Support Document for the Revised National Priorities List Final Rule - June 2001

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ABSTRACT

Pursuant to Section 105(a)(8)(B) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), the U.S. Environmental Protection Agency (EPA) periodically adds hazardous waste sites to the National Priorities List (NPL). Prior to actually listing a site, EPA proposes the site in the *Federal Register* and solicits public comments.

This document provides responses to public comments received on one site proposed on May 11, 2000 (65 FR 30489), two sites proposed on July 27, 2000 (65 FR 46131), one site proposed on August 24, 2000 (65 FR 51567), and three sites proposed on December 1, 2000 (65 FR 75215. All of the sites are added to the NPL based on an evaluation under the HRS. These sites are being added to the NPL in a final rule published in the *Federal Register* in June 2001.

CONTENTS

Executive Summary v

Introduction vii
Background of the NPL vii
Development of the NPL viii
Hazard Ranking System ix
Other Mechanisms for Listing x
Organization of this Document x
Glossary xi

Region 1
Section 1.1: Elizabeth Mine 1.1-1
Section 1.2: Nuclear Metals, Inc. 1.2-1
Section 1.3: Sutton Brook Disposal Area 1.3-1

Region 2
Section 2.1: Consolidated Iron and Metal 2.1-1

Region 3
Section 3.1: Lower Darby Creek Area 3.1-1

Region 6
Section 4.1: Malone Service Co., Inc. 4.1-1

Region 10
Section 5.1: Taylor Lumber and Treating 5.1-1

EXECUTIVE SUMMARY

Section 105(a)(8)(B) of CERCLA, as amended by SARA, requires that the EPA prepare a list of national priorities among the known releases or threatened releases of hazardous substances, pollutants, or contaminants throughout the United States. An original NPL was promulgated on September 8, 1983 (48 FR 40658). CERCLA also requires the EPA to update the list at least annually.

This document provides responses to public comments received on one site proposed on May 11, 2000 (65 FR 30489), two sites proposed on July 27, 2000 (65 FR 46131), one site proposed on August 24, 2000 (65 FR 51567), and three sites proposed on December 1, 2000 (65 FR 75215. All of the sites are added to the NPL based on an evaluation under the HRS. These sites are being added to the NPL in a final rule published in the *Federal Register* in June 2001.

The seven sites addressed in this document are listed in the following table.

SITES ADDRESSED IN THIS DOCUMENT

					HRS Score	
Region	**State**	**Site Name**	**City**	**Proposal Date**	**Proposed**	**Final**
1	VT	Elizabeth Mine	Stafford	December 1, 2000	50.00	50.00
1	MA	Nuclear Metals, Inc.	Concord	July 27, 2000	58.31	58.31
1	MA	Sutton Brook Disposal Area	Tewksbury	July 27, 2000	57.12	57.12
2	NY	Consolidated Iron and Metal	Newburgh	December 1, 2000	50.00	50.00
3	PA	Lower Darby Creek Area	Delaware and Philadelphia Counties	May 11, 2000	50.00	50.00
6	TX	Malone Service Co., Inc.	Texas City	August 24, 2000	50.00	50.00
10	OR	Taylor Lumber and Treating	Sheridan	December 1, 2000	71.78	71.78

INTRODUCTION

This document explains the rationale for adding seven sites to the NPL of uncontrolled hazardous waste sites and also provides the responses to public comments received on the sites. The EPA proposed one site proposed on May 11, 2000 (65 FR 30489), two sites proposed on July 27, 2000 (65 FR 46131), one site proposed on August 24, 2000 (65 FR 51567), and three sites proposed on December 1, 2000 (65 FR 75215). All of the sites are added to the NPL based on an evaluation under the HRS. These sites are being added to the NPL in a final rule published in the *Federal Register* in June 2001.

Background of the NPL

In 1980, Congress enacted CERCLA, 42 U.S.C. Sections 9601 *et seq*. in response to the dangers of uncontrolled hazardous waste sites. CERCLA was amended on October 17, 1986, by SARA, Public Law No. 99-499, stat., 1613 *et seq*. To implement CERCLA, EPA promulgated the revised National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR Part 300, on July 16, 1982 (47 FR 31180), pursuant to CERCLA Section 105 and Executive Order 12316 (46 FR 42237, August 20, 1981). The NCP, further revised by EPA on September 16, 1985 (50 FR 37624) and November 20, 1985 (50 FR 47912), sets forth guidelines and procedures needed to respond under CERCLA to releases and threatened releases of hazardous substances, pollutants, or contaminants. On March 8, 1990 (55 FR 8666), EPA further revised the NCP in response to SARA.

Section 105(a)(8)(A) of CERCLA, as amended by SARA, requires that the NCP include

> criteria for determining priorities among releases or threatened releases throughout the United States for the purpose of taking remedial action and, to the extent practicable, take into account the potential urgency of such action, for the purpose of taking removal action.

Removal action involves cleanup or other actions that are taken in response to emergency conditions or on a short-term or temporary basis (CERCLA Section 101(23)). Remedial action tends to be long-term in nature and involves response actions that are consistent with a permanent remedy for a release (CERCLA Section 101(24)). Criteria for placing sites on the NPL, which makes them eligible for remedial actions financed by the Trust Fund established under CERCLA, were included in the HRS, which EPA promulgated as Appendix A of the NCP (47 FR 31219, July 16, 1982). On December 14, 1990 (56 FR 51532), EPA promulgated revisions to the HRS in response to SARA, and established the effective date for the HRS revisions as March 15, 1991.

Section 105(a)(8)(B) of CERCLA, as amended, requires that the statutory criteria provided by the HRS be used to prepare a list of national priorities among the known releases or threatened releases of hazardous substances, pollutants, or contaminants throughout the United States. The list, which is Appendix B of the NCP, is the NPL.

An original NPL of 406 sites was promulgated on September 8, 1983 (48 FR 40658). At that time, an HRS score of 28.5 was established as the cutoff for listing because it yielded an initial NPL of at least 400 sites, as suggested by CERCLA. The NPL has been expanded several times since then, most recently on December 11, 2000 (65 FR 75179). The Agency also has published a number of proposed rulemakings to add sites to the NPL. The most recent proposal was on January 11, 2001 (66 FR 2380).

Development of the NPL

The primary purpose of the NPL is stated in the legislative history of CERCLA (Report of the Committee on Environment and Public Works, Senate Report No. 96-848, 96th Cong., 2d Sess. 60 [1980]):

> The priority list serves primarily informational purposes, identifying for the States and the public those facilities and sites or other releases which appear to warrant remedial actions. Inclusion of a facility or site on the list does not in itself reflect a judgment of the activities of its owner or operator, it does not require those persons to undertake any action, nor does it assign liability to any person. Subsequent government actions will be necessary in order to do so, and these actions will be attended by all appropriate procedural safeguards.

The purpose of the NPL, therefore, is primarily to serve as an informational and management tool. The identification of a site for the NPL is intended primarily to guide EPA in determining which sites warrant further investigation to assess the nature and extent of the human health and environmental risks associated with the site and to determine what CERCLA-financed remedial action(s), if any, may be appropriate. The NPL also serves to notify the public of sites EPA believes warrant further investigation. Finally, listing a site may, to the extent potentially responsible parties are identifiable at the time of listing, serve as notice to such parties that the Agency may initiate CERCLA-financed remedial action.

CERCLA Section 105(a)(8)(B) directs EPA to list priority sites among the known releases or threatened release of hazardous substances, pollutants, or contaminants, and Section 105(a)(8)(A) directs EPA to consider certain enumerated and other appropriate factors in doing so. Thus, as a matter of policy, EPA has the discretion not to use CERCLA to respond to certain types of releases. Where other authorities exist, placing sites on the NPL for possible remedial action under CERCLA may not be appropriate. Therefore, EPA has chosen not to place certain types of sites on the NPL even though CERCLA does not exclude such action. If, however, the Agency later determines that sites not listed as a matter of policy are not being properly responded to, the Agency may consider placing them on the NPL.

Hazard Ranking System

The HRS is the principal mechanism EPA uses to place uncontrolled waste sites on the NPL. It is a numerically based screening system that uses information from initial, limited investigations -- the preliminary assessment and site inspection -- to assess the relative potential of sites to pose a threat to human health or the environment. HRS scores, however, do not determine the sequence in which EPA funds remedial response actions, because the information collected to develop HRS scores is not sufficient in itself to determine either the extent of contamination or the appropriate response for a particular site. Moreover, the sites with the highest scores do not necessarily come to the Agency's attention first, so that addressing sites strictly on the basis of ranking would in some cases require stopping work at sites where it was already underway. Thus, EPA relies on further, more detailed studies in the remedial investigation/feasibility study that typically follows listing.

The HRS uses a structured value analysis approach to scoring sites. This approach assigns numerical values to factors, that relate to or indicate risk, based on conditions at the site. The factors are grouped into three categories. Each category has a maximum value. The categories include:

- likelihood that a site has released or has the potential to release hazardous substances into the environment;
- characteristics of the waste (toxicity and waste quantity); and
- people or sensitive environments (targets) affected by the release.

Under the HRS, four pathways can be scored for one or more threats:

- Ground Water Migration (S_{gw})
  - drinking water
- Surface Water Migration (S_{sw})
  These threats are evaluated for two separate migration components (overland/flood and ground water to surface water).
  - drinking water
  - human food chain
  - sensitive environments
- Soil Exposure (S_s)
  - resident population
  - nearby population
  - sensitive environments
- Air Migration (S_a)
  - population
  - sensitive environments

After scores are calculated for one or more pathways according to prescribed guidelines, they are combined using the following root-mean-square equation to determine the overall site score (S), which ranges from 0 to 100:

$$S = \sqrt{\frac{S_{gw}^2 + S_{sw}^2 + S_s^2 + S_a^2}{4}}$$

If all pathway scores are low, the HRS score is low. However, the HRS score can be relatively high even if only one pathway score is high. This is an important requirement for HRS scoring because some extremely dangerous sites pose threats through only one pathway. For example, buried leaking drums of hazardous substances can contaminate drinking water wells, but -- if the drums are buried deep enough and the substances not very volatile -- not surface water or air.

