source of Drinking Water and/or of Limited Beneficial Use) to Class IIB (Potential Source of Drinking Water) for the groundwater within the Source Area Groundwater action area. As a result, the federal drinking water standards are ARARs at the source area. *See* Letter from J.T. Owens, III, Director, Office of Site Remediation and Restoration, EPA Region 1, to A.R. Legare, Chair, NRRB (Sep. 28, 2011), at 6. It is noteworthy that in its response to the NRRB, EPA describes a Site that is clearly not suitable for drinking water purposes, now or in the future. As provided by EPA:

(1) RIDEM has identified 18 state regulated waste sites along the River in the vicinity of the Site;

(2) EPA data from wells in the Town of Johnston, and RIDEM data from the other waste sites "show non-site related groundwater contamination beyond the Source Area;"

(3) "Since 1992, the groundwater *entirely* surrounding the Centredale Manor Site has been classified as a non-drinking water (GB) aquifer by the State of Rhode Island due to

the numerous non-Superfund sources located on both sides of the Woonasquatucket River (both downstream and upstream from the Source Area);" and

(4) Based upon a review of extensive historic groundwater data provided by RIDEM, locations away from the Source Area are influenced by releases (including TCE and PCE) *not attributable to the Site.* As a result, anthropogenic conditions beyond the Source Area represent background concentrations for the aquifer beyond the Source Area.

Id. at 2.

Clearly, groundwater under and in the vicinity of the Site is not, nor will it ever be, a useable source of potable water. Nonetheless, EPA applies the federal drinking water standards as ARARs, which is inconsistent with the Agency's decision making at other Superfund sites. For instance, in the Record of Decision for the Pine Street Canal Superfund site in Burlington, Vermont, EPA determined that:

> [F]ederal drinking water standards promulgated under the Safe Drinking Water Act are not relevant and appropriate, because it is highly unlikely that groundwater at the site will be used as a drinking water source. Primary Groundwater Standards, contained in the State of Vermont Groundwater Protection Act and Groundwater Quality Standards (10 V.S.A. Chapter 47 and 48) are applicable. The Vermont Agency of Natural Resources has classified groundwater under the Site as Class IV, suitable for some agricultural, industrial and commercial use but not as a source of potable water. The management objective for Class IV groundwater is to achieve the Vermont Groundwater Standards to the extent feasible.

See ROD for Pine Street Canal, Burlington Superfund Site, Vermont (Sep. 1998), at 50 ("Pine Street Canal ROD").

Similarly, for the Pownal Tannery Superfund Site, EPA identified the Vermont Groundwater Rule and Protection Strategy (10 VSA Ch. Sec. 1390-1394) as the applicable ARAR. "The selected alternative includes long-term ground water monitoring, which will satisfy the requirements of this standard." Pownal Tannery ROD. It is noteworthy that absent

from the federal regulatory requirements identified in Table B-3: *ARAR and TBC Summary for Alternative 4, Consolidation and Capping* are the Federal Safe Drinking Water Act standards. *Id*. Moreover, at the time the Records of Decision were issued for both the Pownal Tannery site and the Pine Street Canal site, the State of Vermont did not have an EPA-approved Comprehensive State Groundwater Protection Program.

Similarly, for the Record of Decision for the Atlas Tack Corp. Superfund site in Fairhaven, Massachusetts, EPA determined that:

> The Site's aquifer has been classified by the State (314 CMR 6.03). The groundwater is classified as either Class I (fresh potable water supply) or II (saline, water near tidally influenced areas) depending on the location under the Site. The future use of groundwater was evaluated based upon EPA Region 1's "Groundwater Use and Value Determination Guidance" (EPA, 1996). This guidance "is intended to result in more informed and focused decision-making and more commonsense and cost-effective groundwater cleanups." This guidance stresses the need for site-specific groundwater "Use and Value Determination" (performed by the State, with public input, and reviewed by EPA) before applying potential chemical-specific ARARs such as MCLs. The Groundwater Use and Value Determination for Atlas Tack Corporation Superfund Site was released by DEP on March 11, 1998 (Weston, 1998b).
>
> Additionally, DEP's determination concluded that, due to the low use and value of the aquifer, use of the aquifer for potable purposes was not likely. As such, the Safe Drinking Water Act's maximum contaminant levels (MCLs) and maximum contaminant level goals (MCLGs) are not applicable or relevant and appropriate and were not used to establish groundwater cleanup levels. At the same time, because the groundwater is not suitable for potable purposes even at locations not influenced by salt water because of contamination (see Table 3 for a summary of contamination found at certain well locations), institutional controls (*e.g.*, deed restrictions, including easements) will need to be established to prevent any future use of the groundwater at the Site for drinking water.

See ROD for Atlas Tack Corp. Superfund Site, Fairhaven, Massachusetts (Mar. 2000), at 36 ("Atlas Tack ROD").

As with the three Superfund sites discussed above, the groundwater beneath and surrounding the Site is impaired and not suitable for potable purposes. Accordingly, RIDEM classifies groundwater beneath the Site as a non-drinking water GB aquifer. Moreover, RIDEM

classifies all groundwater downgradient of the Site as a GB aquifer. Thus, there is no potential point of human exposure beyond the boundary of the Site. Nonetheless, EPA inappropriately, and inconsistently given its decisions at other similarly-situated Superfund sites, applies the federal drinking water standards as ARARs at the Site.

e. Effect of EPA's Decision to Re-Classify Groundwater

Based on a review of Site groundwater monitoring data, it is known that groundwater contamination at the Source Area is spatially widespread relative to federal drinking water standards. Elevated concentrations of perchloroethylene ("PCE") above federal MCLs were detected in deeper well intervals (deep overburden and bedrock) in two areas: (i) along the western portion of the Source Area in MW14M, MW07D, and MW12D, which are located south of the area excavated during the 2009–2010 removal action; and (ii) in the eastern portion of Cap Area #1 near MW02M, MW02D, MW13S, MW13D, MW13B, MW04D, and MW04B.

The removal action completed in 2010 was designed and implemented to address only the shallow groundwater in the area beneath the approximately 0.13 acres on the west side of the Brook Village parking lot. It is not intended to, nor will it, address all groundwater beneath the entire 8.0 acre Peninsula, which contains contaminant concentrations at the point of compliance in excess of the federal drinking water standards.

Moreover, by failing to revive its evaluation of remedial alternatives for groundwater to address the revised RAOs, the administrative record is unclear how EPA plans to evaluate post-remediation groundwater monitoring data in assessing whether further action is required at the Site.

As provided in the Addendum, EPA only identifies that groundwater monitoring be conducted to assess groundwater quality relative to the new RAOs (MCLs and non-zero MCLGs) at the point of compliance. Because the removal action only addressed the shallow

groundwater condition beneath the Brook Village parking lot, the groundwater monitoring requirement at the point of compliance is a superfluous requirement, one for which there is no technical basis. It only serves as an administrative requirement to satisfy the improper change to the groundwater classification for the Site that was made in response to the NRRB comments.

Therefore, EPA must eliminate this monitoring requirement (other than for the area of the removal action completed in 2010), or identify the RIDEM groundwater protection standards as ARARs, just as EPA previously had done during the FS. Alternatively, EPA must grant an ARAR waiver for the federal drinking water standards and establish alternate concentration limits for the Site, unless the Agency works with RIDEM to approve a Comprehensive Groundwater Protection Program that would enable EPA's use of RIDEM groundwater protection standards as ARARs.

Based on the foregoing discussion, EPA's analysis of the remedial alternatives and remedy selection in the PRAP for this action area is flawed. EPA changes the groundwater classification in a manner inconsistent with its decisions at other Superfund sites where the groundwater also was determined under state law not to be a potential source of drinking water. Moreover, EPA fails to evaluate the effect of that decision on the remedial alternatives in the FS, contrary to the NCP requirements. Further, in the PRAP, EPA selects a remedy for the Source Area Groundwater action area without explaining either how the proposed remedy is expected to meet the newly assigned RAOs in the Addendum, or how EPA plans to evaluate the post-remediation groundwater monitoring data contemplated to be collected under the PRAP. Based on all of these factors, EPA acts in an arbitrary and capricious manner or otherwise not in compliance with law.

V. Conclusion

In summary, in the FS Report, the Addendum and the PRAP, EPA disregards key legal requirements in CERCLA, and contrary to the NCP, ignores crucial technical facts and evaluation processes. These actions have rendered the resulting remedial alternatives analysis and selected remedies in the PRAP unreliable and, consequently, unsupportable under the standard of review in CERCLA § 113(j)(2) for numerous reasons, including the following:

- In the FS Report, the Addendum and the PRAP, EPA disregards key legal requirements in CERCLA and ignores crucial technical facts and required evaluation steps contrary to its own regulations;
- Contrary to its own regulations, rules, policy and guidance documents, EPA concludes that all impacted environmental media at the Site contain a RCRA F-listed waste, and that all Source Area soil, floodplain soil and pond sediment at the reaches of Allendale and Lyman Mill are PTW;
- EPA makes improper assumptions regarding community opposition to the most cost-effective remedial alternatives for the Ponds and the River sediment, while ignoring the high probability of community opposition to the alternative that EPA champions;
- EPA misconstrues RCRA and TSCA and misapplies the ARARs, leading to improper and unsupported conclusions regarding the scope of necessary excavation and capping of environmental media;
- EPA improperly applies EO 11988 when evaluating the implementability of the nearshore CDF, and ignores the hydrodynamic modeling demonstrating that the nearshore CDF would result in no appreciable flood inundation effects; and

- EPA fails to adequately assess the many uncertainties regarding the implementability of an upland CDF and the cost and timelines with which it could be sited.
- EPA incorrectly identifies groundwater ARARs for the Site or otherwise neglects to reconsider the remedial alternatives for groundwater to address entirely the area proposed for remediation, revised from 0.13 to 8.0 acres, and fails to explain how it plans to use the post-remediation groundwater monitoring data to assess the need for future action at the Site;
- EPA fails to accurately assess the remedial alternatives for both the Oxbow Area portion of the Lyman Mill Stream Sediment and Floodplain Soil, and the Lyman Mill Reach Sediment due to the absence of necessary data to compare the alternatives' effectiveness; and
- EPA fails to consider key components of its conceptual site model for the Oxbow Area as it relates to potential post-remediation releases of COPCs from the Oxbow Area into Lyman Mill Pond.

In light of the foregoing listed multiple failures of EPA to comply with the requirements of CERCLA and its implementing regulations, policy and guidance documents, EPA selects proposed remedies for the designated action areas at the Site that are infeasible to implement, unnecessary, and unreasonably costly, including remedies that would require excavation and off-Site disposal of large quantities of soil and sediment, and the installation of RCRA-compliant caps. Emhart's comments on the FS Report, Addendum and PRAP demonstrate that there are far more cost-effective, equally protective, and readily achievable remedial alternatives that would fulfill the mandates of CERCLA§ 121 and the NCP. By ignoring important evidence, and

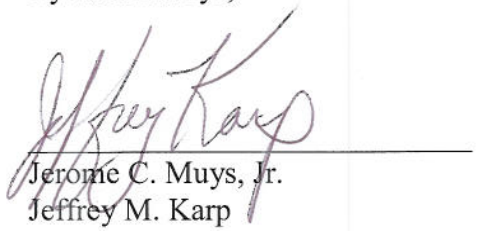
rigidly adhering to its sorely out-of-date and inapplicable conceptual site model, EPA premises its evaluation of remedial alternatives in the FS Report, Addendum, and PRAP on faulty and erroneous assumptions about the sources, types, and attributes of Site contaminants. Moreover, in failing to consider important facts and scientific data placed in the administrative record since the RI was conducted, EPA fails to give the requisite consideration to or select effective, implementable, cost-effective and equally protective alternatives.

The foregoing-described actions and decisions of EPA are arbitrary and capricious, as they are contrary to CERCLA, the NCP, and EPA's own policies and guidance. Accordingly, EPA must rectify its fundamentally flawed feasibility study process and PRAP by considering these comments and the accompanying appendices by: (1) updating its conceptual site model accordingly; (2) properly applying Site ARARs, including abandoning its incorrect F020 waste code, PTW designations for in-place contaminated environmental media, and classification of Site groundwater; and (3) re-evaluating and modifying the remedial alternatives under consideration for the Site and selected in the PRAP.

Respectfully submitted,

EMHART INDUSTRIES, INC.

By its attorneys,



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APPENDIX A: SUMMARY OF EVIDENTIARY BASIS FOR EMHART'S COMMENTS THAT EPA'S CONCEPTUAL SITE MODEL AND RCRA WASTE CODE DETERMINATION ARE SERIOUSLY FLAWED

A. Introduction

Despite the passage of 12 years since the United States Environmental Protection Agency ("EPA") issued general notice of liability letters to Emhart Industries, Inc. ("Emhart") and New England Container Company, Inc. ("NECC"), and the receipt into the administrative record of hundreds of thousands of pages of testimony, statements, reports, investigations and scientific work, in its conceptual site model for the Centerdale Manor Superfund Site ("Site")[1] EPA still clings to the unfounded speculation that 2,3,7,8-tetrachlorodibenzo-p-dioxin ("2,3,7,8-TCDD") was discharged to the Site from a hexachlorophene ("HCP") manufacturing plant that Emhart's predecessor, Metro-Atlantic Chemical Corporation ("Metro-Atlantic"), operated for less than a year in 1964 and 1965. EPA ignores the compelling facts and scientific evidence that NECC, which operated a steel drum reclamation business on the Site, was the source of the 2,3,7,8-TCDD contamination at the Site.