Other Mechanisms for Listing

Aside from the HRS, there are two other mechanisms by which sites can be placed on the NPL. The first of these mechanisms, authorized by the NCP at 40 CFR 300.425(c)(2), allows each State and Territory to designate one site as its highest priority regardless of score.

The last mechanism, authorized by the NCP at 40 CFR 300.425(c)(3), allows listing a site if it meets all three of these requirements:

- Agency for Toxic Substances and Disease Registry (ATSDR) of the U.S. Public Health Service has issued a health advisory that recommends dissociation of individuals from the release;
- EPA determines the site poses a significant threat to public health; and
- EPA anticipates it will be more cost-effective to use its remedial authority than to use its emergency removal authority to respond to the site.

Organization of this Document

Each section that follows addresses site-specific public comments. The sites are arranged by EPA Region and are listed alphabetically by state and site name. Each site discussion begins with a list of commenters, followed by a site description, a summary of comments, and Agency responses. A concluding statement indicates the effect of the comments on the HRS score for the site.

Glossary

The following acronyms and abbreviations are used throughout the text:

Agency	U.S. Environmental Protection Agency
ATSDR	Agency for Toxic Substances and Disease Registry
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 U.S.C. Sections 9601 *et seq.*, also known as Superfund
EPA	U.S. Environmental Protection Agency
HRS	Hazard Ranking System, Appendix A of the National Oil and Hazardous Substances Pollution Contingency Plan, 40 C.F.R. Part 300
HRS Score	Overall site score calculated using the Hazard Ranking System; ranges from 0 to 100
NCP	National Oil and Hazardous Substances Pollution Contingency Plan, 40 C.F.R. Part 300
NPL	National Priorities List, Appendix B of the NCP
NPL-###	Public comment index numbers as recorded in the Superfund Docket in EPA Headquarters and in Regional offices
PA/SI	Preliminary Assessment/Site Inspection
PRP	Potentially Responsible Party
RCRA	Resource Conservation and Recovery Act of 1976 (U.S.C. 9601-6991, as amended)
RD/RA	Remedial Design/Remedial Action
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision, explaining the CERCLA-funded cleanup alternative(s) to be used at an NPL site
SARA	Superfund Amendments and Reauthorization Act of 1986, Public Law No. 99-499, stat., 1613 *et seq.*

REGION 1

1.1 ELIZABETH MINE, STAFFORD, VERMONT

1.1.1 List of Commenters and Correspondents

NPL-U34-3-2-1-R2	Comment dated January 24, 2001 from John Freitag, chair, Citizens for a Sensible Solution. South Strafford, Vermont
NPL-U34-5-2-R2	Correspondence dated September 15, 2000 from the Honorable Howard Dean, M.D., Governor of Vermont

1.1.2 Site Description

The Elizabeth Mine is an abandoned mine in the village of South Strafford, Orange County, Vermont. The ore was mined for iron, pyrrhotite (precursor of iron sulfate) and chalcopyrite (copper). The mine operated from the early 1800s until its closure in 1958. Past operations at the mine consisted of mining, copper smelting, and ore processing. Sources evaluated for the purpose of scoring include three tailings piles covering about 40 acres, and flows from a mining shaft. Observed releases to surface water by direct observation and by chemical analysis have been documented for several metals, including copper, zinc and selenium, all of which bioaccumulate in aquatic organisms. In addition, acid mine drainage has been observed discharging from the mine shaft. The contamination is in both drainages for the mine. One drainage, Copperas Brook, flows through the mine tailings. The other is unnamed but flows into the West Branch of the Ompompanoosuc River. Both water bodies are in the same watershed.

According to a 1998 State of Vermont assessment report, the West Branch of the Ompompanoosuc River from the confluence with Copperas Brook to the Ompompanoosuc River did not support aquatic biota due to the metals in sediments and acidic conditions from the mine tailings, although the U.S. Army Corps of Engineers (USACE) has identified fish species present in this reach. In addition, there are 1.5 miles of wetland frontage, and habitats of one state and federally endangered species and one state threatened species threatened by the site releases.

1.1.3 Summary of Comments/Correspondence

Howard Dean, M.D., Governor of Vermont expressed Vermont's support for the placement of the Elizabeth Mine site on the NPL.

John Freitag, chair, Citizens for a Sensible Solution (the "Group") stated that the Group supported the site listing and remediation, but that "we are concerned with what we feel is an exaggerated statement of the size and scope of the problem which may lead to an unnecessary drastic response," and that "[o]ur concern is that if we do not accurately portray the problem we will not achieve the best solution." He

noted that downstream of the site is a public recreation area that many in the area, including Mr. Freitag and his wife, have used for over 30 years, that people fish and hunt in the area, and that this area has never been identified as threatening human health. He also noted a 1989 USACE study which indicated that the metal levels in blacknose dace (a small fish) downstream of the mine are probably of little to no significance from an ecological or human health standpoint, and that there was "little evidence in the literature that copper or the other metals tested in this study biomagnify in aquatic food chains." He questioned the scientific quality of the numerous reports on the water quality in the downstream waters and asserted that "agencies had selectively picked out facts and data to make a worst case scenario, rather than attempting an objective view of the situation."

Mr. Freitag also stated that the Group had been impressed with the responsiveness of EPA and the cooperation of the EPA project manager. He asserted that the characteristics of the site were such that the site could serve as a model for clean-up in a way that preserves its history and an educational model for innovative technologies. He expressed the Group's desire to be a partner in the response effort and that "we are on the way to a positive end," but still remain concerned about the scientific objectivity of the effort.

1.1.3.1 Support for Listing

Mr. Freitag stated that the Group he chaired, the Citizens for a Sensible Solution, is committed to finding a solution to ongoing environmental problems, and that its representative in the Elizabeth Mine Community Advisory Group voted in favor of NPL listing. He also wanted to "be clear" that "Citizens for a Sensible Solution is very much in favor of remediation of the environmental problems caused by the Elizabeth Mine." He stated that the Group "voted to recommend that Governor Dean [Governor of Vermont] ask for NPL listing" and that they "are not opposed to NPL listing."

In response, the Agency has added the Elizabeth Mine Site to the NPL. Listing makes a site eligible for remedial action funding under CERCLA, and EPA will examine the site to determine what response, if any, is appropriate. Actual funding may not necessarily be undertaken in the precise order of HRS scores, however, and upon more detailed investigation may not be necessary at all in some cases. EPA will determine the need for using Superfund monies for remedial activities on a site-by-site basis, taking into account the NPL ranking, State priorities, further site investigation, other response alternatives, and other factors as appropriate. EPA will not stop work at some sites to begin work at other higher-scoring sites added to the NPL more recently.

1.1.3.2 Size and Scope of Threat

Mr. Freitag stated that "we [the Citizens for a Sensible Solution] are concerned with what we feel is an exaggerated statement of the size and scope of the problem [at the Elizabeth Mine site] which may lead to an unnecessary drastic response. Our concern is that if we do not accurately portray the problem we will not achieve the best solution." He stated that "[i]n regards to the Hazard Ranking document: it appears that the threat to human health from surface water contamination which received a 100 out of 100 possible score is vastly overstated." He noted that downstream of where Copperas Brook enters the West branch of the Ompompanoosuc River is a USACE public recreation area which is a popular

swimming and fishing area that many in the area, including Mr. Freitag and his wife, have used for over 30 years. He stated that:

- the area had never been posted with warnings of threats to human health from metals contamination,
- the State of Vermont stocked the River for many years,
- Both Vermont and New Hampshire regularly test fish for contamination, and there have never been any warnings of threats to human health,
- the mine area is also a very popular deer hunting area, and there have never been any warnings or concerns raised about eating venison from deer that are taken out of this area,
- the most detailed study to date on fish by the USACE in 1990, titled "Effects of the Abandoned Elizabeth Copper Mine on Fisheries Resources of the West Branch of the Ompompanoosuc River," found that:
  - metal levels occurring in blacknose dace downstream of the mine are probably of little or no significance from an ecological or human health standpoint.
  - there is little evidence in the literature that copper or other metals tested in this study biomagnify in aquatic food chains. Trout that prey upon dace are thus unlikely to contain much higher whole body metal levels than reported for dace in this study,
  - levels of tested metals in trout muscles are likely to be much less than whole body values and would pose no risk to human health.

In response, the HRS score for the site overall and for the surface water pathway is correct. Mr. Freitag seems to misunderstand the relevance of the HRS score and site listing. An HRS evaluation is not a site-specific risk assessment. Listing a site using the HRS simply indicates that, relative to other sites that have been evaluated and based on limited information available after a minimal screening inspection, the site being evaluated scored at least 28.50 points and warrants further investigation. This investigation will determine the site-specific risk posed by releases of hazardous substances at the site and whether remediation is necessary. The HRS evaluation is based on the environmental characteristics of the site and of the releases that make up the site. As explained in the HRS documentation record, the HRS score for this site is based on: (1) the presence of large amounts of uncontained waste (over 40 acres of waste piles), (2) the discharge of acid mine drainage and toxic metals from these waste piles and from parts of the mine itself directly into surface waters supporting human food chain organisms and other sensitive environments, and (3) the fact that several of these toxic metals bioaccumulate in aquatic organisms.

The surface water pathway score of 100 is based only on the overland/flood component of the pathway. This score reflects the combined threat scores of 3.33 for the drinking water threat, 100.00 for the human food chain threat, and 34.06 for the environmental threat (pages 4, 5, 6, and 7 of the HRS documentation record as proposed). Since the pathway score is the sum of these three threats, with a maximum value of 100, the food chain threat alone justifies the pathway score (Section 4.1.5 of the HRS, *Calculation of overland flood migration component score for a watershed*). The surface water food chain threat score reflects a likelihood of release factor value of 550, based on an observed release to surface water (pages 33 through 40 of the HRS documentation record at proposal), a waste characteristics factor category value of 1000, based on a waste quantity factor value of 10,000 and a combined toxicity/persistence/ bioaccumulation factor value of 200,000,000 based on the presence of mercury in samples from two sources at the site (pages 56 and 57 of the HRS documentation record at proposal), and a food chain targets score of 45.030063 (pages 58 through 64 of the HRS documentation record at proposal). These

values are multiplied together and divided by 82,500, giving an uncapped threat score of 300.20 which is capped at 100.00 (Section 4.1.3.4 of the HRS, *Calculation of human food chain threat score for a watershed*).