Because of EPA's faulty conceptual site model, the Agency erroneously applies the Resource Conservation and Recovery Act ("RCRA") F020 waste code to all the contaminated media at the Site, despite the fact that, as demonstrated below, EPA cannot trace the release of hazardous waste to Metro-Atlantic's HCP operation. Moreover, the dioxins identified in Site samples are not characteristically hazardous wastes. Thus, RCRA, and the F020 waste code, are not applicable.

[1] The Site consists of two parcels located at 2072 and 2074 Smith Street (the "Peninsula") in North Providence, Rhode Island, adjacent to the Woonasquatucket River ("River"), and downstream areas that allegedly have been impacted by activities on the two parcels; including sediments in two downstream ponds – Allendale Pond and Lyman Mill Pond, and their associated floodplain soils.

The facts in the administrative record demonstrate that:

1. The Metro-Atlantic HCP plant was connected to the municipal sewer system and any liquid waste was discharged to the municipal sewer system;
2. There were no spills or other discharges of liquid waste to the environment from or in connection with the HCP plant;
3. All solid waste from the HCP plant was placed in a dumpster and disposed of off-Site; and
4. The main Metro-Atlantic manufacturing plant, and Metro-Atlantic's reserve salt and Trifluralin operations, did not use or generate dioxin-containing substances.

The scientific and other expert reports and depositions in the administrative record confirm that:

1. Even if liquids used or generated in Metro-Atlantic's HCP manufacturing process were released to the environment, they would have contained no detectable levels of 2,3,7,8-TCDD;
2. If Metro-Atlantic had disposed of the solid, activated carbon waste involved in the HCP operation, that activated carbon would have adversely affected EPA's internal standard recovery testing results; there is no evidence that it did so, which means there is no scientific evidence that Metro-Atlantic disposed of solid waste on the Site;
3. To the extent the "starter" material, sodium 2,4,5-trichlorophenolate ("Na-2,4,5-TCP"), Metro-Atlantic purchased for use in its HCP operation contained any 2,3,7,8-TCDD, the chemical profile of that manufactured "starter" material does not match the profile of samples from the Site that contain 2,3,7,8-TCDD from a manufactured source;

4. Metro-Atlantic's HCP manufacturing process could not have generated any 2,3,7,8-TCDD; and
5. The 2,3,7,8-TCDD detected on the Site originated with discharges from NECC's drum reclamation operation.

Despite five years of litigation between Emhart and NECC, including fact and expert discovery, NECC has not:

1. Provided any rebuttal to the documentary record and the eyewitness testimony demonstrating that there were no discharges of 2,3,7,8-TCDD-containing substances from the Metro-Atlantic HCP operation;
2. Rebutted in any scientifically valid way the expert analysis and scientific evidence – including the absence of any dioxin-containing activated carbon at the Site – establishing that Metro-Atlantic's HCP operation did not discharge any 2,3,7,8-TCDD-containing substances onto the Site;
3. Supported with any scientifically valid analysis or any fact evidence its speculation that the 2,3,7,8-TCDD detected on the Site was the result of discharges in connection with the Metro-Atlantic HCP operation, such as spillage from the hose used to deliver the "starter" materials from a tanker truck directly to the reaction vessels at the Metro-Atlantic HCP plant;
4. Supported in any scientifically valid way its assertion that the polychlorinated dibenzofuran ("PCDD/F") chemical profile of the "starter" material purchased by Metro-Atlantic is consistent with contamination found at the Site; or
5. Rebutted in any scientifically valid way the scientific and expert evidence that the source of the 2,3,7,8-TCDD detected on the Site was from the NECC operation.

In 1999, EPA "speculated" with no basis in fact or science that the Metro-Atlantic HCP plant was the source of the 2,3,7,8-TCDD detected on the Site. In the 12 years since then, EPA has not confirmed its speculation with either facts or scientific analysis. Nor can it present such confirmation, as the speculation is contrary to the fact record, and the scientific and expert matter in the administrative record. Yet, EPA persists in its scientifically flawed conceptual site model, which is based solely on its original speculation, and proposes the expenditure of tens, if not hundreds, of millions of dollars for the Site remedies it advocates.

EPA's arbitrary and capricious conduct in disregarding important facts and scientific data in the administrative record has resulted in EPA overlooking compelling evidence demonstrating that its conceptual site model is seriously flawed. In turn, these deficiencies have undermined the validity of EPA's analysis of remedial alternatives in the Feasibility Study Report and the Feasibility Study Report Addendum, as well as EPA's selection of preferred alternatives in the Proposed Remedial Action Plan ("PRAP"). Consequently, Emhart respectfully submits that it is incumbent upon EPA to re-evaluate its proposed remedies based on an accurate, comprehensive analysis of all the scientific data currently available. Following is the evidentiary basis for Emhart's position that EPA's conceptual site model and RCRA waste code determination are seriously flawed.

B. Metro-Atlantic's HCP Manufacturing Operations Could Not Have Caused 2,3,7,8-TCDD Contamination at the Site

1. Description of Metro-Atlantic's HCP Manufacturing Process

For a period of less than one year during the 1964-1965 time period, Metro-Atlantic manufactured HCP, which EPA has erroneously speculated is the source of the 2,3,7,8-TCDD contamination at the Site. As discussed below, that process did not generate any 2,3,7,8-TCDD

and did not result in the release of any 2,3,7,8-TCDD to the Site.[2] Thus, EPA cannot support its application of the RCRA F020 waste code to the contaminated environmental media at the Site.

Metro-Atlantic manufactured HCP using a novel process developed and patented by Thomas Cleary ("Cleary process"). Mr. Cleary developed this process to avoid infringing upon an existing patent held by Givaudan Corporation ("Givaudan process"). *See* Dep. of T. Cleary, *Emhart Indus., Inc. v. Home Ins. Co.*, C.A. No. 02-053-S (D.R.I.) (Feb. 10, 2003), at 21; *see also Cleary Statement* (Apr. 8, 2008), at 1. The Cleary process was a so-called "batch" process, in which a producer moves materials from one vessel to another, and completes a full production cycle before beginning another "batch." *See Cleary Statement* (Apr. 8, 2008), at 1; *see also* Expert Report of Dr. Francesco Stellacci (Jan. 12, 2009), at 3.

The Cleary process involved the purification of Na-2,4,5-TCP, which was used as a starter material by Metro-Atlantic in the production of HCP. By adding and removing other liquids (which were collected and recycled for reuse in subsequent batches), and by variously heating, agitating, and cooling the resulting mixtures in different reaction vessels during the production process, Metro-Atlantic facilitated a series of chemical reactions whereby the Na-2,4,5-TCP was removed from the "starter" solution, purified (*i.e.*, converted into pure Na-2,4,5-TCP), and ultimately converted into HCP. The HCP, in turn, was extracted into two distinct "crops" of solid products, a first crop of higher purity HCP and a second crop of slightly lower purity HCP. The entire process took about 24 hours and resulted in the formation of approximately 300 pounds of dry HCP per batch of starter material. *See Cleary Statement* (Apr. 8, 2008), at 1.

[2] None of Metro-Atlantic's other manufacturing operations did or could have produced dioxin, and there is no allegation that those operations were responsible for dioxin contamination at the Site.

Diamond Alkali Company ("Diamond Alkali") supplied Metro-Atlantic with a crude (*i.e.*, unpurified) alkaline starter solution of 30% Na-2,4,5-TCP in water, with a small percentage (less than 2%) of residual methanol remaining from the production of Na-2,4,5-TCP from 1,2,4,5-tetrachlorobenzene ("TCB"). *See* Expert Report of Dr. Francesco Stellacci (Jan. 12, 2009), at 2; *see also* Supplemental Expert Report of Dr. James R. Kittrell (Nov. 7, 2011), at 39. The solution also contained a small percentage of 2,4,5-trichlorophenol ("2,4,5-TCP") as a function of the solubility of 2,4,5-TCP in the aqueous solutions. This crude "starter" solution was transferred from a tanker truck directly into the first reaction vessel at the HCP building. *See* Expert Report of Dr. Francesco Stellacci (Jan. 12, 2009), at 2, 23; *Cleary Statement* (Apr. 8, 2008), at 2.

After placement in the first reaction vessel, the crude starter solution from Diamond Alkali was treated with additional 30% aqueous sodium hydroxide ("NaOH") to convert any residual 2,4,5-TCP in the solution to Na-2,4,5-TCP. During this step, the Na-2,4,5-TCP precipitated out of the solution. The precipitate was separated from the solution by filtering it in a centrifuge. The precipitate, known as "filter cake," was recovered and washed with an additional 30% aqueous solution of NaOH. The 30% aqueous NaOH solution was collected and reused in subsequent batches. *See* Expert Report of Dr. Francesco Stellacci (Jan. 12, 2009), at 3; *Cleary Statement* (Apr. 8, 2008), at 2.

This procedure follows common and safe synthetic chemical practices and is among the most effective to achieve the starting reagent needed to produce HCP. *See* Expert Report of Dr. Francesco Stellacci (Jan. 12, 2009), at 3; U.S. Patent 3,499,045 (Mar. 3, 1970); *Cleary Statement* (Apr. 8, 2008), at 1-3. The procedure further indicates that Mr. Cleary was concerned with the yields of the reaction. Although this step is not strictly necessary, it was a reasonably-priced way

to maximize the quality of the HCP produced by decreasing the by-products overall. Expert Report of Dr. Francesco Stellacci (Jan. 12, 2009), at 3. Because the Na-2,4,5-TCP "filter cake" was the desired end product of this first stage of the Cleary process, Metro-Atlantic had a strong economic incentive to recover all of the filter cake. To that end, it extracted all of the filter cake into perchloroethylene ("PCE") and transferred (*i.e.*, slurried) this Na-2,4,5-TCP solution from the centrifuge into a second reaction vessel and this mixture was heated to 50°C. *Id.* at 3.

In the next step of the Cleary process, which took place in the second reaction vessel, the Na-2,4,5-TCP was re-protonated, that is the sodium cation was replaced with a proton (H^+) forming 2,4,5-TCP. *Id.* Sulfuric acid was added slowly to this mixture with agitation (stirring). Agitation was stopped two hours following completion of sulfuric acid addition. This process allowed the biphasic mixture to separate, and resulted in a quantitative conversion of all the Na-2,4,5-TCP to 2,4,5-TCP. The acidic aqueous phase liquid was collected and re-used in subsequent batches. *See id.* at 3; *see also Cleary Statement* (Apr. 8, 2008), at 2. The organic phase, a solution of pure 2,4,5-TCP in PCE, was transferred to a third reaction vessel. *See* Expert Report of Dr. Francesco Stellacci (Jan. 12, 2009), at 3.

In the next stage of the Cleary process, which took place in the third reaction vessel, the 2,4,5-TCP in solution with PCE was heated to 75°C. Paraformaldehyde (0.5 equivalents) was added to the reaction mixture, followed by slow addition of sulfuric acid (0.5 equivalents). This reaction resulted in the formation of an intermediate compound; however, both the paraformaldehyde and sulfuric acid are limiting reagents in the reaction, and, as a result, there was only partial conversion to the intermediate. Therefore, some 2,4,5-TCP (approximately 0.5 equivalents) remained unreacted in the reaction vessel. The products of this reaction were not isolated, but rather were taken directly into the next step of the HCP manufacturing process. *Id.*;

see also Cleary Statement (Apr. 8, 2008), at 2-3.

In the next step of the Cleary process, the reaction mixture was maintained at 75°C and additional sulfuric acid (0.5 equivalents) was added slowly. The reaction mixture was agitated for two more hours after the addition of the sulfuric acid. This reaction resulted in the formation of HCP in a PCE solution. The reaction was complete after two hours and an aliquot of the liquid was removed and the melting point was determined to establish complete conversion to HCP. *See* Expert Report of Dr. Francesco Stellacci (Jan. 12, 2009), at 3; *see also Cleary Statement* (Apr. 8, 2008), at 3.

Still maintaining the reaction mixture at 75°C, approximately one pound of calcium carbonate was added to the reaction vessel to neutralize the residual sulfuric acid globules. A fine powder form of Nuchar (10 lbs.) was added to the reaction vessel and the solution was stirred for approximately 30 minutes. Nuchar is a brand name for a form of carbon black; it is a fine particulate material made of carbon atoms similar to graphite. The solution was hot filtered to remove the Nuchar and calcium sulfate byproducts. The filter cake was then washed with additional PCE. Expert Report of Dr. Francesco Stellacci (Jan. 12, 2009), at 3; *see also Cleary Statement* (Apr. 8, 2008), at 3. This is the only step where Nuchar was added. The Nuchar was not reused in subsequent batches. *See* Expert Report of Dr. Francesco Stellacci (Jan. 12, 2009), at 3; *see also Cleary Statement* (Apr. 8, 2008), at 3.