If Mr. Freitag intended his statement, that an HRS score of 100 points for the surface water pathway misrepresents the threat posed by the site, as a criticism of the HRS itself, this comment is outside of the scope of this rulemaking. The HRS is, itself, a regulation, and was promulgated after public notice and comment on December 14, 1990 (55 FR 51532), and the Agency responded to all comments at that time.

Regarding Mr. Freitag's assertion that there has been little evidence or acknowledgment of human health threat via the food chain or actions taken to warn people of any threat due to the site, the HRS rule does not require that there be evidence or acknowledgment of human health threat via the food chain or actions taken to warn people of any threat due to a site in order for a site to qualify for listing on the NPL. The HRS score for this site is based on the presence of substances in the releases from the site sources that are known to bioaccumulate in the aquatic food chain to surface waters that are (or were prior to the releases) human food chain fisheries. As noted above, the collection of the necessary site-specific information, the evaluation of the information and the determination of the degree of risk posed by the site is evaluated during a different stage of the Superfund process, during the remedial investigation, which typically follows listing.

Further, as discussed on page 58 of the HRS documentation record as proposed, evidence does suggest the releases from the mining activities have had a deleterious effect on the aquatic community downstream of the mine. The 1990 USACE study referred to by the commenter states in its summary that "[t]he results of this study provide evidence that the Elizabeth Mine has had a severe impact on the fisheries resources of the Ompompanoosuc River. The study showed that the biomass of forage species was dramatically reduced downstream of the mine." (Reference 33 to the HRS documentation record, p.14.) In addition, as also noted on the same page of the HRS documentation record, in a more recent study (1998) performed by the State of Vermont titled "West Branch Ompompanoosuc River Assessment Report," the State described the environment of the surface water segment including Copperas Brook to the confluence of the West Branch of the Ompompanoosuc River and the Ompompanoosuc River as

> non-support of aquatic biota/habitat, all water supplies, recreation and aesthetics due to soluble and precipitated metals and acidity. [sic] thermal & habitat modifications and low DO [dissolved oxygen] due to an inactive copper mine and tailings and loss of riparian vegetation. (Reference 7 to the HRS documentation record as proposed)

Regarding the statement in the USACE study on the limited evidence of biomagnification of copper and other released substances, it is not clear whether the study means to suggest that these substances do not biomagnify or simply that there are few studies available. In either case, the Agency disagrees. The information available on the biomagnification of copper, zinc, and selenium, all of which have been released from the mine, supports the assigned factor values of 50,000, 500, and 5,000, respectively, for both human food chain and ecosystem bioaccumulation potential (pages 59 and 65 of the HRS documentation record). This evaluation is based on the directions in HRS Sections 4.1.3.2.1.3 *Bioaccumulation potential*, and 4.1.4.2.1.3 *Ecosystem bioaccumulation* using the information contained

in the EPA report titled "*Superfund Chemical Data Matrix*" (reference 2 to the HRS documentation record at proposal). HRS bioaccumulation factor values in the Superfund Chemical Data Matrix were derived from appropriate information specifically collected for the Agency in support of the HRS: Versar, Inc. 1990, *Issue Paper: Bioaccumulation Potential based on Ambient Water Quality Criteria Documents*, Contract No. 68-W8-0098. This information is supplemented using AQUIRE, an EPA database containing peer reviewed data from scientific papers published both nationally and internationally on the toxic effects of chemicals to aquatic organisms and plants, including the biomagnification effects of copper, zinc, and selenium. It should be emphasized that the commenter offered no alternative values and raised no specific issues with the factor value assignments or the reference material used to support them in the HRS documentation record.

1.1.3.3 Information Quality and Objectivity in Data Analysis

Mr. Freitag expressed concern regarding an alleged pattern of overstating the problem associated with Elizabeth Mine. He asserted that:

> While numerous reports of water quality in the West Branch [of the Ompompanoosuc River] have been prepared over the past twenty years, there has been no scientific research in the ordinary sense of the term–that is, no study with a clearly defined hypothesis, statistical measures of the significance of the result, and the publication in a refereed journal. What has happened is that agencies have selectively picked out facts and data to make a worst case scenario rather than attempting an objective view of the situation. Our concern is that we will not come out with the best solution unless it is based on sound science.

Mr. Freitag stated that the Group "remain[s] concerned though about what we feel is less than a scientifically objective look at the problem and feel that if this continues it could jeopardizes the success of what we all hope to achieve."

In response, EPA used available data to score the site under the HRS in a manner consistent with applicable CERCLA regulations and guidance. The HRS is the principal tool used by the Agency to evaluate and add hazardous sites to the National Priorities List for additional study and possible response action. In order to ensure that sites posing significant risks are not missed, the HRS employs a number of conservative assumptions. As in the present case, for example, the HRS scores incorporate waste characteristic factor values for the highest scoring substances at the site, regardless of the concentrations of those substances relative to other substances at the site in the relatively limited sampling that occurs as part of a site investigation. The HRS instructs in Section 2.4.1.2, *Hazardous substance selection*,

> Determine each combined factor value for a hazardous substance by multiplying the individual factor values appropriate to the pathway (or threat) [toxicity/persistence/ bioaccumulation, for example]. For each migration pathway (or threat) being evaluated, select the hazardous substance with the highest combined factor value and use that substance in evaluating the waste characteristics factor category of the pathway (or threat).

Any subsequent response actions that may be undertaken will not be based on limited data collected during the site inspection for use in the HRS evaluation, but rather on more detailed information assembled during a remedial investigation to provide a better understanding of the actual risk posed by the site. Mr. Freitag raised no specific comments regarding the quality or the accuracy of the data used in the HRS scoring.

The listing of a site on the NPL is a step in a screening process that allows the Agency to focus its resources on the sites that pose the most significant risk. To perform a risk assessment at all possible sites would be prohibitive in terms of time and resources. Instead, the Agency considers it more protective to first identify for further investigation those sites that may pose a risk, thereby screening out a large majority of sites identified as possible sites. This permits the Agency to focus resources on those remaining sites that may pose a substantial risk. This screening process takes advantage of readily available data, and ensures that sites are not removed from consideration because of a lack of available data. These conservative assumptions reflected in the HRS are then tested during the remedial investigation phase of the Superfund process.

1.1.3.4 Remedial Options

Mr. Freitag stated that "[t]he site, because of its history, location (in an area where there are few mine sites), size (large enough to be significant but not overwhelming), metals of concern (relatively benign iron and copper), and unique topography (nearly a quarter mile from the benchmark river), has the potential for being a model for cleaning up a site in a way that not only preserves its history but could be used as an educational model for innovative technologies."

Mr. Freitag closed by saying that the Group "want[s] to be a partner in the effort" to remediate the site, and "feel[s] that we are well on the way to a positive end."

In response, as explained previously in this support document, the determination of the need for remedial action at this site and the selection of the appropriate remedial response and technologies to use will be performed based on a site-specific evaluation of the site and the risk associated with it. Consistent with CERCLA and the NCP (section 300.430), this will include a remedial investigation, a feasibility study, and a risk assessment. A record of decision will be developed presenting the findings of these studies. Throughout this process public input is encouraged and public review and comments are solicited. Mr. Freitag and the members of the Group he represents will be given every opportunity to participate in this effort.

1.1.4 Conclusion

The original HRS score for this site was 50.00. Based on the above response to comments, the score remains unchanged. The final scores for the Elizabeth Mine Site are:

Ground Water:	Not Scored
Surface Water:	100.00
Soil Exposure:	Not Scored
Air:	Not Scored
HRS Score:	50.00

1.2 NUCLEAR METALS, INC., CONCORD, MASSACHUSETTS

1.2.1 List of Commenters and Correspondents

NPL-U33-3-1-1-R1	Comment dated August 30, 2000 from Marcie Marlow of Concord, Massachusetts (resident)
NPL-U33-3-1-2-R1	Comment dated August 29, 2000 from Pamela Swing of Concord Massachusetts (resident)
NPL-U33-3-1-3-R1	Comment dated September 2, 2000 from James L. West of Concord, Massachusetts (resident)
NPL-U33-3-1-4-R1	Comment dated September 7, 2000 from Phebe D. Ham of Concord, Massachusetts (resident)
NPL-U33-3-1-5-R1	Comment not dated from Helen W. Hawes of Concord, Massachusetts (resident)
NPL-U33-3-1-6-R1	Comment dated August 31, 2000 from Katharine Esty of Concord, Massachusetts (resident)
NPL-U33-3-1-7-R1	Comment dated September 1, 2000 from Sylvia Greene of Concord, Massachusetts (resident)
NPL-U33-3-1-8-R1	Comment dated September 5, 2000 from C. Ramsay of Concord, Massachusetts (resident)
NPL-U33-3-1-9-R1	Comment dated September 11, 2000 from Lee Ketelsen, New England Regional director, Clean Water Action, Boston, Massachusetts
NPL-U33-3-1-10-R1	Comment dated September 9, 2000 from Jean Rosner of Concord, Massachusetts (resident)
NPL-U33-3-1-11-R1	Comment dated September 14, 2000 from Elizabeth S. Dawson of Concord, Massachusetts (resident)
NPL-U33-3-1-12-R1	Comment dated September 15, 2000 from Maria Abate of Concord, Massachusetts (resident)
NPL-U33-3-1-13-R1	Comment dated September 14, 2000 from Carol Dwyer of Concord, Massachusetts (resident)
NPL-U33-3-1-14-R1	Comment dated September 14, 2000 from Al Armenti of Concord, Massachusetts (resident)