The HCP solution, now in a fourth reaction vessel (and now "clear, almost colorless" because the Nuchar removed the color), was allowed to cool to room temperature, during which time some of the HCP precipitated out of the solution. Dep. of T. Cleary, *Emhart Indus., Inc. v. Home Ins. Co.*, C.A. No. 02-053-S (D.R.I.) (Feb. 10, 2003), at 42. This precipitate was collected by filtration, dried, placed in 50-lb. fiber drums, and sold as a "first crop" of pharmaceutical

grade HCP to Sterling-Winthrop, Inc. *See* Expert Report of Dr. Francesco Stellacci (Jan. 12, 2009), at 3; *see also Cleary Statement* (Apr. 8, 2008), at 3. The PCE from the filter press was recycled too. U.S. EPA, *Dioxins* (EPA-600/2-80-197) (Nov. 1980), at 108.

In the final step of the Cleary process, the remaining PCE-HCP solution (filtrate) was subjected to distillation to recover the PCE for reuse. Upon cooling, the additional HCP that precipitated out of the solution was collected by filtration, dried and sent to Kalo Laboratory as a second crop of HCP product. *See* Expert Report of Dr. Francesco Stellacci (Jan. 12, 2009), at 3; *see also Cleary Statement* (Apr. 8, 2008), at 4.

The Cleary process – from introduction of raw materials into the first reaction vessel to production of the final product – took approximately twenty-four hours per batch. *See Cleary Statement* (Apr. 8, 2008), at 1. This process did not involve the use of steel drums. *Id.* at 3; *see also* Dep. of V. Buonanno, *Emhart Indus., Inc. v. NECC*, C.A. No. 06-218-S (D.R.I.) (Oct. 22, 2008), at 96:12-15.

It has been suggested that unidentified "still bottoms" may have existed at the end of the Cleary process because such wastes were reported in a 1972 report by Radian Corporation addressing the Givaudan process. However, the Givaudan process differed from the Cleary process in many respects because Mr. Cleary specifically developed the patented Cleary process to avoid infringing the patent on the competing Givaudan process. Among other things, as previously highlighted, the Givaudan process was a single-vessel "continuous" process, whereas the Cleary process was a multi-vessel "batch" process. Additionally, there is no indication in the record that the Givaudan process, like the Cleary process, resulted in multiple "crops" of HCP product or reuse of the PCE solution from which those "crops" precipitated. *See* Expert Report of Dr. Francesco Stellacci (Jan. 12, 2009) at 3; *see also Cleary Statement* (Apr. 8, 2008), at 3-4;

U.S. EPA, *Dioxins* (EPA-600/2-80-197) (Nov. 1980), at 108.

Thus, no evidence exists from which to conclude that the Cleary process generated residual "still bottoms" requiring disposal. To the contrary, the patent for the Cleary process describes a manufacturing process that did not involve "still bottoms." Supplemental Expert Report of Dr. Francesco Stellacci (Dec. 24, 2009), at 3; *Dioxins* (EPA-600/2-80-197) (Nov. 1980), at 107.

2. No Contaminating Liquids Exited the HCP Building to the Site

a. There Were No Spills of Liquids from the Metro-Atlantic HCP Process

There is no evidence in the administrative record that any spills occurred at any stage of the HCP production process. Mr. Cleary testified that no spills occurred on delivery or in the course of the manufacturing process. *Cleary Statement* (Apr. 8, 2008), at 2. He testified that the delivery method was such that spills would not occur due to the equipment used to make the transfer of Na-2,4,5-TCP to the HCP reactor vessel. *Id.; see also* Supplemental Expert Report of Dr. James R. Kittrell (Nov. 7, 2011), at 21. It is highly unlikely that any such spills of the starter material occurred. That material was comprised of a liquid that rapidly evaporates leaving a strong phenolic odor that would cause severe human discomfort. As a consequence, the chemicals were maintained and transferred in a manner to avoid their exposure to the atmosphere. *See* Supplemental Expert Report of Dr. James R. Kittrell (Nov. 7, 2011), at 20-21*; see also* Expert Report of Dr. Francesco Stellacci (Jan. 12, 2009), at 2; *Cleary Statement* (Apr. 8, 2008), at 2.

Further, Metro-Atlantic had economic incentive to use all of the Na-2,4,5-TCP in its HCP manufacturing process and would not tolerate losses due to spillage. *See* Supplemental Expert Report of Dr. James R. Kittrell (Nov. 7, 2011), at 20-21; *see also* Supplemental Expert Report of

Dr. James R. Kittrell (May 5, 2010), at 3. Metro-Atlantic had a limited supply of the Na-2,4,5-TCP (not exceeding 25,000 kgs) from Diamond Alkali, which further supports the conclusion that losses due to spillage would not be tolerated. *See* Dep. of T. Cleary, *Emhart Indus., Inc. v. Home Ins. Co.*, C.A. No. 02-053-S (D.R.I.) (Feb. 10, 2003), at Exh. 15.

There is no expert opinion to support the conclusion that there were spills. None of the NECC experts offers an opinion that liquids exited the hexachlorophene plant. Dr. Barbara Taylor, Mr. David Mauro, Mr. Martin Bide, and Ms. Muriel Robinette do not address the physical plant operation and supposed pathways for liquids to exit the plant into the environment; nor did any of the other NECC experts.

After presenting a detailed, but incorrect description of his understanding of the chemical process occurring at the HCP plant, Dr. Jurgen Exner testified that he was offering no opinion that liquids exited the plant. He did present, with no basis in fact or scientific reasoning (and contrary to the testimony and statements of the designer of the plant, Mr. Cleary), the wholly speculative view that Na-2,4,5-TCP was discharged from the hose of the tanker truck that delivered the product to the plant. Dr. Exner did so without any knowledge of the type of truck used, the system for pumping product, or the existence of valves and purging mechanisms and the like. In fact, Dr. Exner had no knowledge of the mechanisms or procedures for delivering fluids from tanker trucks in the 1960s or at any other time. Accordingly, his speculation about spillage during the delivery of Na-2,4,5-TCP is not a valid basis for the EPA's conceptual site model and stands in no better stead than EPA's initial baseless speculation.

Dr. Exner offered the further opinion, contrary to the direct testimony of Mr. Cleary, that the Na-2,4,5-TCP was delivered to a storage tank at the HCP building. In addition to being contrary to direct testimony, this opinion further demonstrates a failure to understand the HCP

manufacturing process and is inconsistent with the physical features of the HCP plant observable from aerial photographs. Specifically, in addition to using the Na-2,4,5-TCP "starter" material, Metro-Atlantic used *and recycled* three other fluids during the HCP manufacturing process: sodium hydroxide, sulfuric acid, and perchloroethylene. *Cleary Statement* (Apr. 8, 2008), at 2-3. Each of these three recycled fluids required a separate tank for storage and recycling purposes. *See* Supplemental Expert Report of Dr. James R. Kittrell (Jan. 7, 2011), at 22. And, in fact, exactly three storage tanks are visible in the aerial photographs of the HCP building and Site: two vertical tanks, suitable for storage and recycling of perchloroethylene and sodium hydroxide, and one smaller, horizontal tank, suitable for recycling sulfuric acid. *Id.* at 38. There are no additional storage tanks visible in any aerial photographs; thus, there is no evidence that Metro-Atlantic also stored Na-2,4,5-TCP in an on-Site tank.

b. <u>All Liquids Associated with HCP Manufacturing Were Discarded into the Municipal Sewer</u>

While it has been suggested that 2,3,7,8-TCDD might have been present in the HCP process from an alleged aqueous (water) waste stream and then discarded, this hypothetical scenario ignores the fact that the solubility of 2,3,7,8-TCDD in water is extremely low: only 0.000317 ppm (or 0.317 ppb). Supplemental Expert Report of Dr. Francesco Stellacci (Dec. 24, 2009), at 3. Thus, any aqueous waste streams disposed of from the HCP manufacturing operation would contain very little 2,3,7,8-TCDD (*i.e.,* on the order of 5 micrograms total for the duration of the HCP manufacturing process). Most importantly, this speculative argument ignores the compelling evidence that, to the extent there was any aqueous liquid waste from the HCP process, it would have been disposed of into the municipal sewer system, not the River or the Site, and thereafter would not be found at the Site. *See* Town Council of North Providence, Meeting Minutes (Jul. 6, 1964), at 3 (during visit to Metro-Atlantic, "all chemical waste was

deposited through the sewer system"); *see also* Trial Transcript of J. Buonanno, *Emhart Indus., Inc. v. NECC*, C.A. No. 06-218-S (D.R.I.) (Jan. 14, 2009), at 38-40; Supplemental Expert Report of Dr. James R. Kittrell (Nov. 7, 2011), at 25.

The sewer connections to the Site were available by the early 1940s. *See* Easement (Jan. 4, 1941) (beginning at Smith Street and running south down Mill Street); Easement (Oct. 7, 1939) (running along tailrace south of Steere Avenue); Easement (Jan. 23, 1939) (running north from Grover Street; parallel to tailrace); Easement (Jan. 17, 1939) (running mostly parallel to tailrace, to the north and south of Redfern Street, but cutting across the tailrace two plats north of Redfern Street); Easement (Jan. 17, 1939) (running south from Redfern Street, parallel to tailrace); Easement (Jan. 24, 1939) (running north from George Street, parallel to the tailrace); Easement (Oct. 2, 1940) (running south from George Street, parallel to the tailrace, and across Grover Street, cutting across portion of Site); Easement (Oct. 2, 1940) (running north from Stevens street along tailrace). Furthermore, in 1956, the local plumbing code enacted required that facilities be connected to the sewer system, where such connections were available. *See* Building Ordinance of the City of Providence, Article 17, Chapter 1700.0, *et al.* (1956).

Metro-Atlantic's main plant, which housed its textile operations, was connected to the sewer before the operations commenced at the HCP building. *See* Town Council of North Providence, Meeting Minutes (Oct. 1, 1956), at 1 ("Metro-Atlantic Co. has tied in its domestic sewage system with the Town."). When the HCP building was constructed, it also was connected to the existing sewer system. *See* Trial Transcript of J. Buonanno, *Emhart Indus., Inc. v. NECC*, C.A. No. 06-218-S (D.R.I.) (Jan. 14, 2009), at 38:19-39:2. This was further confirmed when pipes connecting the HCP plant to the sewer were unearthed in 2010 during the Time Critical Removal Action that was conducted at the Site. *See* Supplemental Expert Report of Dr.

James R. Kittrell (May 5, 2010), at 2; LEA-001237; LEA-002018; LEA-001283; Bennett Soil Boring Sample Tracings (Mar. 22, 2010) (showing location of pipes unearthed).

Also, Metro-Atlantic did not use a septic system to manage its waste. *See* Trial Transcript of J. Buonanno, *Emhart Indus., Inc. v. NECC*, C.A. No. 06-218-S (D.R.I.) (Jan. 14, 2009), at 38:22-39:4; Supplemental Expert Report of Dr. James R. Kittrell (May 5, 2010), at 2; Addendum to Expert Report of John R. Kastrinos (Mar. 31, 2010), at 6. Nor did it use dry wells or leaching pits. Addendum to Expert Report of John R. Kastrinos (Mar. 31, 2010), at 6. Given that Metro-Atlantic was connected to the sewer, any alleged aqueous waste from the HCP building would have been disposed of in the sewer. *See* Town Council of North Providence, Meeting Minutes (Jul. 6, 1964), at 3 (during visit to Metro-Atlantic, "all chemical waste was deposited through the sewer system"); Supplemental Expert Report of Dr. James R. Kittrell (Nov. 7, 2011), at 25; Supplemental Expert Report of Dr. James R. Kittrell (May 5, 2010), at 2; Trial Transcript of J. Buonanno, *Emhart Indus., Inc. v. NECC*, C.A. No. 06-218-S (D.R.I.) (Jan. 14, 2009), at 38:15-40:5, 42:8-44:8; Trial Transcript of J. Buonanno, *Emhart Indus., Inc. v. Home Ins., Co.*, C.A. No. 02-053-S (D.R.I.) (Sep. 14, 2006), at 85:7-19; Dep. of D. Paterson, *Emhart Indus., Inc. v. Home Ins., Co.*, C.A. No. 02-053-ML (D.R.I.) (Dec. 20, 2002), at 9:8-15; Trial Transcript of J. Priest, *Emhart Indus., Inc. v. Home Ins., Co.*, C.A. No. 02-053-S (D.R.I.) (Jan. 17, 2003), at 25:12-26:3; Dep. of J. Buonanno, *Emhart Indus., Inc. v. Home Ins., Co.*, C.A. No. 02-053-S (D.R.I.) (Jan. 17, 2003), at 15:3-14, 16:20-17:1, 116:6-11. Thus, no such alleged aqueous waste material would have been disposed of into the River or onto the ground at the Site. *See* Trial Transcript of J. Buonanno, *Emhart Indus., Inc. v. NECC*, C.A. No.06-218-S (D.R.I.) (Jan. 14, 2009), at 39.

3. The Nuchar Used in the HCP Manufacturing Process Removed Any 2,3,7,8-TCDD and other Dioxins and Was Disposed of Off-Site

Although it has been suggested that some dioxin might have been present as a contaminant in the Na-2,4,5-TCP starter material supplied to Metro-Atlantic by Diamond Alkali, any dioxin that might have been present as a contaminant was removed by the Nuchar that was added to the reaction. *See* Rebuttal Expert Report of Dr. Francesco Stellacci (Oct. 27, 2011), at 3-4; *see also* Expert Report of Dr. Francesco Stellacci (Jan. 12, 2009), at 5; Expert Report of Dr. Francesco Stellacci (Jan. 10, 2011), at 1. The HCP process incorporated a decolorization step in which Nuchar was added to the reaction mixture. Nuchar has a large surface with a high affinity (*i.e.*, strongly attractive) to planar molecules such as dioxins or furans. Once a planar molecule with delocalized electrons (such as dioxin or hexachloroxanthene) binds to graphitic carbon, it does not detach. *See* Rebuttal Expert Report of Dr. Francesco Stellacci (Oct. 27, 2011), at 2. Carbon materials (when in graphitic form) are very rich in such electrons. Hence, the Nuchar would strongly attract small molecules such as dioxins that have delocalized electrons. *Id.*; *see also* Expert Report of Dr. Francesco Stellacci (Jan. 12, 2009), at 4.

Nuchar was used as a means to decolorize the final product because, in the HCP product, color was determined by the presence of small quantities of molecules with delocalized electrons. *See* Rebuttal Expert Report of Dr. Francesco Stellacci (Oct. 27, 2011), at 1. While the Nuchar was in contact with the reaction mixture (during the second to last step in the HCP production process), the Nuchar acted like a sponge, attracting and trapping all of the planar molecules (*e.g.*, dioxins/furans) that were present with delocalized electrons. Thus, Nuchar was the perfect material of choice to remove such planar molecules. *Id.* at 4. The effectiveness of the Nuchar filtration is evident in Mr. Cleary's testimony that the resulting liquid was clear, almost colorless. *See* Dep. of T. Cleary, *Emhart Indus., Inc. v. Home Ins. Co.*, C.A. No. 02-053-

S (D.R.I.) (Feb. 10, 2003), at 42.

The quantity of the Nuchar used in the Metro-Atlantic HCP manufacturing process was sufficient to adsorb all of the dioxin from the solution mixture. In fact, more than 100 times the Nuchar needed to adsorb the dioxin was used in this stage of the process. In other words, 0.1 lbs. of Nuchar would have been sufficient to remove irreversibly all the dioxin from the reaction, yet Metro-Atlantic used 10 lbs. per batch treatment. Expert Report of Dr. Francesco Stellacci (Jan. 12, 2009), at 5-6.

The Cleary process of manufacturing HCP did not independently produce additional dioxin or any similar molecules. Such molecules were not generated even as trace by-products. *Id.* at 4; *Dioxins* (EPA-600/2-80-197) (Nov. 1980), at 107. Even if, as suggested, hexachloroxanthene ("HCX") had been present in the reaction vessel or potentially generated in connection with the Cleary process, it too would have been adsorbed on the Nuchar. HCX, like dioxin, is a planar molecule with delocalized electrons. Hence, for the reasons described above, HCX also would have been adsorbed on the free adsorption sites of the Nuchar. Expert Report of Dr. Francesco Stellacci (Jan. 12, 2009), at 4.

While it has been suggested that the dioxin at the Site may have resulted from Metro-Atlantic discarding Nuchar and other filter solids on the Site, there is no such evidence in the record. In fact, Metro-Atlantic disposed of the Nuchar by placing it in a dumpster that was trucked off the Site, as Metro-Atlantic did with other solid wastes in 1964 and 1965. *See* Supplemental Expert Report of Dr. James R. Kittrell (Nov. 7, 2011), at 7; *see also* Trial Transcript of J. Buonanno, *Emhart Indus., Inc. v. Home Ins., Co.*, C.A. No. 02-053-S (D.R.I.) (Sep. 14, 2006), at 87:3-11; Trial Transcript of J. Nadeau, *Emhart Indus., Inc. v. Home Ins., Co.*, C.A. No. 02-053-S (D.R.I.) (Sep. 15, 2006), at 27:23-28:8, 48:5-49:10; Trial Transcript of J.

Turcone, *Emhart Indus., Inc. v. Home Ins., Co.*, C.A. No. 02-053-S (D.R.I.) (Sep. 18, 2006), at 5-7.

The application of internal standard recovery procedures used by EPA to validate its analytical procedures in extracting dioxin from Site samples further dispels any suggestion that the spent Nuchar was disposed of on the ground at the Site, given the absence of activated carbon in the samples analyzed. Expert Report of Dr. Francesco Stellacci (Jan. 12, 2009), at 9.

NECC has submitted no credible rebuttal to Dr. Stellacci's internal standard recovery analysis. Dr. Jurgen Exner, who testified that he has no expertise whatsoever regarding activated carbon of the type used by Metro-Atlantic, has offered the unsubstantiated opinion that there was insufficient activated carbon used to remove all of the 2,3,7,8-TCDD from the Metro-Atlantic HCP process. This opinion is based upon Dr. Exner's misinterpretation and selective use of a single literature data point, which is unrelated to Metro-Atlantic's use of activated carbon. By offering this opinion, Dr. Exner – who stated at his deposition that he is not holding himself out as an activated carbon expert – demonstrates that he lacks even a fundamental understanding of the properties of activated carbon or its mode of action. Similarly, Mr. David Mauro also challenged whether Metro-Atlantic used sufficient activated carbon to remove all 2,3,7,8-TCDD and whether such carbon would be active today, but he admitted at his deposition that he has "little" practical experience with solvents in relation to activated carbon and that he has no formal educational experience whatsoever with respect to activated carbon. In short, NECC has not provided any data, literature, or qualified expert opinion testimony to dispute the conclusion that Metro-Atlantic could not have disposed of activated carbon on the Site.

4. The Isomers, Congeners and Furans in Site Samples Show that the 2,3,7,8-TCDD Could Not Have Come From the Na-2,4,5-TCP Used in Metro-Atlantic's HCP Process

The scientific evidence also supports the conclusion that 2,3,7,8-TCDD identified in

samples on the Site did not come from the Na-2,4,5-TCP starter material that Metro-Atlantic used in its HCP manufacturing process. The chemical reaction that produces the Na-2,4,5-TCP made by Diamond Alkali also produces a variety of dioxin and furan congeners, including 2,3,7,8-tetrachlorodibenzofuran ("2,3,7,8-TCDF"), that are contaminants in the Na-2,4,5-TCP product. Unless Na-2,4,5-TCP is purified, the 2,3,7,8-TCDD produced is accompanied by other dioxin and furans congeners. *See* Expert Report of Dr. Gregory Fu (Jan. 7, 2011), at 5. However, various manufacturing processes and purification techniques alter the dioxin/furan pattern of the dioxin contaminants. *See* Supplemental Expert Report of Dr. James R. Kittrell (Nov. 7, 2011), at 12-14; Supplemental Expert Report of Dr. James R. Kittrell (Jan. 7, 2011), at 14-15. Thus, 2,3,7,8-TCDD, coupled with the other dioxin/furan patterns, constitute unique fingerprints indicating whether it results from a purified or unpurified source of 2,4,5-TCP. *Id.*

The Site samples contain 2,3,7,8-TCDD produced from a manufacturing source (as well as 2,3,7,8-TCDD produced from combustion). Supplemental Expert Report of Dr. James R. Kittrell (Nov. 7, 2011), at 45. The dioxin/furan pattern from a manufactured source, found in Site samples (*i.e.*, those samples that predominantly contain only high concentrations of 2,3,7,8-TCDD) demonstrates conclusively that the 2,3,7,8-TCDD did not come from the Na-2,4,5-TCP Metro-Atlantic purchased from Diamond Alkali in the 1964-1965 time period for use in its HCP operation. *Id.* at 38-39; Dep. of Dr. James R. Kittrell, *Emhart Indus., Inc. v. NECC*, C.A. No. 06-218-S (D.R.I.) (Sep. 21, 2011), at 57:9-19.

The Na-2,4,5-TCP produced by Diamond Alkali at that time was not purified. Supplemental Expert Report of Dr. James R. Kittrell (Nov. 7, 2011), at 39; *see also Cleary Statement* (Apr. 8, 2008), at 1; Dep. of T. Cleary, *Emhart Indus., Inc. v. Home Ins. Co.*, C.A. No. 02-053-S (D.R.I.) (Feb. 10, 2003), at 40. Therefore, other dioxins and furans were present in

Diamond Alkali's Na-2,4,5-TCP, along with the 2,3,7,8-TCDD. Supplemental Expert Report of Dr. James R. Kittrell (Nov. 7, 2011), at 39. However, there were little or no other dioxin or furan congeners found in Site samples with the 2,3,7,8-TCDD produced from a manufacturing source. *Id.* at 38. Thus, the 2,3,7,8-TCDD found at the Site was from a purified product. *See* Expert Report of Dr. Gregory Fu (May 6, 2010), at 5. Accordingly, it could not have come from the 1964-1965 Diamond Alkali product used by Metro-Atlantic. Supplemental Expert Report of Dr. James R. Kittrell (Nov. 7, 2011),at 38-39; Dep. of Dr. James R. Kittrell, *Emhart Indus., Inc. v. NECC*, C.A. No. 06-218-S (D.R.I.) (Sep. 21, 2011), at 67:15-21.

The National Institute of Occupational Safety and Health Dioxin Registry Reports ("NIOSH Reports") indicate that it was not until September 1967 that Diamond Alkali began to purify its Na-2,4,5-TCP, with a carbon cartridge filtration system. Supplemental Expert Report of Dr. James R. Kittrell (Nov. 7, 2011), at 14. However, unlike other manufacturers' purification processes, Diamond Alkali's process did not alter the dioxin/furan profile. *See* Supplemental Expert Report of Dr. James R. Kittrell (Jan. 7, 2011), at 9. Rather, Diamond Alkali's purification method lowered the concentrations of <u>all</u> dioxins and furans uniformly. Consequently, even the post-1967 purified Diamond Alkali Na-2,4,5-TCP would have contained a whole family of dioxin and furan congeners (albeit at lower total concentrations). Therefore, the 2,3,7,8-TCDD found on the Site could not have originated from the post-1967 Diamond Alkali product either.

Also, Diamond Alkali's manufacture of Na-2,4,5-TCP resulted in the formation of 2,3,7,8-tetrachlorodibenzofuran ("2,3,7,8-TCDF"). *See* Expert Report of Dr. Gregory Fu (Nov. 4, 2011), at 2; Expert Report of Dr. Gregory Fu (Jan. 7, 2011), at 5; *see also* Supplemental Expert Report of Dr. James R. Kittrell (Nov. 7, 2011), at 14. The absence of 2,3,7,8-TCDF in

the Site samples predominantly containing only high concentrations of 2,3,7,8-TCDD is further evidence that the 2,3,7,8-TCDD found on the Site did not originate from the Diamond Alkali Na-2,4,5-TCP. *See* Expert Report of Dr. Gregory Fu (Jan. 7, 2011), at 5; *see also* Supplemental Expert Report of Dr. James R. Kittrell (Nov. 7, 2011), at 14, 39; Supplemental Expert Report of Dr. James R. Kittrell (Jan. 7, 2011), at 26 ("Dioxin congener profiles of the 'source-like' samples at the Site are not consistent with Crude TCP delivered to the Site from Diamond Alkali in 1964-1965.").

5. No Dioxin Was Generated in Metro-Atlantic's HCP Manufacturing Process

It has been speculated by NECC's experts that additional dioxin was generated during the manufacture of HCP at Metro-Atlantic. That speculation lacks a scientific basis.

First, NECC's experts do not disclose literature citations to support their description of HCP manufacturing at Metro-Atlantic. In fact, the available literature concerning HCP manufacturing is contrary to their unsupported and entirely speculative opinions.

Second, NECC's experts appear to either disregard or completely ignore their own cited literature publications concerning the manufacture of HCP, which state that additional dioxins are not generated during the manufacture of HCP.

Third, the temperature and pH conditions under which Metro-Atlantic manufactured HCP would not have generated dioxins. The temperatures used in the manufacture of HCP are maintained at 100° C, which is *below* the temperature at which dioxin is known to form. *Dioxins* (EPA-600/2-80-197) (Nov. 1980), at 107-08. Moreover, Metro-Atlantic maintained the acidic conditions throughout the production of HCP, as distinguished from the excessive alkaline conditions used in TCP manufacture.

Lastly, even aside from the temperature and pH conditions used during HCP

manufacture, NECC's experts fail to recognize that the HCP process is run at ambient (atmospheric) pressure, compared to the high pressure – 350 psig – used during TCP manufacturing. This omission further demonstrates that NECC's experts lack a fundamental understanding of Metro-Atlantic's HCP reaction conditions, organic chemistry, reaction by-product formation, and the mechanism by which organic chemical reactions proceed.

C. NECC's Drum Reconditioning Process Generated and Was the Source of Dioxins at the Site

NECC brought to the Site customers' drums that contained 2,4,5-TCP, dioxin congeners including, but not limited to 2,3,7,8-TCDD, and other chemicals that degraded to 2,4,5-TCP or, when incinerated alone or in combination with other compounds, produced polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans ("PCDDs/PCDFs"). In erroneously determining that RCRA and the F020 waste code apply to the contaminated environmental media at the Site, EPA completely disregards this well-documented dioxin source.

1. Overview of NECC's Operations at the Site

From approximately 1952 to 1972, NECC operated a drum reconditioning facility on a portion of the Site located on a peninsula bordered by U.S. Route 44, the Woonasquatucket River ("River"), and the tail race. *See* NECC Supp'l CERCLA § 104(e) Response (Feb. 8, 2002). NECC's buildings were located along the tail race, a narrow channel with an upstream section, known as the head race, that is no longer connected to the River. The head race was filled prior to 1956. The tail race enters Allendale Pond near the southern terminus of the Peninsula. Historic aerial photographs indicate that NECC also used other areas of the Site for movement, storage and staging of drums, including an open area west of its buildings, various areas along the River, and an access road that roughly paralleled the River.