NPL-U33-3-1-15-R1	Comment dated September 14, 2000 from Bill Jackson, President of Concord Business Partnership
NPL-U33-3-1-16-R1	Comment dated September 14, 2000 from Judy Scotniebe of Concord, Massachusetts (resident)
NPL-U33-3-1-17-R1	Comment not dated from Caroline Ellis of Concord, Massachusetts (resident)
NPL-U33-3-1-18-R1	Comment dated September 8, 2000 from Elizabeth Oriel of Concord, Massachusetts (resident)
NPL-U33-3-1-19-R1	Comment dated September 18, 2000 from Bruce A. Gurall of Concord, Massachusetts (resident)
NPL-U33-3-1-20-R1	Comment dated September 21, 2000 from Jeanne S. Kangas of Arnold & Kangas, P. C., Counselors at Law
NPL-U33-3-1-21-R1	Comment not dated from Citizen's Research and Environmental Watch, (29 petitioners)
NPL-U33-3-1-22-R1	Comment dated September 20, 2000 from Todd A. Pulis, Owner, The Thoreau Club Camp & Outdoor Center
NPL-U33-3-1-23-R1	Comment dated September 21, 2000 from Debra A. Peattie, President, RCT BioVentures NE, LLC
NPL-U33-3-1-24-R1	Comment dated September 22, 2000 from Sisters of Charity Montreal, "Grey Nuns," Lexington Massachusetts (19 petitioners)
NPL-U33-3-1-25-R1	Comment dated September 21, 2000 from Richard W. Wheeler, Chairman, The Board of Selectmen, Concord, Massachusetts
NPL-U33-3-1-26-R1	Comment dated September 18, 2000 from Jane Alexander of Concord, Massachusetts (resident)
NPL-U33-3-1-27-R1	Comment dated September 18, 2000 from Eleanor Jean Abott of Concord Massachusetts (resident)
NPL-U33-3-1-28-R1	Comment dated September 25, 2000 from Julia Blatt, Executive Director, Organization for the Assabet River
NPL-U33-3-1-29-R1	Comment dated September 19, 2000 from Kevin Gilligan, Coordinator of Concord River Environmental Stream Team, 302 petitioners
NPL-U33-3-1-30-R1	Comment dated September 20, 2000 from James L. West, Coordinator, Citizens Research and Environmental Watch of Concord, Massachusetts

NPL-U33-3-1-31-R1	Comment dated September 21, 2000 from Timothy L. Rose of Concord, Massachusetts (resident)
NPL-U33-3-1-32-R1	Comment dated September 21, 2000 prepared by GZA GeoEnvironmental, Inc., GeoSyntec Consultants, and Bowditch and Dewey, LLP for Robert E. Quinn, President, of Starmet Corporation, Concord, Massachusetts
NPL-U33-3-1-33-R1	Comment dated September 20, 2000 prepared by Marvin Resnikoff of Radioactive Waste Management Associates for Citizens Research and Environmental Watch, Concord, Massachusetts
NPL-U33-3-1-34-R1	Comment dated September 20, 2000 from Ruth Weizenbaum of Concord, Massachusetts (resident)
NPL-U33-3-1-35-R1	Comment dated September 22, 2000 from W.B. Smith of Concord, Massachusetts (resident)
NPL-U33-3-1-36-R1	Comment dated September 21, 2000 from Stephanie Roeder, President, of Citizens Research and Environmental Watch, Concord, Massachusetts
NPL-U33-3-1-37-R1	Comment dated September 21, 2000 from Ralph H. Goodno, President, of Merrimack River Watershed Council, Lawrence, Massachusetts
NPL-U33-3-1-38-R1	Comment dated September 22, 2000 from Sister Gladys Martheglan of Sisters of Charity of Montreal, "Grey Nuns," Lexington, Massachusetts
NPL-U33-3-1-39-R1	Comment dated September 22, 2000 from M.T. Brace of Concord, Massachusetts (resident)
NPL-U33-3-1-L1-R1	Comment dated November 11, 2000 from Stephanie Roeder of Citizens Research and Environmental Watch, Concord, Massachusetts
NPL-U33-5-1-R1	Correspondence dated July 13, 2000 from Governor Argeo Paul Celluci of Massachusetts

1.2.2 Site Description

The Nuclear Metals, Inc. (NMI) facility is located on a 46.4-acre parcel at 2229 Main Street in Concord, Middlesex County, Massachusetts. The facility includes five interconnected buildings, a paved parking area, a sphagnum bog, a cooling water recharge pond, and a holding basin. The NMI facility currently operates as Starmet Corporation (Starmet).

The facility is bordered to the north by Main Street, commercial and residential properties, and the Assabet River; to the east by woodland and residential properties; to the west by woodland and commercial/industrial properties; and to the south by woodland and residential properties.

In 1958, NMI began operating a manufacturing facility on previously undeveloped land. They produced depleted uranium products, primarily as penetrators for armor piercing ammunition. NMI also manufactured metal powders for medical applications, photocopiers, and specialty metal products, such as beryllium tubing used in the aerospace industry.

From 1958 to 1985, NMI discharged wastes to an unlined holding basin. Cast depleted uranium ingots or billets were jacketed, sealed, and evacuated in copper cans, which were then heated and extruded into long rod stock. The extruded depleted uranium rod had a resulting thin layer of copper coating which was removed in a nitric acid pickling operation. During the pickling process, “small quantities” of copper and uranium were dissolved in the nitric acid. The spent nitric acid solution was collected, neutralized with a lime slurry, and then discharged to the unlined, in-ground holding basin. “Small quantities” of other specialty metal products including steel jacketed beryllium, stainless steel, and titanium alloys were also pickled at various times with several different acids (nitric, hydrofluoric, hydrochloric, and sulfuric), and discharged to the holding basin. The discharge to the holding basin ceased in 1985 when NMI began using an acid closed-loop recycling process.

In addition to natural and depleted uranium (as elemental, oxide, and fluoride), NMI handled thorium and thorium oxide under license to the Nuclear Regulatory Commission (NRC); sulfuric and nitric acids for process activities; 1,1,1-trichloroethane as a solvent; trichlorofluoroethane as a degreaser; zirconium; magnesium; beryllium; acetone; hydrogen peroxide; flammable gases (propane and acetylene); and oxygen. Two 10,000-gallon underground storage tanks were used for the storage of No. 4 fuel oil. Several of the following oils were used and recycled on site: DTE light, DTE heavy, Medium DTE 25, vacuum oil (HE1SO), and No. 7d.

On October 1, 1997, Nuclear Metals, Inc. was renamed Starmet Corporation. In March 1997, the company’s license to handle source material (including depleted uranium, thorium, and thorium oxide) under the NRC was transferred to the Massachusetts Department of Public Health. In accordance with Massachusetts state license SM-0179, Starmet is allowed to use source material (including depleted uranium, thorium, and thorium oxide) to manufacture, research, develop, and distribute metallic products in a variety of forms including castings, extensions, and metal powders. Starmet continues to conduct a variety of metallurgical tasks including: extrusions, beryllium aluminum alloy investment coatings, and depleted uranium processing. According to Starmet, one-third of Starmet’s core business is producing specialty metal powder using a rotating electrode process.

1.2.3 Summary of Comments/Correspondence

Starmet Corporation (herein referred to as Starmet) opposed the placement of the Nuclear Metals site on the NPL. Starmet contended that a “detailed analysis of EPA’s HRS Package reveals numerous errors,

omissions, and inadequacies of such a significant nature that EPA should remove Starmet [Nuclear Metals Inc.] from its list of proposed sites and reanalyze the property in light of **all** of the available data and information." Starmet's comments addressed policy and HRS technical issues. Starmet commented that listing the site goes against the requirements of the Regulatory Flexibility Act and Executive Order 12866. Starmet also commented that the listing will have a negative economic impact on the Concord community. Starmet added that listing is not need to ensure remediation of the site.

Starmet's comments also addressed the HRS scoring of the NMI site. According to Starmet, the sources were inappropriately characterized, and the observed release concentration of hazardous substances are within background, or naturally occurring levels; the contaminants are infrequently found in samples such that they do not meet the criteria for chemicals of concern as stated in the *Risk Assessment Guidelines for Superfund*; or they are not solely attributable to the site. Starmet also contended that the HRS did not use all the available information to best characterize the migration of hazardous substances in ground water. According to Starmet, the EPA evaluated ground water wells that are not hydrologically connected to the aquifer at the NMI site. Starmet contended that the overall site score resulted in a distance-weighted population value as if a vast amount of people have the potential to consume contaminated drinking water.

Four commenters, opposing the listing of the NMI site, stated that the economic impact on the community is considerable and should be considered by EPA [NPL-U33-1-15-R1, NPL-U33-1-19-R1, NPL-U33-1-20-R1, NPL-U33-1-22-R1]. Ms. Jeanne S. Kangas, Attorney at Law, of Arnold & Kangas, P.C.; Mr. Bruce A. Gurall of Concord Property Management Inc.; and Mr. Todd A. Pulis, Owner, of The Thoreau Club Camp & Outdoor Center, stated that a Superfund site within the Town of Concord will have a negative impact on local businesses. Mr. Bill Jackson, President of Concord Business Partnership, stated that Starmet has been a viable, responsible company and should be allowed to proceed without being designated a Superfund site. Other opposing comments include that listing will further delay cleanup efforts by Starmet.

Mr. Argeo Paul Cellucci, Governor of Massachusetts, supported the placement of Nuclear Metals Inc. on the National Priorities List.

Thirty five comment letters were submitted in support of listing the Nuclear Metals site on the NPL. Several environmental groups favored listing the site, and several comment letters had petition signatures. In these letters, residents of Concord and nearby towns commented that contamination of the aquifer poses a serious risk, and EPA has the ability to ensure a thorough cleanup.

1.2.3.1 Support for Listing

Thirty six comment letters, inclusive of the governor's letter, were submitted in favor of placement of the Nuclear Metals, Inc. site on the NPL. Twenty-six of these comment letters were from citizens of Concord and nearby towns, seven were from environmental groups (Citizen's Research and Environmental Watch (4 letters), The Concord River Environmental Stream Team, Merrimack River

Watershed Council, and Clean Water Action), one was from a private business (Radioactive Waste Management Associates), one was from a government entity (Town of Concord Board of Selectmen), and one was a letter from Governor Argeo Paul Cellucci of Massachusetts. Several letters were petition letters with a total of 348 signatures.