There were spills and leaks onto the ground from the drums prior to reconditioning. *See*

Dep. of R. Nadeau, *Emhart Indus., Inc. v. Home Ins. Co.*, C.A. No. 02-053-S (D.R.I.) (Dec. 17, 2002), at 12-13; Dep. of J. Cifelli, *Emhart Indus., Inc. v. Home Ins. Co.*, C.A. No. 02-053-S (D.R.I.) (Feb. 13, 2003), at 29-30; Dep. of C. Maine, *Emhart Indus., Inc. v NECC*, C.A. No. 06-218-S (D.R.I) (Apr. 29, 2009), at 12-13. NECC also buried drums that were not reconditioned in the southern portion of the Site. *See* Aff. of E. Izzo (Oct. 28, 2000); *see also* Admin. Dep. of T. Cambio, *In the Matter of: Centredale Manor Superfund Site, North Providence, Rhode Island* (Jun. 30, 1999), at 22-23.

As part of the reconditioning process, NECC moved drums through a furnace by placing them upside down on a conveyor. *See* Dep. of R. Nadeau, *Emhart Indus., Inc. v. Home Ins. Co.*, C.A. No. 02-053-S (D.R.I.) (Dec. 17, 2002), at 12; Dep. of J. Cifelli, *Emhart Indus., Inc. v. Home Ins. Co.*, C.A. No. 02-053-S (D.R.I.) (Feb. 13, 2003), at 19. Any liquid or sludge remaining in the drums was washed into an unlined earthen pit, drained into a cement pit under the conveyor, or was spilled onto the ground. *See* Dep. of R. Nadeau, *Emhart Indus., Inc. v. Home Ins. Co.*, C.A. No. 02-053-S (D.R.I.) (Dec. 17, 2002), at 12, 32; Dep. of J. Cifelli, *Emhart Indus., Inc. v. Home Ins. Co.*, C.A. No. 02-053-S (D.R.I.) (Feb. 13, 2003), at 19, 22; Dep. of C. Maine, *Emhart Indus., Inc. v NECC*, C.A. No. 06-218-S (D.R.I) (Apr. 29, 2009), at 12-13. When the pit was full, the material, including residual chemicals and ash from the furnace, was taken to an area south of the facility and dumped. *See* Dep. of R. Nadeau, *Emhart Indus., Inc. v. Home Ins. Co.*, C.A. No. 02-053-S (D.R.I.) (Dec. 17, 2002), at 12-13, 31-32.

NECC also had a drum washing operation in which closed head drums were washed in caustic liquid baths. *See* Dep. of T. Lussier, *Emhart Indus., Inc. v. NECC*, C.A. No. 06-218-S (D.R.I.) (Apr. 30, 2009), at 29-30; *see also* Dep. of R. Nadeau, *Russell-Stanley Holdings, Inc. v. Vincent J. Buonanno*, C.A. No. 01-cv-2818 (S.D.N.Y.) (Oct. 1, 2002), at 39:18-23, 41:18-42:4;

Dep. of J. Cifelli, *Emhart Indus., Inc. v. Home Ins. Co.*, C.A. No. 02-053-S (D.R.I.) (Feb. 13, 2003), at 42:4-51:1. Substantial amounts of contaminated liquids were released to the Site from this operation, which according to the aerial photographs necessitated that NECC build a retaining wall and create an impoundment for their liquid releases. *See* Expert Rebuttal Report of Robert D. Mutch (Dec. 11, 2009), at 3, 6-7; s*ee also* Dep. of C. Maine, *Emhart Indus., Inc. v. NECC*, C.A. No. 06-218-S (D.R.I.) (Apr. 29, 2009), at 9:5-7, 9:18-21; 12:20-13:10, 17:18-24, 30:1-9, Exh. 2. In fact, NECC constructed a wastewater impoundment into which wastewater from its operations was conveyed. *See* Expert Rebuttal Report of Robert D. Mutch (Dec. 11, 2009), at 3, 6-7.

2. <u>Chemicals Sent to the Site by NECC's Customers</u>

At the Site, between approximately 1952 and 1972, NECC received 55-gallon steel drums from at least 10 customers in the chemical and petroleum industry, and from two military bases (*i.e.*, 4800 drums from Quonset Naval Base ("Quonset") and Otis Air Base ("Otis")) containing approximately 370 different chemical residues, including compounds likely containing 2,3,7,8-TCDD, 2,4,5-TCP precursors, and PCBs. *See* Supplemental Expert Report of Dr. James R. Kittrell (Nov. 7, 2011), at 6, 38; *see also* Supplemental Expert Report of Dr. James R. Kittrell (Jan. 7, 2011), at 26; Expert Report of Dr. James R. Kittrell (Jan. 15, 2009), at 27; RI Report, at 4-12 to 4-13 ("[t]he former drum reconditioning facility probably received chemical shipping and storage containers from numerous sources and may be the original source of the PCBs. The former drum reconditioning operation in the source area likely washed pesticide and PCB residues into the source area soils."). These customers and chemical residues are identified in the expert report of Dr. James R. Kittrell (Jan. 15, 2009).

Moreover, NECC received 55-gallon steel drums from at least nineteen (19) customers in the textile chemical industry during the relevant time period. These drums contained

approximately 650 different chemical residues from dyes, pigments, textile auxiliary, specialty finishing chemicals and waste products. The chemical residues included mineral acids, organic acids, alkalis and salts, and other organic chemicals (*e.g.*, chlorinated solvents, alcohols, aromatic hydrocarbons, aliphatic hydrocarbons, and other oils, fats and waxes). These customers and chemical residues are identified in the expert report of Dr. Richard Aspland (Jan. 13, 2009). Other chemicals came from customers that were not in the textile chemical business. These chemicals were identified by Dr. Kittrell. *See generally*, Expert Report of Dr. James R. Kittrell (Jan. 15, 2009). Further, chemicals identified by Dr. Kittrell as coming from NECC customers to the Site were identified in Site samples. *See id.*; Expert Report of Dr. Gregory C. Fu (Jan. 12, 2009), at 29.

Numerous chemicals that were handled by NECC's customers in 55-gallon drums during the relevant time period have been detected as contaminants in samples taken at the Site. *See* Updated Expert Report of Dr. Gregory Fu (Feb. 6, 2009). According to Professor Fu, a Firmenich Professor of organic chemistry at the Massachusetts Institute of Technology ("MIT"), of the various chemical residues present in 55-gallon steel drums received by NECC for reconditioning, nine contained dioxins as a contaminant. *See id.* at 5. Certain compounds or formulations that were sent to the Site from Quonset and Otis, such as Silvex and 2,4,5-trichlorophenoxyacetic acid ("2,4,5-T"), degrade swiftly to 2,4,5-TCP and also are contaminated with 2,3,7,8-TCDD. *See* Supplemental Expert Report of Dr. James R. Kittrell (Jan. 7, 2011), at 29.

The administrative record is clear that NECC received chemicals from its customers that contained 2,3,7,8-TCDD, and, as discussed below, other chemicals that when incinerated generated 2,3,7,8-TCDD. *See id.* at 7-9; *see also* Updated Expert Report of Dr. Gregory Fu

(Feb. 6, 2009), at 5, 20.

3. The Dioxin Found in Site Samples Compels the Conclusion that It Came from NECC's Customers

a. NECC's Incineration Process Created 2,3,7,8-TCDD and Other Dioxins

Dioxins and furans were generated during NECC's drum reconditioning operation via two known pathways: the "precursor" route and the "de novo" route, when organic chemicals are incinerated. *See* Expert Report of Dr. Gregory C. Fu (Jan. 12, 2009), at 3. The precursor route forms dioxins and furans during incineration, by having a chemical with the aromatic ring preformed prior to incineration. *Id.* The de novo route requires a carbon source, a chlorine source, and heat. *Id.* Conditions in the NECC incinerator were conducive to the formation of dioxins and furans by both routes during the 25 years of NECC's incineration operation. *Id.* Furthermore, as discussed above, some chemicals delivered to the Site contained dioxins and furans as an artifact of their own manufacturing conditions. *Id.* NECC's incineration process was a source of dioxins and furans to the Site and did not affect chemicals received at the Site that already contained dioxins and furans.

b. Dioxin-Containing Chemicals Manufactured by Companies Other than Diamond Alkali Were Disposed of on the Site

2,3,7,8-TCDD and other dioxins and furans are contained in 2,4,5-TCP, Silvex and 2,4,5-T, all of which were detected on the Site. The mix of dioxin congeners and isomers present in these products, as well as their mix of furans, varies from manufacturer to manufacturer and according to the time of manufacture. *See* Supplemental Expert Report of Dr. James R. Kittrell (Jan. 7, 2011), at 6. Analysis of the congener, isomer and furan patterns, therefore, can help identify the manufacturer and time of manufacture of a given 2,3,7,8-TCDD-containing product. *Id.* In the case of the Site, such analysis demonstrates that the 2,3,7,8-TCDD from a

manufactured source that was detected on the Site could not have originated in the 2,4,5-TCP product that Diamond Alkali supplied to Metro-Atlantic; rather, it likely came from residuals in the drums that NECC's customers shipped to the Site for refurbishing. *Id.* at 7.

Reports prepared the National Institute of Occupational Safety ("NIOSH") detail the manufacturing processes employed in the 1960s by the manufacturers of 2,4,5-TCP, which is used to manufacture both 2,4,5-T and Silvex. *Id.* at 5. These processes enable a qualified chemist and chemical process engineer to determine the congener, isomer and furan content of the 2,4,5-TCP of different manufacturers. *Id.* at 6. In the absence of actual samples of these chemicals as they were manufactured in the 1960s, the NIOSH reports, properly understood, provide the best evidence of the components of the 2,4,5-TCP manufactured at that time by various manufacturers.

The administrative record demonstrates that 2,3,7,8-TCDD detected on the Site could not have come from the crude Na-2,4,5-TCP supplied by Diamond Alkali to Metro Atlantic. Specifically, the 2,3,7,8-TCDD profile found at the Site is from a purified Na-2,4,5-TCP, with a congener profile distinct from that of Na-2,4,5-TCP purchased from Diamond Alkali by Metro-Atlantic. *Id.* at 4. As discussed, unlike some other manufacturers, Diamond Alkali did not use a purification process that altered the dioxin/furan congener patterns at the time it was supplying Na-2,4,5-TCP to Metro-Atlantic. *Id.* at 2.

As early as 1965, manufacturers other than Diamond Alkali began purifying their Na-2,4,5-TCP in an attempt to remove the 2,3,7,8-TCDD by-products. Supplemental Expert Report of Dr. James R. Kittrell (Nov. 7, 2011), at 15. Dow's manufacturing procedure, for example, included a TCA decantation process to remove the dioxin by-products from its Na-2,4,5-TCP *See* DAVID A. MARLOW, ET AL., DIOXIN REGISTRY REPORT OF THE DOW CHEMICAL CO. (Jan.

1991), at 16. This procedure removed the higher chlorinated dioxin congeners, leaving a small amount of 2,3,7,8-TCDD, but virtually none of the other dioxin congeners. *See* Supplemental Expert Report of Dr. James R. Kittrell (Jan. 7, 2011), at 24-25.

In 1967, another producer of Na-2,4,5-TCP, Occidental Chemical Company (f/k/a Hooker Chemical), purified its 2,4,5-TCP by vacuum distillation. The vacuum distillation method did not remove all 2,3,7,8-TCDD from the 2,4,5-TCP, however, but left up to 1 ppm 2,3,7,8-TCDD in the 2,4,5-TCP. *See Id.* at 21. Since the boiling points of the dioxin congeners other than 2,3,7,8-TCDD are higher than that of 2,3,7,8-TCDD, in this purification process the dioxin congeners other than 2,3,7,8-TCDD would not boil off with the purified 2,4,5-TCP. Accordingly, the 2,4,5-TCP purified by a vacuum distillation process would have a dioxin congener profile with 2,3,7,8-TCDD but little or no other dioxin or furan congeners. The samples from the Site have such a profile.

The "purified" dioxin profile found at the Site compels the conclusion that this dioxin could not have come from the crude Diamond Alkali Na-2,4,5-TCP used by Metro-Atlantic. Supplemental Expert Report of Dr. James R. Kittrell (Nov. 7, 2011), at 38. Rather, more likely than not, this dioxin came from the materials in NECC's customers' drums, specifically the drums from the military. *See id.* at 1-2, 5-6, 38 ("the source of the 2,3,7,8-TCDD contamination at the CMRP site was more likely than not due to spillage, leakage from, or dumping of, barrels from the NECC barrel reclamation facility on the CMRP site, such as the 2400 drums NECC received from Quonset Naval Base, and the 2400 drums that NECC received from Otis Air Force Base in 1969"); *see also* Supplemental Expert Report of Dr. James R. Kittrell (Jan. 7, 2011), at 4, 26 (stating that the contamination more likely than not "originated from NECC barrels brought on Site and stored in the vicinity of the Metro-Atlantic plant and originating from herbicides

leaking from those barrels").

D. Conclusion

As the administrative record makes clear, the 2,3,7,8-TCDD at the Site resulted from the NECC operation and not from the Metro Atlantic HCP manufacturing plant. EPA lacks a supporting foundation for its speculation that the 2,3,7,8-TCDD found on the Site came from the Metro-Atlantic HCP operation. EPA ignores compelling fact and scientific evidence throughout the administrative record that the 2,3,7,8 TCDD detected on the Site came from discharges in connection with the NECC operation and not from the Metro Atlantic HCP manufacturing plant. This speculation has further caused EPA to erroneously apply the RCRA F020 waste code to the contaminated environmental media at the Site.

In light of the foregoing, EPA must re-evaluate the remedial alternatives and the remedies selected in the PRAP, based on an accurate and comprehensive analysis of the scientific data and factual information currently available.

APPENDIX B: SUMMARY OF APPLICABLE LAWS, REGULATIONS, AND GUIDANCE

A. CERCLA and NCP Requirements for Remedy Selection

1. CERCLA § 121

Section 121 of the Comprehensive Environmental Response, Compensation and Liability Act ("CERCLA") sets forth the requirements for selecting remedial actions at CERCLA sites, including the Site at issue here. *See* 42 U.S.C. § 9621. CERCLA § 121 requires the selection of remedies that comply with the NCP, are highly reliable, and provide long-term protection of human health and the environment. *Id.* § 9621(a). Cost-effectiveness is an essential requirement for any remedial action selected for a CERCLA site. *Id.* § 9621(a) & (b). Section 121 also requires selected remedial actions to comply with legally "applicable or relevant and appropriate requirements" ("ARARs"), which are cleanup standards and other environmental protection standards and criteria established under federal law, and under state law if the state requirements are more stringent than federal obligations. *Id.* § 9621(d).

CERCLA § 121(e)(1) provides that "[n]o Federal, State, or local permit shall be required for the portion of any removal or remedial action conducted entirely onsite, where such remedial action is selected and carried out in compliance with this section." 42 U.S.C. § 9621(e)(1). The National Contingency Plan ("NCP") defines "on-Site" as "the areal extent of contamination and all suitable areas in very close proximity to the contamination necessary for implementation of the response action." 40 C.F.R. § 300.400(e)(1). For an area to qualify as "on-Site," it must be (1) necessary for implementation of a response action, (2) suitable, and (3) in very close proximity to the contamination area. *U.S. v. General Electric Co.*, 460 F. Supp. 2d 395, 403 (N.D.N.Y. 2006). The definition of "on-Site" is broader than the related concept of "area of contamination" and, thus, provides flexibility when implementation of the response action

requires activities outside the area of contamination itself and/or areas not contiguous with the site. *See* U.S. EPA, *Introduction to ARARs: Applicable or Relevant and Appropriate Requirements* (Jun. 1992), at 5.

2. NCP Requirements

a. Development of Conceptual Site Model

The NCP requires the Environmental Protection Agency ("EPA") to develop a "conceptual site model" at the earliest stages of the RI process. *See* 40 C.F.R. § 300.430(b)(2) (EPA "shall . . . develop a conceptual understanding of the site based on the evaluation of existing data . . ."). EPA interpretive guidance also recognizes the development of a "conceptual site model" as a critical part of the site investigative process. *See* U.S. EPA, *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA*, OSWER Dir. 9355.3-01 (Oct. 1988) ("*RI/FS Guidelines*"), at 2-3 to 2-7. The *RI/FS Guidelines* identify the development of a conceptual site model as a specific activity to be conducted in the project planning stage for the RI/FS. It is used to assess "both the nature and the extent of contamination and to identify potential exposure pathways and potential human health and/or environmental receptors." *Id.* at 2-3. The *RI/FS Guidelines* further identify the categories of information to be considered in developing the conceptual site model. The "conceptual site model should include known and suspected sources of contamination, types of contaminants and affected media, known and potential routes of migration, and known or potential human and environmental receptors." *Id.* at 2-7.

In applying the conceptual site model to the RI/FS process, EPA guidance clearly recognizes that the conceptual site model should be "carefully maintained and updated throughout the life of the site activities." *See* U.S. EPA, *Data Quality Objectives Process for Hazardous Waste Site Investigations*, EPA QA/G-4HW, EPA/600/R-00/007, January 2000, at

15 L (providing guidance on developing data quality objectives for environmental data collection in support of hazardous waste site investigations, including Superfund remedial investigations).

Regarding the process for developing and screening remedial action alternatives for the Feasibility Study ("FS"), EPA guidance states that "[s]ite characterization activities are typically continued throughout the . . . process," and that "[t]he need for additional data may be determined at any time and/or a number of times throughout the process." U.S. EPA, *The Feasibility Study: Development and Screening of Remedial Action Alternatives*, OSWER Dir. 9355.3-01FS3 (Nov. 1989).

b. <u>Remedy Selection Criteria</u>

The NCP identifies the criteria EPA must use in evaluating remedial alternatives for cleaning up a Superfund site consistent with CERCLA § 121 cleanup standards. *See* 40 C.F.R. § 300.430. For each remedial alternative being considered in the cleanup of a Superfund site, the NCP requires EPA to conduct a detailed analysis based on nine criteria. These criteria include two "threshold criteria," five "primary balancing criteria," and two "modifying criteria." 40 C.F.R. § 300.430(f)(1)(i)(A)-(C).

The two threshold criteria are (1) overall protection of human health and the environment; and (2) compliance with ARARs. *Id.* § 300.430(e)(9)(iii)(A)-(B). The first threshold criterion focuses on whether the proposed remedial alternative provides adequate protection to human health and the environment – assessing both long-term and short-term effectiveness. The second threshold criterion assesses whether the proposed remedial alternative is in compliance with specific federal and state environmental regulations, and includes consideration of chemical-specific, location-specific, and action-specific ARARs. If an ARAR cannot be met for any particular remedial alternative, EPA must consider whether a waiver of that particular requirement is appropriate. *See RI/FS Guidelines*, at 6-7 to 6-8.

The five primary balancing criteria are: (1) long-term effectiveness and permanence, which assesses the risk remaining at the site upon completion of a remedial action; (2) reduction of toxicity, mobility, or volume through treatment, and how such treatment will address the site's principal threats; (3) short-term effectiveness, which assesses the remedial alternative during the construction and implementation phase and considers factors such as environmental impact and protection of the community and workers during the remedial action; (4) implementability, which evaluates the technical and administrative feasibility of the remedial alternative; and (5) cost, which includes consideration of direct and indirect capital costs, annual operation and maintenance costs, and net present value of such costs. 40 C.F.R. §§ 300.430(e)(9)(iii)(C)-(G). Cost is a "central factor in all Superfund remedial selection decisions." *Id.* § 300.430(e)(9)(iii); *see also* U.S. EPA, *The Role of Cost in the Superfund Remedy Selection Process*, Pub. 9200.3-23FS (Sep. 1996), at 1.

The two modifying criteria are: (1) state acceptance, including consideration of a State's key issues and concerns, as well as state ARARs and use of waivers; and (2) community acceptance – taking into consideration community support and opposition to a proposed remedial alternative. 40 C.F.R. § 300.430(e)(9)(iii)(H)-(I).

EPA must follow specific procedures in applying these nine criteria. *See* U.S. EPA, *A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents*, OSWER Dir. 9200.1-23P (Jul. 1999) ("*Guide to Preparing Superfund Proposed Plans*"), at 1-5. As explained by the U.S. Court of Appeals for the D.C. Circuit:

> While the NCP identifies nine criteria to be used in selecting a remedy, all of the criteria are not given equal weight. Instead, they are divided into three classifications: threshold criteria, primary balancing criteria, and modifying criteria. Under this structure, "[o]verall protection of human health and the

> environment and compliance with ARARs (unless a specific ARAR is waived) are threshold requirements that each alternative must meet in order to be eligible for selection." 40 C.F.R. § 300.430(f)(1)(i)(A). EPA explained in the preamble to the NCP that remedial alternatives "must be demonstrated to be protective . . . in order to be eligible for consideration in the balancing process by which the remedy is selected." 55 Fed. Reg. 8726 (1990).

State of Ohio v. EPA, 997 F.2d 1520, 1531 (D.C. Cir. 1993).

Thus, a proposed remedial alternative is only eligible for consideration if it meets the two threshold criteria. 40 C.F.R. § 300.430(f)(1)(i)(A). Thereafter, EPA must use the five primary balancing criteria to evaluate each remedial alternative. *Id.* § 300.430(f)(1)(i)(B). EPA must select preferred remedial alternatives that satisfy the threshold criteria and provide the "best balance of trade-offs" with respect to the five primary balancing criteria. *Id.* § 300.430(f)(1)(ii)(E). The preferred remedial alternatives selected in the FS are to be based on EPA's assessment of these first seven criteria.[1]

Once the preferred remedial alternatives are selected for the site, EPA prepares and publishes a proposed plan for public and state consideration. *Id.* § 300.430(f)(2). If necessary, EPA can modify the plan based on the comments received from the state and the community, thereby applying the "state acceptance" and "community acceptance" modifying criteria. *Id.* § 300.430(f)(4). As EPA notes in its RI/FS Guidelines, "[m]odifying criteria, . . . may be considered to the extent that information is available during the FS, *but can be fully considered only after public comment is received on the Proposed Plan*. In the final balancing of trade-offs between alternatives upon which the final remedy selection is based, modifying criteria are of equal importance to the balancing criteria." *Guide to Preparing Superfund Proposed Plans*, at 3-7 (emphasis added).

3. Standard of Review

In the event of judicial review, a court will evaluate EPA's remedy selection process under the standard of judicial review set forth in CERCLA § 113(j), which provides that "judicial review of any issues concerning the adequacy of any response action taken or ordered by the [EPA] shall be limited to the administrative record." 42 U.S.C. § 9613(j)(1). CERCLA § 113(j)(2) further provides that, in considering objections, the court may reject the response action selected if "the objecting party can demonstrate, on the administrative record, that the decision was arbitrary and capricious or otherwise not in accordance with law." *Id.* § 9613(j)(2).

In assessing whether EPA's remedy selection process is arbitrary and capricious under CERCLA § 113(j), courts examine whether "[t]he agency has relied on factors which Congress has not intended it to consider, entirely failed to consider an important aspect of the problem, offered an explanation for its decision that runs counter to the evidence before the agency, or is so implausible that it would not be ascribed to a difference in view or the product of agency expertise." *United States v. Burlington N.R.R. Co.*, 200 F.3d 679, 689 (10th Cir. 1999).

Burlington Northern demonstrates the standard EPA must meet under § 113(j). In 1984, EPA placed a wood treatment facility owned and operated by Broderick Investment Company ("BIC") on the National Priorities List. *U.S. v. Burlington N. R.R. Co,* 200 F.3d 679, 682 (10th Cir 1999). The facility treated wood products with hazardous substances such as creosote and pentachlorophenol, and disposed of process waste in two unlined impoundments, which created sludge. *Id.* On June 30, 1988, EPA issued a Record of Decision ("ROD") for Operable Unit 1

[1] The RI is the key tool for initially collecting and characterizing the relevant site data, which can then be used to conduct a detailed analysis of proposed remedial alternatives in the FS, applying the threshold and primary balancing criteria consistent with the requirements of CERCLA and the NCP. *Id.* § 300.430(e).

("OU1"), which addressed treatment of impoundment sludge via on-site incineration. *Id.* EPA issued an amendment to the ROD for OU1 in 1991, which called for off-site reclamation of the sludge because incineration prices had increased and reclamation was an equally protective alternative. *Id.* Upon beginning to implement the ROD, Allied-Signal, the off-site sludge reclaimer, notified EPA that rocks in the sludge clogged the pumping equipment, adhered to the liners of the holding cells, and settled during transport to form "tar heels" in the rail cars used to transport the sludge. *Id.* As a result, Allied-Signal had to charge extra for installing a gravity settling box to pump sludge into the railcars, incinerating plastic liners and other miscellaneous materials in the holding tanks, and scraping and incinerating the "tar heels." *Id.* at 692. The added requirements increased the costs associated with the amended ROD for OU1 from $2.2 million to $3.5 million, or by approximately 60 percent. *Id.* Based on evidence in the administrative record cited by BIC, the court held that EPA's failure to make a second amendment to the ROD for OU1 was arbitrary and capricious because (1) it left PRPs like BIC out of the decision-making process, (2) it resulted in fundamentally altering the remedy with respect to scope and cost, and (3) the cleanup, as undertaken, conflicted with the amended ROD's provision rejecting off-site incineration of sludge, all inconsistent with the NCP. *Id.* at 694.