Comments in these letters in support of the listing include the following: future generations will be secure from the contamination on the Starmet property; contamination in the aquifer creates a dangerous situation; EPA has the best ability to ensure a thorough cleanup; the site is located upstream of a federally designated wild and scenic section of the Assabet River; and reports prepared by Starmet's contractor, GZA, are written to obscure the information as much as possible. Ms. Judy Scotniebe suggested scoring the soil exposure pathway and questioned the availability of air emission data for the NMI site. [NPL-U33-3-1-16-R1]

In response, the Agency has added the Nuclear Metals Inc. site to the NPL. Listing makes a site eligible for remedial action funding under CERCLA, and EPA will examine the site to determine what response, if any, is appropriate. Actual funding may not necessarily be undertaken in the precise order of HRS scores, however, and upon more detailed investigation may not be necessary at all in some cases. EPA will determine the need for using Superfund monies for remedial activities on a site-by-site basis, taking into account the NPL ranking, State priorities, further site investigation, other response alternatives, and other factors as appropriate.

Regarding Ms. Scotniebe's comment to score the soil exposure pathway, the HRS does not require scoring all four pathways, if scoring those pathways does not change the listing decision. For some sites, data for scoring a pathway are unavailable, and obtaining these data would be time-consuming or costly. In other cases, data for scoring some pathways <u>are</u> available, but will only have a minimal effect on the site score. In still other cases, data on other pathways could substantially add to a site score, but would not affect the listing decision. The HRS is a screening model that uses limited resources to determine whether a site should be placed on the NPL for possible Superfund response. A subsequent stage of the Superfund process, the RI, characterizes conditions and hazards at the site more comprehensively.

To the extent practicable, EPA attempts to score all pathways that pose <u>significant</u> threats. If the contribution of a pathway is minimal to the overall score, in general, that pathway will not be scored. In these cases, the HRS documentation record may include a brief qualitative discussion to present a more complete picture of the conditions and hazards at the site. As a matter of policy, EPA does not delay listing a site to incorporate new data or score new pathways, if the listing decision is not affected.

EPA must balance the need to fully characterize a site with the limited resources available to collect and analyze site data. For this reason, the EPA generally will not score additional pathways upon receiving new data as long as the site still meets the HRS cutoff score. However, any additional data characterizing site conditions could provide useful information during the RI.

The HRS is intended to be a “rough list” of prioritized hazardous sites; a “first step in a process--nothing more, nothing less” Eagle Picher Indus. v. EPA, 759 F.2d 922, 932 (D.C. Cir. 1985) (Eagle Picher II). EPA would like to investigate each possible site completely and thoroughly prior to evaluating them for proposal for NPL, but it must reconcile the need for certainty before action with the need for inexpensive, expeditious procedures to identify potentially hazardous sites. The courts have found EPA's approach to solving this conundrum to be “reasonable and fully in accord with Congressional intent. “Eagle Picher Industries, Inc.” v. EPA, (759 F.2d 905 (D.C. Cir. 1985) Eagle Picher I).

1.2.3.2 Federal Executive Order 12866

Starmet stated that Executive Order 12866 of September 30, 1993, directs the EPA as well as other agencies to consider the effects of their regulatory actions on small businesses. According to Starmet, itself a small business, EPA should work towards the goals expressed in Executive Order 12866. Citing from the Federal Register (58 FR 51735), Starmet noted in its comments that Executive Order 12866 specifically provides for the following:

> ‘Costs and benefits shall be understood to include both quantifiable measures (to the fullest extent that these can be usefully estimated) and qualitative measures of costs and benefits that are difficult to quantify, but nevertheless essential to considering. *** Each agency shall assess both the costs and the benefits of the intended regulation and, recognizing that some costs and benefits are difficult to quantify, propose or adopt a regulation only upon a reasoned determination that the benefits of the intended regulation justify its costs. [see 58 Fed. Reg. 51735]’

According to Starmet, EPA failed to follow Executive Order 12866, and EPA should work towards this goal which is expressed by the Order:

> ‘The American people deserve a regulatory system that works for them, not against them: a regulatory system that protects and improves their health, safety, environment and well-being and improves the performance of the economy without imposing unacceptable costs on society...We do not have such a regulatory system today. [See 58 Fed. Reg. 51735]’

In response, the statements in the Federal Register notice of the proposed rule for this site (65 FR 46135 (July 27, 2000)) meet all procedural requirements for the application of Executive Order 12866. The proposed rule states that “Under Executive Order 12866, (55 FR 51735 (October 4, 1993)) the Agency must determine whether a regulatory action is ‘significant’ and therefore subject to OMB review and the requirements of the Executive Order” (65 FR 46135). The proposed rule further adds that “the Office of Management and Budget (OMB) has exempted this regulatory action from Executive Order 12866 review” (65 FR 46135).

Moreover, the proposed rule for this site clearly states that:

> The Order defines 'significant regulatory action' as one that is likely to result in a rule that may: (1) Have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities; (2) create a serious inconsistency or otherwise interfere with an action taken or planned by another agency; (3) materially alter the budget impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or (4) raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order (65 FR 46135).

Thus, because none of these criteria apply to the NMI site, the proposed rule is exempt from Executive Order 12866. Moreover, Starmet has failed to provide evidence that the listing is a significant regulatory action as defined above.

1.2.3.3 Regulatory Flexibility Act

Starmet stated that EPA erred in its failure to conduct a Regulatory Flexibility Analysis (RFA) based on its flawed reasoning that the proposed listing would have no significant economic effect upon small business. Starmet commented that EPA stated "at this time EPA cannot identify the potentially affected businesses or estimate the number of small businesses that might also be affected." Starmet concluded that, contrary to law, EPA provided no case-by-case factual support for this conclusion. Starmet also stated that there is a high likelihood that listing Starmet on the NPL will have a broad, detrimental effect on Concord businesses because Concord has a strong relationship between the economic prosperity of the local businesses and the quality of the Town's environment, as is demonstrated by the importance of tourism to the local economy. Starmet added that the negative attention combined with the stigma effect of a federally listed Superfund site in Concord will likely impact real estate prices and has potential to cause great harm. According to Starmet, this warrants further detailed analysis by EPA.

Similarly, the Concord Business Partnership commented that the economic impact on the community is considerable and questioned how EPA plans to evaluate this impact. [NPL-U33-1-15-R1]

In response, as stated in the Federal Register notice for the proposal to add this site to the NPL (65 FR 46135 (July 27, 2000)), the RFA does not apply to this rule. Under RFA Section 601(2), the term "rule" does not include a rule of "particular applicability relating ... to facilities...." 5 USC 601(2). Although EPA provides notice and an opportunity to comment on the listing of sites on the NPL, each listing is a separate rule that applies only to one facility or site. Thus, the RFA does not apply to the listing of the NMI site on the NPL.

Moreover, the listing of this site on the NPL does not impose any obligations on small entities or any other identifiable group. The rule sets no standards or regulatory regime that any small entity must meet. The listing imposes no liability on any small entity. Instead, as discussed in the proposed rule, the effects of listing this site or any other site on the NPL are only indirect. For example, if the Agency conducts response actions at the NMI site using money from the Superfund, EPA could pursue to recover its costs from liable parties. However, such an enforcement action is not within the scope of the RFA.

Even if the RFA did apply to the listing of the NMI site on the NPL, the statute does not require EPA to assess the impact on small entities which are not subject to a rule (Motor & Equipment Manufacturers Ass'n v. Nichols, 142 F.3d 449 (D.C. Cir. 1998)). The RFA only requires an initial analysis to contain information on "small entities to which the proposed rule would apply" 5 USC 603(b). As discussed above, the listing of the NMI site does not apply to any small entity because it imposes no obligations. The listing certainly does not impose any obligation on any small businesses in the Concord, Massachusetts, area. Thus, the Agency is under no obligation pursuant to the RFA to assess the impacts on such small businesses.

Starmet and other commenters provided no information (other than general assertions) as to the adverse impacts on small entities. Nor did Starmet submit information to support its claim that it is a small entity under the RFA.

1.2.3.4 Listing Discretion-Delay Listing

Starmet commented that NPL listing is not necessary to ensure that the site is adequately addressed. According to Starmet, there are two viable potentially responsible parties, and EPA policy requires that the Agency handle this as an enforcement lead site, not fund-financed. Starmet also stated that it "should be provided with a reasonable opportunity to finalize the involvement of the United States Army - the principal responsible party at this site - in working with Starmet to implement an expedited remediation at this property." According to Starmet, "EPA's vast resources would be much better used focusing on the enormous opportunity for an expedited site cleanup by playing a role in facilitating that result." Starmet added that EPA should have affirmatively responded to Starmet's request for additional time to allow Starmet to respond to specific issues raised by EPA and DEP, which were the basis for proceeding with the proposed listing. Starmet stated the government failed to treat Starmet in good faith, and this demonstrates that the proposed listing of the site is motivated by political considerations, rather than sound science.

Starmet also stated that its analysis of the HRS package reveals numerous errors and omissions such that the EPA should, at a minimum, delay the listing for at least one year. Starmet stated that this would provide an opportunity for the potentially responsible parties (PRPs) to implement response actions in accordance with both state and Federal law.

The Concord Business Partnership, Inc. [NPL-U33-1-15-R1], Bruce A. Gurall of the Concord Property Management, Inc. [NPL-U33-3-1-19-R1], and Todd A. Pulis of The Thoreau Club [NPL-U33-3-1-22-R1]

commented that Starmet has taken positive steps to clean up the site and should not be punished by listing. Mr. Gurall added that under the current cleanup program, the site will be remediated long before it ever would be under Superfund.

In response, EPA has placed the NMI site on the NPL because the HRS site score was sufficient to warrant listing. CERCLA Section 105 (a)(8)(A) required the establishment of criteria for determining priorities among releases or threatened releases; the Agency listed three methods in the NCP by which releases may be determined eligible for the NPL. As one of the three methods for placing a site on the NPL, the NCP at 40 CFR 300.425(c)(1) states that a release may be included on the NPL if "[t]he release scores sufficiently high pursuant to the Hazard Ranking System as described in Appendix A to this part (40 CFR Part 300.425)." As indicated in the HRS documentation record for the NMI site, the site scored 58.31, which is well above the HRS cutoff score of 28.50, and it remains so after consideration of the comments received regarding the proposed listing (page 2 of HRS documentation record; 55 FR 51569 (December 14, 1990)).

Regarding Starmet's comment that it should be provided with an opportunity to finalize the involvement of the U. S. Army, the principal PRP, the Agency neither confirms nor denies the accuracy of the commenters' statements as to who was liable for the contamination at and released from this site. Liability is not considered in evaluating a site under the HRS. The NPL serves primarily as an informational tool for use by the Agency in identifying those sites that appear to present a significant risk to public health or the environment. It does not reflect a judgment on the activities of the owner(s) or operator(s) of a site. It does not require those persons to undertake any action, nor does it assign any liability to any person. This position, stated in the legislative history of CERCLA, has been explained more fully in the Federal Register (48 FR 40759, September 8, 1983 and 53 FR 23988, June 24, 1988). See Kent County v. EPA, 963 F.2d 391 (D.C. Cir. 1992). Thus, at the time of listing EPA need not fully identify the involvement of all potentially responsible parties in order for listing to proceed. As a matter of policy, EPA does not delay listing a site to incorporate new data or to address liability issues.

The contamination found at the NMI site was sufficient to warrant listing. The ground water migration pathway scored the maximum assigned value under the HRS, and the environmental threat component of the surface water migration pathway also scored the maximum assigned value (pages 4 and 6 of the HRS documentation record). The observed release of hazardous substances (acetone, benzene, carbon disulfide, 1,1-dichloroethane, 1,1-dichloroethene, cis-1,2-dichloroethene, napthalene, tetrachloroethene, toluene, vinyl chloride, beryllium, copper, iron, manganese, molybdenum, uranium, ^{228}thorium, ^{230}thorium, and ^{232}thorium) to the aquifer subjects an HRS distance-weighted population of 8190 to potential contamination attributable to the NMI site (page 50 of the HRS documentation record). The sphagnum bog, an isolated wetland, is subjected to Level I concentrations of copper. This bog is also a state-designated area for the protection and maintenance of aquatic life. The conditions at the NMI site and the targets impacted suggest that the site poses sufficient risk to warrant listing. See Section 1.2.3.5 of this support document for further discussion.

With regard to Starmet's comment that EPA policy requires that the Agency handle this site as an enforcement lead site, rather than a fund-financed site, Starmet did not say which EPA "policy" it is referring to. Nonetheless, the issue of fund-financed sites is a remediation issue and is not an NPL listing criterion.

1.2.3.5 Risk

Starmet commented that the HRS package did not develop an understanding of the potential range or risks at the site. According to Starmet, EPA's own *Risk Assessment Guidelines for Superfund* (*RAGS*)[1] clearly indicate that actions at Superfund sites should be based on an estimate of the reasonable maximum exposure (RME) expected to occur under current and future conditions. Starmet stated that, in contrast, the HRS includes factors for evaluating the "maximally exposed individual" (MEI) by directly incorporating unreasonably conservative and, therefore, capricious input parameters that yield estimates of exposure far beyond the RME. According to Starmet, use of the RME not only superseded the MEI, but USEPA guidance directly repudiated the use of the MEI when implementing this update due to the problem of compounding very low probabilities.

Concerning the Sphagnum Bog, Starmet stated that a bioassessment of the bog was conducted as part of a Phase II investigation by Starmet, and based on the preliminary assessment of the bioassessment conducted by Starmet on the bog, it does not appear that the communities of aquatic, semi-aquatic, or terrestrial invertebrates have been altered as a result of exposure to site-related contaminants in the surface water and peat of the bog.

In response, it is beyond the scope of the HRS, as a screening tool, to provide quantitative risk assessment evaluations. As the primary method for placing sites on the NPL, the HRS is intended to measure "relative" rather than absolute risk and consequently has been designed so that it may be consistently applied to a wide variety of sites. As stated in CERCLA Section 105, Congress required that EPA revise the HRS such that it "accurately assesses the *relative* degree of risk to human health and the environment posed by sites and facilities subject to review" (emphasis added). In so doing, the current HRS became EPA's primary tool for placing hazardous waste sites on the NPL.

With specific regard to the use of the *Risk Assessment Guidelines for Superfund Sites*, the evaluation of targets under the HRS is not required to meet guidelines set forth in that document (HRS Section 2.5, *Targets*). To the extent that Starmet's comment questions the adequacy of the HRS and its ability to adequately evaluate targets, Starmet's comment is beyond the scope of this rulemaking; the current HRS was promulgated on December 14, 1990 (55 FR 51532) after notice and comment. In as much as this comment is on the HRS itself, this comment is untimely. As a screening tool, the HRS is not designed to assess site-specific risk, whereas the use of *RAGS* guidelines is designed for response and remedial solutions specific to the site, as opposed to screening sites for the NPL. As stated above, the HRS is

[1]Starmet also cited additional guidance by headquarters and the region: Superfund's Standard Default Exposure Factors for the Central Tendency and Reasonable Maximal Exposure (EPA/600/D-93-90, November 1993); Supplemental Guidance to RAGS; Region 4 Bulletins, November 1995; Risk Updates, USEPA Region 1, August 1994.

intended to measure "relative" rather than absolute risk and consequently has been designed so that it may be consistently applied to a wide variety of sites. It is beyond the scope of the HRS, as a screening tool, to provide quantitative risk assessment evaluations.

In addition, even the *RAGS* RME is designed to "estimate a conservative exposure case (i.e., well above the average case) that is still within the range of possible exposures. Uncertainty is still evaluated under this approach" (*RAGS*, Part A, Section 6.1.2, page 6-5 (1989)). Moreover, and contrary to Starmet's implication, the HRS does not perform an exposure assessment or a baseline risk assessment. A Superfund risk assessment is site-specific and ensures the risk posed by each hazardous substance is assessed via the potential exposure route(s) present at the site. The HRS measures the relative risk posed by sites in relation to other sites scored for listing on the NPL.

Although the evaluation of the nearest well factor is considered an MEI, the HRS assessment of the MEI, in this case, is not the same as a RAGS MEI assessment. Under the HRS, the nearest ground water well is assigned additional points depending on the level of contamination in the well or the distance from the sources at the site (HRS Section 3.3.1). These factors, while they do reflect the possible threat posed to the individual, are not actual measures of the risk to them, unlike an MEI in a risk assessment.

With regard to the risk posed to the sphagnum bog, as noted on pages 87 to 89 of the HRS documentation record as proposed, the contamination level is higher than the AWQC. The AWQC is an ecological-based benchmark that reflect a level of contamination that can result in acute or chronic effects on the aquatic biota. However, a more precise assessment of the risk posed to the environmental targets and of the need for remedial response will take place during the remedial investigation/feasibility study (RI/FS) and record of decision (ROD) stage of the evaluation process. If at that time the Agency determines that no further actions are warranted, the site may be removed from the NPL. Until that time, however, based on the HRS evaluation, the Agency considers it reasonable to proceed with the listing process.

1.2.3.6 Petroleum Exclusion

Starmet commented that the polyaromatic hydrocarbons (PAHs) detected in the Cooling Water Recharge Pond are petroleum-related hazardous substances that migrated to the pond. Starmet stated that the sources of the PAHs could be runoff from driveways and parking and loading areas where PAHs are commonly observed as non-point source pollution. Starmet also stated that another source of the PAHs is the accidental spill of 5 gallons of fuel oil in 1990, which is referenced on page 17 of the HRS documentation record. For the PAH compounds in Source 3, Starmet contended that these substances are indicative of anthropogenic sources such as auto exhaust. According to Starmet, these substances are not regulated under CERCLA because PAHs from petroleum releases are exempt from hazardous substance listing based on CERCLA Sections 101(14) and 101(33) which excluded petroleum from the definition of hazardous substances and pollutants or contaminants.

In response, the Agency does not agree that the PAHs identified in the sources at the site should not be evaluated in HRS scoring because they are covered by the CERCLA petroleum exclusion. CERCLA Section 101 (14) states the following:

> The term [hazardous substance] does not include petroleum, including crude oil or any fraction thereof which is not otherwise specifically listed or designated as a hazardous substance under subparagraphs (A) through (F) of this paragraph, and the term does not include natural gas, natural gas liquids, liquefied natural gas, or synthetic gas usable for fuel (or mixtures of natural gas and such synthetic gas).

The scope of the petroleum exclusion is explained in a July 31,1987 EPA memorandum prepared by Francis S. Blake, EPA General Counsel (herein referred to as the Blake Memo). According to the Blake Memo, "if the petroleum product and an added hazardous substance are so commingled that, as a practical matter, they cannot be separated, then the entire oil spill is subject to CERCLA response authority." The Blake Memo, citing from the April 4, 1985 *Federal Register* (50 FR 13460 (April 4, 1985)), states the following:

> EPA interprets the petroleum exclusion to apply to materials such as crude oil, petroleum feedstocks, and refined petroleum products, even if a specifically listed or designated hazardous substance is present in such products. However, EPA does not consider materials such as waste oil to which listed CERCLA substances have been added to be within the petroleum exclusion.