State of Minnesota v. Kalman W. Abrams Metals, Inc. is another case where a response action was held to be arbitrary and capricious under § 113(j)(2) because it was inconsistent with the NCP. *State of Minnesota v. Kalman W. Abrams Metals, Inc.*, 155 F.3d 1019, 1024-25 (8th Cir. 1998). The lead agency, the Minnesota Pollution Control Agency ("MPCA") issued a Request for Response Action ("RFRA") seeking to require a response action addressing lead-contaminated soil on Gerald McGuire's property, which was used for burning insulation of wire

from local scrap dealers, and re-selling the wire. When McGuire refused to comply, the MPCA responded to the contamination by hiring a contractor, Microbial Biotechnology, Inc. ("MBI"), to perform on-site lead extraction soil washing. *Id.* MBI could not successfully complete the soil washing procedure due to mechanical problems with equipment and soil conditions that were not conducive to soil washing. *Id.* After hiring two additional contractors, MPCA rejected the soil washing procedure and instead completed on-site stabilization of the soil followed by off-site disposal. *Id.*

In January 1996 the State of Minnesota commenced an action seeking cost recovery against the scrap dealers alleged to have been the source of the material processed on-site. *Id.* The defendants argued that MPCA's response action was arbitrary and capricious under § 113(j)(2) of CERCLA. The U.S. District Court for the District of Minnesota found that MPCA conducted the response action in an arbitrary and capricious manner because it: (1) failed to complete a feasibility study before selecting the soil washing remedy; (2) ignored an EPA contractor's warning that "soil washing was 'questionable' because it would not 'address total lead concentrations" and its recommendation that "complete removal of the contaminated material would be the most environmentally sound and cost-effective method at this site"; (3) provided minimal public notice of the proposed soil washing remedy; (4) contracted to implement the remedy before the public comment period ended; and (5) failed to effectively wash the soil. *Id.* The Eighth Circuit Court of Appeals affirmed the District Court for the stated reasons above and also because MPCA: (1) failed to verify MBI's financial stability; (2) failed to require MBI to post a performance bond; and (3) the remedy selected was high-risk and high-cost. *Id.*

B. Principles for Managing Contaminated Sediments

EPA issued its *Contaminated Sediment Remediation Guidance for Hazardous Waste Sites* to provide technical and policy guidance for federal and state project managers considering remedial response actions under CERCLA. *See* U.S. EPA, *Contaminated Sediment Remediation Guidance for Hazardous Waste Sites*, OSWER Dir. 9355.0-85 (Dec. 2005), Executive Summary ("*Contaminated Sediment Remediation Guidance*"). The emphasis of this guidance is on evaluating alternatives during the feasibility study and remedy selection stage. *See id.* at 1-2. As EPA points out, "many aspects of the cleanup process may be more complex at sediment sites versus sites with soil or ground water contamination alone," and a number of potentially complicating factors for addressing contaminated sediment sites are identified:

- sediment sites may have a large number of sources, some of which can be ongoing and difficult to control;
- the sediment environment is usually dynamic, and understanding the effect of natural forces and man-made (anthropogenic) events on sediment movement and stability as well as contaminant transport can be difficult;
- cleanup work in an aquatic environment is frequently difficult from an engineering perspective and may be more costly than other media;
- contamination is often diffuse and the sites are often large and diverse (*e.g.*, mixed use, numerous property owners);
- many sediment sites contain ecologically valuable resources or legislatively protected species or habitats;
- for large sites, a number of communities with differing views and opinions may be affected; and

- there may be significant injuries to trustee resources at sediment sites.

See id. at 1-3 to 1-4.

The *Contaminated Sediment Remediation Guidance* incorporates EPA's *Principles for Managing Contaminated Sediment Risks at Hazardous Waste Sites*, OSWER Dir. 9285.6-08 (Feb. 2002) ("*Principles for Managing Contaminated Sediment Risks*"), issued by the Office of Solid Waste and Emergency Response. *See Contaminated Sediment Remediation Guidance*, at 1-5. *Principles for Managing Contaminated Sediment Risks* outlines a framework for making risk management decisions concerning hazardous waste sites that have contaminated sediments. It presents an iterative approach to site evaluation to ensure that the site is fully understood before remedial decisions are made. *See Principles for Managing Contaminated Sediment Risks*, at 1. Specifically, the guidance in the *Principles for Managing Contaminated Sediment Risks* presents eleven risk management principles to be considered, the following eight of which predominate:

- develop and refine a conceptual site model that considers sediment stability;
- use an iterative approach in a risk-based framework;
- carefully evaluate the assumptions and uncertainties associated with site characterization data and site models;
- select site-specific, project-specific, and sediment-specific risk management approaches that will achieve risk-based goals;
- ensure that sediment cleanup levels are clearly tied to risk management goals;
- maximize the effectiveness of institutional controls and recognize their limitations;

- design remedies to minimize short-term risks while achieving long-term protection; and
- monitor during and after sediment remediation to assess and document remedy effectiveness.

Id. at 2-9. These principles are intended to be applied within the framework of EPA's existing statutory and regulatory requirements, including the NCP's nine remedy selection criteria (40 C.F.R. § 300.430). *See id.* at 1-2.

Moreover, the *Contaminated Sediment Remediation Guidance* instructs the remedy selection teams to refer to *OSRTI Sediment Team and NRRB [National Remedy Review Board] Coordination at Large Sediment Sites*, OSWER Dir. 9285.6-11 (Mar. 2004), to help ensure that the principles are appropriately considered before making site-specific risk management decisions. *Contaminated Sediment Remediation Guidance*, at 1-5.

C. Applicable or Relevant and Appropriate Requirements ("ARARs")

CERCLA § 121(d)(2) requires that the level of control for any contaminant that will remain on-Site after completion of the remedial action must meet ARARs established by federal environmental law and more stringent state laws. *See* 42 U.S.C. § 9621(d)(2); *see also* U.S. EPA, *CERCLA Compliance With Other Laws Manual: Interim Final* (Aug. 1988) ("*CERCLA Compliance With Other Laws Manual*"), at 1-2. EPA may obtain a waiver of an ARAR if, *inter alia*, (1) compliance with an ARAR will result in greater risk to human health and the environment; (2) compliance with an ARAR is technically impracticable; (3) the selected remedy will attain an equivalent standard of performance; or (4) a state has not consistently applied the ARAR. *See* 42 U.S.C. § 9621(d)(4); *see also CERCLA Compliance With Other Laws Manual*, at 1-71 to 1-75.

Requirements are "applicable" if they "specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance found at a CERCLA site." 40 C.F.R. § 300.5. In order for a requirement to be applicable, "the remedial action or the circumstances at the site [should] satisfy *all* of the jurisdictional prerequisites of a requirement." *CERCLA Compliance With Other Laws Manual*, at 1-10 (emphasis added). Requirements that are not applicable may be "relevant and appropriate" if they "address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well suited to the particular site." *See* 40 C.F.R. § 300.5. A determination must be made that the requirement is both relevant *and* appropriate based on the evaluation of site-specific factors. *See CERCLA Compliance With Other Laws Manual*, at 1-10.

1. Resource Conservation and Recovery Act ("RCRA")

a. Definition of Hazardous Waste and the Contained-In Policy

RCRA regulates the identification and management of hazardous waste. *See* 42 U.S.C. § 6902. RCRA is potentially applicable to remedies at sites that involve the cleanup of material identified as RCRA hazardous waste. Before a material can be identified as a RCRA hazardous waste, however, it must first be classified as a solid waste. EPA's RCRA regulations set forth the scope of what is considered solid waste, which generally includes any material that is discarded, disposed, abandoned, or recycled in a way that is inherently "waste-like." 40 C.F.R. § 261.2.

Pursuant to EPA's "contained-in policy," environmental media (including soil and sediment) are not "solid waste" and therefore, cannot themselves be hazardous waste.[2]

[2] As discussed in the LDR Phase IV Final Rule, "[u]nder the 'contained-in' policy, EPA requires that soil (and other environmental media), *although not wastes themselves*, be managed as if they were hazardous waste if they contain hazardous waste or exhibit the characteristic of hazardous waste." *See* 63 Fed. Reg. 28,556, 28,621 (May 26, 1998);

Moreover, contaminated environmental media are not subject to regulation under RCRA unless they "contain" hazardous waste. U.S. EPA, *Management of Remediation Waste Under RCRA* (Oct. 1998), at 9. EPA guidance provides that contaminated environmental media contain hazardous waste: "(1) when they exhibit a characteristic of hazardous waste; or (2) when they are contaminated with concentrations of hazardous constituents from listed hazardous waste that are above-health-based levels." *Id.* If contaminated environmental media contain hazardous waste, they are subject to all applicable RCRA requirements until they no longer contain hazardous waste. Contaminated environmental media no longer contain hazardous waste: "(1) when they no longer exhibit a characteristic of hazardous waste; and (2) when concentrations of hazardous constituents from listed hazardous wastes are below health-based levels." *Id.* at 9-10.

b. <u>Land Disposal Restrictions</u>

Congress created EPA's Land Disposal Restrictions ("LDR") program under authority provided through enactment of the Hazardous and Solid Waste Amendments of 1984 ("HSWA"). The implementing regulations are found at 40 C.F.R. Part 268. The LDR program is intended to ensure that toxic constituents present in hazardous waste are properly treated before hazardous waste is land disposed.

As part of its implementation of the LDR program, EPA has developed mandatory technology-based treatment standards that must be met before hazardous waste is placed in a landfill. Wastes that do not meet treatment standards cannot be land disposed unless EPA has

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see also Letter from U.S. EPA to Thomas C. Jorling, Commissioner, Department of Environmental Conservation, State of New York (Jun. 19, 1989) (PPC 9441.1989(30)) ("Under our regulations, *contaminated media are not considered solid waste* in the sense of being abandoned, recycled, or inherently waste-like as those terms are defined in the regulations.") (emphasis added); Letter from U.S. EPA to John E. Ely, Enforcement Director, Virginia Department of Waste Management (Mar. 26, 1991) (PPC 9441.1991(04)) ("Our federal regulations at 40 C.F.R. Part 261.3 identify hazardous wastes. Among other things, these regulations state that a solid waste mixed with a hazardous waste is a hazardous waste. However, these regulations generally do not specifically address environmental media, *which are not solid wastes*, mixed with listed hazardous waste.") (emphasis added).

granted a variance, extension, or exclusion, or the waste is managed pursuant to an approved "no migration" petition. Solvents and dioxin-containing wastes both are subject to established treatment standards.

(i) Alternative Treatment Standards for Contaminated Soil

Remediation of hazardous waste sites will often produce contaminated soil that the generator must handle as hazardous waste because it contains a listed hazardous waste or it exhibits a characteristic of hazardous waste. These remediation wastes, due to either their large volume or unique properties, are not always amenable to the applicable treatment standards. Because of this, EPA designated soil as a unique treatability group and promulgated alternative soil-specific treatment standards in the Phase IV Final Rule (63 Fed. Reg. 28,556; May 26, 1998). As with hazardous waste, RCRA prohibits the land disposal of hazardous soil until the soil has been treated to meet LDR standards. The soil standards mandate reduction of hazardous constituents by 90 percent, capped at 10 times the universal treatment standard ("UTS").

As provided in the FS Addendum, EPA has chosen to apply the alternative treatment standards for soil to dewatered sediment for off-site disposal options under the sediment alternatives.

(ii) Variance from a Treatment Standard

With the establishment of soil-specific standards, EPA promulgated an additional provision in 40 C.F.R. § 268.44 for contaminated soil. Pursuant to § 268.44(h)(3), variances from otherwise applicable LDR treatment standards may be approved if it is determined that compliance with the treatment standard would result in treatment beyond the point at which short- and long-term threats to human health and the environment are minimized. This allows a site-specific, risk-based determination to supersede the technology-based LDR treatment standards under certain circumstances, allowing regulators to align cleanup levels and treatment

levels. Alternative LDR treatment standards established through site-specific risk-based variances are required to be within the range of values the Agency generally finds acceptable for risk-based cleanup levels. Decisions to grant or deny these variances are made by EPA Regions or authorized States.

(iii) Dioxin-Containing Waste

EPA has determined that incineration is the Best Demonstrated Available Technology ("BDAT") for the treatment of dioxin-containing restricted RCRA hazardous waste. *See* 40 C.F.R. § 268.40. While any technology short of dilution is permissible for achieving the required contaminant levels, only incineration has been able to achieve them.

c. Applicability of "F" Waste Code

Solid waste is considered to be hazardous if it is a material listed by regulation under one of four waste codes (F, K, P and U), or is a material exhibiting any of the following characteristics: (1) ignitability, (2) corrosivity, (3) reactivity, or (4) Extraction Procedure ("EP") Toxicity. 40 C.F.R. § 261.11. The F code listings represent hazardous wastes from "non-specific sources," and include waste material from industrial and manufacturing processes. *See* 40 C.F.R. § 261.31. The F020 code, which is at issue at the Site, is applied to wastes "from the production or manufacturing use . . . of tri- or tetrachlorophenol, or of intermediates used to produce their pesticide derivatives. (This listing does not include wastes from the production of Hexachlorophene from highly purified 2,4,5-trichlorophenol.)." 40 C.F.R. § 261.31.

EPA policy states that "[s]ite managers are not required to presume that a CERCLA hazardous substance is a RCRA hazardous waste unless there is affirmative evidence to support such a finding." U.S. EPA, *Determining When Land Disposal Restrictions (LDRs) Are Applicable to CERCLA Response Actions*, OSWER Dir. 9347.3-05FS (Jul. 1989), at 2. Moreover, "[w]here a facility owner/operator makes a good faith effort to determine if a material

is a listed hazardous waste but cannot make such a determination because documentation regarding a source of contamination, contaminant, or waste is unavailable or inconclusive . . . one may assume the source, contaminant or waste is not listed hazardous waste . . . ." *Management of Remediation Waste Under RCRA*, at 5. Therefore, provided the material in question does not exhibit a characteristic of hazardous waste, RCRA requirements do not apply. *See id.*

EPA has discussed this approach in a number of contexts. In the preamble of the proposed NCP, EPA noted that it is often necessary to know the source of a waste to determine whether it is a RCRA listed hazardous waste and that "at many CERCLA sites no information exists on the source of the wastes." 53 Fed. Reg. 51,394, 51,444 (Dec. 21, 1988). EPA recommended that available site information, such as manifests, storage records and vouchers, be used to ascertain the sources of wastes, but when this documentation is not available or inconclusive, it may be assumed that the wastes are not listed wastes. *Id.* EPA confirmed this approach in the preamble to the final NCP. *See* 55 Fed. Reg. 8,666, 8,758 (Mar. 8, 1990); *see also Management of Remediation Waste Under RCRA*, at 4-5.