At the NMI site, the following PAH compounds were identified in contaminated sediments in the Cooling Water Recharge Pond (Source 2): anthracene, benzo(a)anthraecene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, fluoranthene, indeno (1,2,3-cd)pyrene, naphthalene, phenanthrene, and pyrene (page 26 of the HRS documentation record). Benzo(a)anthraecene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, fluoranthene, indeno(1,2,3-cd)pyrene, phenanthrene, and pyrene were identified in contaminated soil samples in Source 3 at the NMI site (page 31 of the HRS documentation record). Although these PAH compounds are constituents of petroleum products, they could also be constituents of waste oil and non-point runoff, and so, are not covered by the petroleum exclusion. As products of combustion, they may be excluded under the petroleum exclusion (CERCLA Section 101 (22)); but Starmet has not shown that the PAHs present at the site are exclusively a product of combustion. Thus, the PAHs are not necessarily excluded from HRS scoring unless it is shown their source is petroleum. This has not been done.

Starmet claims in its comments that contamination at the NMI site could have resulted from driveways and parking and loading areas and auto exhaust where PAHs are commonly observed as non-point source pollution. The fact that the PAH contamination in Sources 2 and 3 could have resulted from contamination caused by waste oil leaks from automobiles does not make them eligible for the CERCLA petroleum exclusion. As stated in the Blake Memo, waste oil is not eligible for petroleum exclusion. Additionally, according to Reference 66 of the HRS documentation record, *Review of Nuclear Metals, Inc. Facility (Full Report)* (May 1989), a number of oils were recycled on-site, indicating that the facility also handled waste oil. Site information also indicates that former waste storage areas on-site may have

stored waste machining oils that could have been carried via runoff to the source areas (pages 17, 20, and 30 of the HRS documentation record; page 2 of Reference 52 of the HRS documentation record). Release from either of these sources of waste are not covered by the CERCLA petroleum exclusion.

Regarding the fuel oil spill, while the hazardous substances associated with a fuel oil spill are not eligible for CERCLA evaluation, Starmet has not shown that the PAH contamination at the NMI site is solely a result of these spills. Starmet has not documented that the PAHs are a result of product spills.

In summary, the PAH compounds are not necessarily eligible for exclusion under CERCLA because contamination at the site may not have been derived exclusively from petroleum products or fractions thereof; contamination was possibly derived from waste oils; and the hazardous substances are commingled with non-excluded hazardous substances that are not constituents of petroleum. Thus, the petroleum exclusion does not apply.

Moreover, even if EPA does not consider in scoring the following PAH hazardous substances, anthracene, benzo(a)anthraecene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, fluoranthene, indeno (1,2,3-cd)pyrene, naphthalene, phenanthrene, and pyrene (all PAHs), detected in Source 2 and/or Source 3, the site score remains unchanged (pages 4 to 8, 26, 31, 43 to 45, and 81 to 86 of the HRS documentation record as proposed). These substances are used in calculating the waste characteristics pathway values, specifically the chemical characteristics values.

Negating the contribution of the PAH compounds to the HRS evaluation has no impact on the ground water pathway score because vinyl chloride, beryllium, manganese, ^{230}Thorium, and ^{232}Thorium are also used to calculate the toxicity/mobility value of the waste characteristics component of the ground water pathway score (HRS documentation record as proposed, page 44).

For the surface water pathway, negating the contribution of the PAHs would reduce the waste characteristics assigned value from 320 to 180. However, the overall pathway score would remain unchanged. That is, the ecosystem toxicity/persistence factor value for ^{210}Lead and ^{226}Radium is 10,000, which, when multiplied by the hazardous waste quantity factor value of 100, yields an ecotoxicity/persistence/hazardous waste quantity factor value of 1,000,000. The bioaccumulation potential factor value for ^{210}Lead and ^{226}Radium is 5,000, which, when combined with the ecotoxicity/persistence/hazardous waste quantity factor value of 1,000,000, yields a toxicity/persistence/bioaccumulation factor value of 5,000,000,000 (5×10^9 or 5E+9) (HRS documentation record as proposed, pages 83 to 86). According to HRS Table 2-7, an ecotoxicity/persistence/hazardous waste quantity/bioaccumulation potential factor of 5×10^9 yields a waste characteristics factor category value of 180. Although this value is lower than the 320 assigned using benzo(a)anthracene or benzo(a)pyrene, the overall site score remains unchanged because when the waste characteristics of 180 is combined with the observed release assigned value of 550 and the targets

assigned value of 300, an environmental threat score[2] of 60, the maximum, is still achieved (HRS documentation record, pages 7, 8, 81 to 86; HRS Tables 2-7, *Waste Characteristics Factor Category Values*, and 4-1, *Surface Water Overland/Flood Migration Component Scoresheet*).

1.2.3.7 Removal Activities

Starmet contended that EPA ignored the post-remediation condition of the former Holding Basin. Starmet commented that the HRS evaluation of the former Holding Basin (Source 1) did not consider the remedial activities and failed to consider the extensive data that documents the remediation of this source. According to Starmet, the removal activities resulted in the proper off-site transport and disposal of the sludge material which had been lawfully discharged to the former Holding Basin from 1958 to 1985, and this removal action excavated the entire surface impoundment as well as approximately 5 feet of soil from below the surface impoundment. Starmet contended that this source no longer exists and did not exist at the time the HRS process was conducted. According to Starmet, EPA should consider removal activities when calculating waste quantities, and Section Q of the preamble to the HRS indicates that EPA will calculate waste quantities based on current conditions.

Starmet also stated that the listing package failed to establish a cutoff date for use of data and available reports. According to Starmet, because EPA acknowledged the remediation of the holding pond, as well as the use of data generated after the remediation of the holding basin, "all data generated until the most recent document cited (May 2000) must be included in the review, and the impact of the site remediation must be fully considered." Starmet commented that EPA's failure to follow its own regulations on remedial actions arbitrarily and capriciously increased the total score for the site.

Starment also contended that a Phase II report included in the HRS package documents a removal activity in Source 1. According to Starment, soil from the area surrounding sample SB-8 was excavated and removed from the site in 1998.

In response, the removal activities conducted by Starmet at the holding basin do not qualify as response activities to be considered in HRS scoring under EPA's policies regarding removal activities. In evaluating the response activities at the Holding Basin, EPA considered the guidelines in OSWER Directive 9345.1-03FS, *The Revised Hazard Ranking System: Evaluating Sites After Waste Removals*, October 1991, and OSWER Directive 9345.1-25, April, 1997, *Revision to OSWER NPL Policy The Revised Hazard Ranking System: Evaluating Sites After Waste Removals*, October 1991. The following criteria, according to these two documents, should all be met for a site activity to be considered a "qualifying removal" and thus to be excluded from HRS scoring:

- The waste subject to removal must be physically removed from the site.
- All waste removed must be disposed or destroyed at a facility permitted under the Resource

[2]Calculation of the NMI environmental threat score: (550 x 180 x 300)/82,500 = 360. A maximum of 60 can be assigned for the environmental threat score (HRS Table 4-1)

Conservation and Recovery Act, Toxic Substances Control Act, or by the Nuclear Regulatory Commission.

- Post-SI and Pre-NPL removal activity can be considered in the following situation:

  where the Region has documentation (e.g., OSC Removal Site File containing responsible party work plans, sampling data, closeout assessment) that clearly demonstrates there is *no remaining release or potential for a release that could cause adverse environmental or human health impacts* (e.g., all releases have been dealt with such that hazardous substances are not present at potentially harmful levels). Otherwise the removed waste should be counted in the HRS waste quantity value calculation. (OSWER 9345.1-25) [emphasis added].

Also, the preamble to the HRS states that "Potentially responsible parties undertaking removal actions will have the primary responsibility for collecting any *data needed to support a determination of the quantity of hazardous constituents remaining*" (Section Q of the Preamble to the HRS) [emphasis added].

For the Holding Basin, the removals were not qualifying removals because there is evidence indicating that there are remaining releases from this source, and the past releases have not been remediated such that there are no threats to human health or the environment. Samples collected from the Holding Basin by GZA, Starmet's contractor, in November/December 1999 and reported in Reference 89 of the HRS documentation record, *Holding Basin Soil Characterization Study, Starmet Corporation*, dated May 2000, document the presence of hazardous substances in the Holding Basin after the removal activity. Page 6 of the *Holding Basin Soil Characterization Study, Starmet Corporation* states that the average uranium concentration is 215 parts per million. These post-removal data confirm that contaminants are still present in the Holding Basin.

Also, the removal actions have not removed the threat posed by hazardous substance migration from the sources prior to these actions. The observed release to the monitoring wells on site and to the sphagnum bog has not been remediated such that there is no threat to human health or the environment. The preamble to the HRS also states that the accuracy of calculating waste quantity based on current conditions also depends on being able to determine with reasonable confidence the quantity of hazardous constituents remaining in sources at the site and the *quantity released to the environment.* EPA knows of no attempt by Starmet or its contractors to assess the extent of contamination remaining at the site, either in the sources or in environmental media as a result of migration from the sources prior to response actions.

Further, even if EPA discounted the hazardous waste quantity of the Holding Basin (Source 1) and the Contaminated Soil (Source 3) from the overall site hazardous waste quantity, the site score would remain unchanged. That is, the hazardous waste quantity of Source 2, the Cooling Water Recharge Pond, would still support the site hazardous waste quantity of 100 (page 29 of the HRS documentation record as proposed). Moreover, if the hazardous waste quantity for the ground water or the surface water cannot be adequately determined, the site hazardous waste quantity can still be assigned a default value of 100, which is the same value used to assess the hazardous waste quantity at the site in the proposed HRS

evaluation of NMI (HRS Section 2.4.2.2). Further, most of the hazardous substances associated with Source 1, except for nitric acid, sulfuric acid, calcium, thorium, ^{210}Lead, ^{226}Radium, and ^{230}Thorium, are also associated with either of the two other sources at the site (pages 43 and 65 of the HRS documentation record), and there would be no impact on the overall site score. Thus, the elimination of the contribution of the Holding Basin waste would not affect the site hazardous waste quantity or the waste characteristics assigned value.

Regarding Starmet's comment that a cutoff date was not established for this site, the timing of removal activities is explained in OSWER Directive 9345.1-25. OSWER 9345.1-25 states that certain types of post-site inspection removal actions can be considered up until the time of listing. That is, there is no cutoff date for evaluating qualifying removals. In the case of the NMI site, the removal activities were not considered in HRS scoring because they are not qualifying removals, not because they were after a predetermined cutoff date.