In the HWIR-Media proposed rule, 61 Fed. Reg. 18,780 (Apr. 29, 1996), EPA expanded the policy to also cover dates of waste disposal – if, after a good faith effort to determine dates of disposal, a facility owner/operator is unable to make such a determination because documentation of dates of disposal is unavailable or inconclusive, one may assume disposal occurred prior to the effective date of applicable LDRs. *Id.* at 18,805. EPA concluded that "if information is not available or inconclusive, facility owner/operators may generally assume that the material contaminating the media were not hazardous wastes." *Id.*

The LDR Phase IV Final Rule, 63 Fed. Reg. 28,556 (May 26, 1998), supports this interpretation and provides guidance on the type of assessment needed to determine the source of waste. EPA reiterated that "if information is not available or inconclusive, it is generally reasonable to assume that contaminated soils do not contain untreated hazardous waste placed after the effective dates of applicable land disposal prohibitions." *Id.* at 28,619. Further, "program implementers and facility owners/operators cannot make the determination that information on the types of waste contamination or dates or placement is unavailable or inconclusive without first making a good faith effort to uncover such information." *Id.*

d. <u>Applicability of RCRA and the LDRs to In-Place Contaminated Soil</u>

In-place contaminated environmental media are not subject to RCRA LDR regulations, because the LDRs do not apply to *in-situ* contaminated soil. This is consistent with the EPA policy that "[i]n order for something to be classified as a hazardous waste *it must first be a solid waste*. In-place media *does not meet the definition of solid waste*. That's where it is supposed to be. It's not discarded." U.S. EPA, Training Curriculum: Session 10, RCRA Hazardous Waste Identification: Special Regulatory Conventions (emphasis in original).

EPA explicitly states in its 1998 Phase IV LDR rulemaking that the LDRs do not apply to *in-situ* contaminated soils:

> Land disposal restrictions only attach to prohibited hazardous waste (or hazardous contaminated soil) when it is (1) generated and (2) placed in a land disposal unit [footnote omitted]. Therefore, if contaminated soil is not removed from the land (i.e., generated), LDRs cannot apply. Similarly, if contaminated soil is removed from the land (i.e., generated) yet never placed in a land disposal unit, LDRs cannot apply.[43] In other words, *LDRs do not apply to contaminated soil in situ or force excavation of contaminated soil*. If soils are excavated, however, LDRs may apply, as discussed below.

63 Fed. Reg. at 28,617 (emphasis added).

Footnote 43 in the quoted text discusses EPA's area of contamination policy:

> Note that, as discussed later in today's preamble, nothing in today's final rule affects implementation of the existing "area of contamination" policy. Therefore, soil managed within areas of contamination, even if it is "removed from the land" within such an area, would not be considered to be "generated."

Id. at 28,617 n. 43.

In publishing the HWIR-Media proposed rules, EPA made clear that the contaminated media rules apply only after a decision has been reached under other rules and guidance to remove contaminated media and manage them other than *in-situ*:

> EPA wishes to emphasize that the proposed HWIR-media rules would not affect which media or wastes at a site must be cleaned up, or how much contaminated media should be excavated. Such decisions are usually made according to federal or state cleanup laws and regulations, most of which specify certain guidelines or criteria for determining how sites are to be cleaned up. Only after those decisions are made would these HWIR-media regulations come into play.

61 Fed. Reg. at 18,789.

Capping wastes in-place does not constitute a placement/land disposal management practice for purposes of the LDRs. *See* U.S. EPA, *Superfund Management of Investigation-Derived Wastes During Site Inspections,* OSWER Dir. 9345.3-02 (May 1991). When managed *in-situ*, environmental media not removed from the area of contamination do not trigger the LDRs:

> In the area of contamination policy, EPA interprets RCRA to allow certain discrete areas of generally dispersed contamination to be considered a RCRA unit (usually a landfill). 55 FR 8758-8760 (March 8, 1999). *This interpretation allows hazardous wastes (and hazardous contaminated soils) to be consolidated, treated in situ or left in place within an area of contamination* without triggering the RCRA land disposal restrictions or minimum technology requirements – since such activities would not involve "placement into a land disposal unit," which is the statutory trigger for LDR. EPA clarifies that its interpretation of LDR applicability for contaminated soil does not, in any way, affect implementation of the area of contamination policy.

63 Fed. Reg. at 28,620 (emphasis added).

2. Toxic Substances Control Act ("TSCA")

Pursuant to TSCA, EPA has promulgated regulations to address the cleanup and disposal of PCB remediation waste. *See* 40 C.F.R. Part 761, Subpart F. "PCB remediation waste" includes "waste containing PCBs as a result of a spill, release, or other unauthorized disposal . . . prior to April 18, 1978, that are currently at concentrations > 50 parts per million ("ppm") PCB, regardless of the concentrations of the original spill." 40 C.F.R. § 761.3. Bulk PCB remediation waste (*e.g.*, soils and sediments) with concentrations less than or equal to 100 ppm may remain in-place in low occupancy areas if the area is capped. *Id.* § 761.61(a)(4)(i)(B)(3). The cap must be of sufficient thickness to "prevent or minimize human exposure, infiltration of water, and erosion" and be subject to appropriate institutional controls. *Id.* § 761.61(a)(7)-(8).

3. Preliminary Remediation Goals ("PRGs") for Dioxins in Soils

The current PRG for dioxin in residential soil is 1 ug/kg. In May 2009, EPA issued a "Science Plan for Activities Related to Dioxins in the Environment" detailing a plan, with interim milestones, for completion of the Agency's reassessment of the health risks of exposure to dioxin, entitled "Exposure and Human Health Reassessment of 2,3,7,8-Tetrachlorodibenzo-p-Dioxin ("TCDD") and Related Compounds" and commonly known as the "dioxin reassessment." One of the plan's interim milestones is the issuance of updated interim PRGs for dioxins and dioxin-like compounds (including certain PCBs) in soils. In late December 2009, EPA issued its draft updated interim PRGs. The draft interim PRGs proposed by EPA are more stringent than the existing ones, and would reduce the PRGs for soil in industrial and commercial areas from between 5,000 and 20,000 parts per trillion ("ppt") to 950 ppt, and the PRGs for soil in residential areas from 1,000 ppt to 72 ppt. U.S. EPA, *Public Review Draft, Draft Recommended Interim Preliminary Remediation Goals for Dioxin in Soil at CERCLA and RCRA Sites*, OSWER Dir. 9200.3-56 (Dec. 30, 2009)("*Public Review Draft*"), at 13. Notice of the draft interim PRGs

was published in the Federal Register on January 7, 2010, *see* 75 Fed. Reg. 984 (Jan. 7, 2010), and EPA has not yet finalized the interim PRGs.

EPA's *Public Review Draft* expressly states that: "the findings and conclusions in this document are for public review and should not be construed to represent any final agency determination or policy" (document footer). Moreover, EPA states that: "[u]ntil these draft recommended interim PRGs are finalized, EPA will continue to use the 1998 recommended interim PRGs (EPA 1998)." *Id.* at 2.

4. Executive Orders

EPA does not consider Executive Orders to be ARARs; instead, they are "to-be-considered" materials ("TBCs"). U.S. EPA, *Considering Wetlands at CERCLA Sites*, Pub. 9280.0-03 (May 1994), at 11-12. In its guidance, EPA states that TBCs "are meant to complement the use of ARARs, not to compete with or replace them. TBCs are not legally enforceable and therefore are not ARARs. Their identification and use are not mandatory." *Id.* at 11. EPA also states that Executive Orders "differ from other TBCs in that they are orders of the President to all Executive Branch employees, so that even though they are not ARARs under CERCLA they *should* be complied with." *Id.* at 12 (emphasis added).

5. State ARARs

On-site remedial actions must attain promulgated state environmental and facility siting requirements that are more stringent than federal ARARs, if the state requirement is identified in a "timely" manner. *See* 42 U.S.C. § 9621(d)(2); *see also* U.S. EPA, *CERCLA Compliance With Other Laws Manual: Part II. Clean Air Act and Other Environmental Statutes and State Requirements*, OSWER Dir. 9234.1-02 (Aug. 1989) ("*CERCLA Compliance With Other Laws Manual: Part II*"), at 7-1. Potential state ARARs include requirements regarding the siting of waste treatment, storage and disposal facilities; control of discharges to surface waters; and

preventing further degradation of surface waters and groundwater. *CERCLA Compliance With Other Laws Manual: Part II*, at 7-10, 7-26 to 7-27, 7-28, 7-30. A state ARAR may be waived if the state has inconsistently applied the standard at cleanup sites within the state. *See* 42 U.S.C. § 9621(d)(4)(E).

Chemical-specific state ARARs identified by EPA for the Site include the State of Rhode Island and Providence Plantations, Department of Environmental Management, Office of Waste Management, *Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases, Short Title: Remediation Regulations* (DEM-DSR-01-93) ("Remediation Regulations"). In accordance with Rule 8.02 of the Remediation Regulations, unless otherwise specified, "soil contaminated as a result of a release of hazardous materials shall be remediated in a manner which meets the direct exposure and leachability criteria for each hazardous substance established in Rule 8.02.B (Method 1 Soil Objectives: Tables 1 and 2), Rule 8.02.C (Method 2 Soil Objectives) or Rule 8.04 (Method 3 Remedial Objectives); or the background concentration of the hazardous substance as established by Rule 8.06 (Background Concentrations for Soils)."

Soil at the Site has been determined to contain contaminants subject to the Rule 8.02.B soil objectives. In accordance with Rule 8.03 of the Remediation Regulations, "groundwater contaminated as a result of a release of hazardous materials located in a GB area shall be remediated to a concentration which meets the groundwater objective for each hazardous substance established in Rule 8.03.B.ii (Method 1 GB Groundwater Objectives) and specified in Table 4, Rule 8.03.C (Method 2 GB Groundwater Objectives) or Rule 8.04 (Method 3 Remedial Objectives); or the background concentration of the hazardous substance." Groundwater at the

Site has been determined to contain contaminants subject to the Rule 8.03 GB groundwater objectives.

Action-specific state ARARs identified by EPA for the Site include RIDEM Rules and Regulations for Hazardous Waste Management (Amendment Eff. Feb. 9, 2007) ("Hazardous Waste Regulations"). Rhode Island has been delegated authority to administer the federal RCRA statute through its regulations. The standards set forth in 40 C.F.R. Part 261 are incorporated into the state requirements by reference. The Hazardous Waste Regulations set forth requirements for hazardous waste determination according to federal (40 C.F.R. § 262.11) and state (Rule 5.08) definitions. As provided in Table 3-1 of the FS Report, "[s]olid waste generated by excavation of soils or sediments at the Site is required to undergo hazardous waste determination." EPA takes the position, as presented in Table 3-1 of the FS Report, that the RIDEM standard is "*relevant and appropriate* because wastes that may be classified as hazardous waste were disposed of prior to 1980."

D. Information Quality Act ("IQA")

The IQA, Section 515(a) of the Treasury and General Government Appropriations Act for Fiscal Year 2001 (Public Law 106-554; H.R. 5658), was passed in 2000 as a rider to an omnibus budget package. The IQA directs the Office of Management and Budget ("OMB") to develop guidelines to "ensur[e] and maximize[e] the quality, objectivity, utility, and integrity of information" disseminated by federal agencies "in fulfillment of the purposes [of] the Paperwork Reduction Act." *Id.*

In 2002, OMB issued *Guidelines for Ensuring and Maximizing the Quality, Objectivity, Utility, and Integrity of Information Disseminated by Federal Agencies* ("*OMB Guidelines*"). 67 Fed. Reg. 8452 (Feb. 22, 2002). Pursuant to the OMB Guidelines, EPA issued its *Guidelines for*

Ensuring and Maximizing the Quality, Objectivity, Utility, and Integrity of Information Disseminated by the Environmental Protection Agency in October 2002 ("*EPA Guidelines*").

Information and data disseminated by EPA must meet OMB and EPA standards for "objectivity," "integrity," and "utility." *EPA Guidelines*, at 3. According to the *EPA Guidelines*:

> "Objectivity" focuses on whether the disseminated information is being presented in an accurate, clear, complete, and unbiased manner, and as a matter of substance, is accurate, reliable, and unbiased. "Integrity" refers to security, such as the protection of information from unauthorized access or revision, to ensure that the information is not compromised through corruption or falsification. "Utility" refers to the usefulness of the information to the intended users.

EPA Guidelines, at 15.

REPOSITORY TARGET SHEET

US EPA New England
Superfund Document Management System /
RCRA Document Management System
Native Files Target Sheet

SDMS Document ID #: 506583

Site Name: Centredale Manor Restoration Project

File Type(s) Attached (examples: Excel file or .jpg):

.PDF

Document Type this Target Sheet Represents:

[ ] Map [ ] Photograph [ ] Graph/Chart

[ ] Video [ ] Compact Disc [X] Other (Specify below)

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