1.2.3.8 Source Characterization

Starmet contended that the HRS package contains numerous procedural errors and technical flaws in the site source characterization section. Starmet stated that the former Holding Basin, Source 1, and the Cooling Water Recharge Pond, Source 2, were incorrectly scored as surface impoundments, and that for Source 3, soil over much of the property was improperly identified as an area of contaminated soil. Starmet expressed concern that EPA's mischaracterization of the source areas at the site demonstrates complete lack of understanding of existing and readily available site data and exhibits an arbitrary and capricious selection of parameters for input into the HRS.

1.2.3.8.1 Source Hazardous Substances

Starmet noted that arsenic is listed as a contaminant at the Former Holding Basin, Source 1, because arsenic was detected at a low concentration in a sludge sample (sample number 44689). It also stated that the sludge was removed prior to the start of the "HRS process." Starmet contended that five background samples (BG-1 through BG-5) were analyzed for arsenic and the concentrations ranged from <13.8 ppm to 20.5 ppm, with an average concentration of 14.1 ppm. It commented that this concentration is consistent with MADEP's reported rural background average concentration for arsenic of 17 ppm. Starmet stated that 19 soil samples from the bottom of the basin were analyzed for arsenic, and "concentrations ranged from <13.0 ppm to 22.4 ppm with an average concentration of 18.7 ppm." It argued that the arsenic in soil at the former holding basin is representative of a background condition yet the HRS score improperly includes arsenic.

Starmet contested the use of sulfuric acid in the HRS scoring of the site. It maintained that sulfuric acid was included in the HRS documentation record because historical information indicates that it was used in the manufacturing process which generated the waste at the former holding basin, and because of an accidental spill in 1986. Starmet noted that all acids were neutralized prior to routine discharge to the Holding Basin, and following the sulfuric acid spill, ground water samples were collected approximately every other week for six months and no evidence of an impact was ever detected.

In response, the identification of arsenic and sulfuric acid associated with the holding basin is consistent with the HRS, although regulatory limits of certain hazardous substances were not exceeded in some of the samples collected. Section 2.2.2 of the HRS [51588], *Identify hazardous substances associated with a source,* states the following:

> For each of the three migration pathways, consider those hazardous substances documented in a source (for example, by sampling, labels, manifests, oral or written statements) to be associated with that source when evaluating each pathway.

This is the procedure the Agency followed in identifying substances associated with the NMI site. Arsenic is identified in Source 1 samples SB-5, SC-1C, and 44689 and Source 3 sample BG-3 (pages 21 and 31 of the HRS documentation record). Sulfuric acid has been documented to be associated with Source 1 by written statement from Starmet stating that it was spilled and by Starmet's own comments on the proposed listing of the NMI site, as said above (page 20 and 22 of the HRS documentation record; page 1-6 of Reference 43, *Nuclear Metals, Inc. Decommissioning Plan for the Holding Basin Revision 1*, of the HRS documentation record; page 7 of Reference 50, *Nuclear Metals, Inc. Site Characterization Report for the Holding Basin*, of the HRS documentation record).

The HRS does not require that a substance be detected at a particular concentration before it can be associated with a source. While concentrations of individual hazardous substances are not taken into consideration when associating hazardous substances within a source in HRS scoring, they are taken into consideration when assigning level of contamination to targets.

The concentrations at which these substances were detected in this source has no bearing on the site score. Actual representative concentrations will be determined when data are collected for the risk assessment. The purpose of the site assessment stage of the Superfund process is only to verify the presence of hazardous substances. EPA considers arsenic and sulfuric acid as accurately documented as present in Source 1. Furthermore, the inclusion of sulfuric acid has no bearing on the site score. It was included to describe what hazardous substances are associated with Source 1, the former holding basin. In the calculation of the HRS site score, the waste characteristics component of the ground water migration pathway is not based on the toxicity mobility of sulfuric acid or arsenic, and the waste characteristics component of the surface water migration pathway is also not based on the toxicity/persistence/bioaccumulation factor value of sulfuric acid or arsenic. Thus, even if these two hazardous substances are removed from the HRS documentation record, the site score remains unchanged (page 45 and 82 through 85 of the HRS documentation record).

1.2.3.8.2 Former Holding Basin, Source 1

Starmet commented on the sources type, the presence of ^{235}Uranium, and the hazardous waste quantity of the former holding basin.

Source Type

Starmet noted that the "listing package acknowledges remediation of the Holding Basin," but EPA did not factor this information into scoring the site. Starmet contended that as a result of the removal actions the former holding basin no longer meets the EPA definition of a surface impoundment and should now be classified as contaminated soil. Starmet commented that because of the removal action, the former holding basin which was a surface impoundment no longer exist at the site at the time of the HRS evaluation. Starmet noted "[h]owever, once the process sludge, and thus the surface impoundment, was removed, all that remained was the '**soil** onto which ... a hazardous substance was ... deposited.'"

Presence of ^{235}Uranium

Starmet contended that the analytical data for sample SB-8 from the Holding Basin (Source 1) did not detect ^{235}Uranium at a concentration of 12,000 ppm as stated in the HRS documentation record. According to Starmet, "[t]otal uranium was detected at a concentration of 12,000 ppm in sample SB-8, as reported in GZA's Phase III report (EPA [*R*]*eference 40*). U-235 is expected to occur in this sample at a small fraction of this value (0.2 - 0.7%)."

Hazardous Waste Quantity

Starmet commented that site-specific data included the volume of sludge and impacted soils, as well as the volumes removed as part of the removal action. According to Starmet, Tiers A, B, and C were not evaluated in the HRS hazardous waste quantity evaluation, and a less than accurate method, Tier D, was used. According to Starmet, there was sufficient information to evaluate Tier C, Volume, for the former Holding Basin. Starmet indicated that these errors result in a HWQ that is approximately 3 orders of magnitude too large.

In response, the former holding basin was appropriately characterized as a source for this site.

Source Type

Although EPA is aware of the removal action taken by Starmet, in evaluating these activities, EPA considered the guidelines in OSWER Directive 9345.1-03FS, *The Revised Hazard Ranking System: Evaluating Sites After Waste Removals*, October 1991, and OSWER Directive 9345.1-25, April 1997, *Revision to OSWER NPL Policy The Revised Hazard Ranking System: Evaluating Sites After Waste Removals, October 1991*. The requirements for consideration of a removal action were not met and, therefore, the removed waste is eligible to be counted in the hazardous waste quantity (HWQ) and be considered a surface impoundment. See Section 1.2.3.7, *Removal Activities*, of this support document for further discussion.

Moreover, hazardous substances are still present in the former holding basin area. As discussed below, uranium is still present in this source (Reference 89, Table 1, *Holding Basin Soil Characterization Study*, of the HRS documentation record at proposal). Uranium could potentially migrate to ground water and surface water and cause adverse effects on human health or the environment.

Even if Source 1 was evaluated as contaminated soil instead of as a surface impoundment, the site score would not be altered, only the source HWQ would be lowered, not the site HWQ used to calculate waste characteristics. (See the following subsection, Hazardous Waste Quantity, of this support document for an explanation).

Presence of ^{235}Uranium

Regarding Starmet's comment on the presence of ^{235}Uranium, "total uranium" was detected at a concentration of 12,000 ppm in sample SB-8, not ^{235}Uranium. EPA also notes that Starmet's own reference states that depleted uranium was detected in sample SB-8. Pages 6 to 7 of Reference 40 of the HRS documentation record, *Phase II Holding Basin RAM Completion Feasibility Study for Starment Corporation*, dated January 31, 1999, prepared for Starmet by its contractor GZA, states the following:

> Analysis of Holding Basin sludge and soils was conducted for depleted uranium, copper, and nitrate. Based on these analyses, depleted uranium, which is chiefly comprised of uranium-238 (U-238), appears to be the primary constituent which will drive remediation at the site. Depleted uranium (DU) is produced as a byproduct when U-235 (a highly fissionable isotope used to make weapons) is extracted from natural uranium ore. . . . For the soil borings conducted within the Holding Basin excavation, average DU concentrations ranged from 14 to 5,200 parts per million (ppm). Concentrations exceeding 1,000 ppm were generally encountered at soil boring locations on the western side of the excavation in borings HB-101, HB-307, HB-308, SB-3 and SB-8. *The highest DU concentration was detected in a surficial soil sample from boring SB-8, with a concentration of approximately 12,000 ppm* (emphasis added).

Thus, Starmet's own contractor's data confirm that depleted uranium was detected in sample SB-8 although total uranium includes other types of radioactive isotopes, including ^{238}Uranium. Moreover, naturally occurring uranium and depleted uranium both contain the same radioactive isotopes, except in different ratios. The *CRC Handbook of Chemistry and Physics* states that "[n]aturally occurring uranium normally contains 99.2830% ^{238}U, 0.7110% ^{235}U, and 0.0054% ^{234}U. Studies show that the percentage of ^{235}U in natural uranium varies by as much as 0.1%, depending on the source," and depleted uranium is "uranium with the percentage of ^{235}U lowered to about 0.2%" (Lide, 1990-1991, *CRC Handbook of Chemistry and Physics*, 71st Edition, page 4-36).

EPA notes that the HRS documentation record lists ^{235}Uranium as a hazardous substance in sample SB-8 of Source 1 (the Holding Basin). However, both ^{235}Uranium, as identified in depleted uranium, and ^{238}Uranium are assigned the same toxicity factor value, mobility factor value, ecosystem toxicity factor value, and ecosystem bioaccumulation factor value under the HRS (pages 44 and 84, HRS documentation

record). Thus, if either isotope is present, the site score remains unchanged. This comment has no impact on the HRS score.

Hazardous Waste Quantity

Regarding Starmet's comment on the hazardous waste quantity of the holding basin, EPA had insufficient and contradictory data regarding the dimensions of Source 1, the former holding basin. Therefore, the volume of Source 1 could not be accurately determined (page 23 of the HRS documentation record as proposed). Thus, EPA followed the prescribed guidelines set by the HRS in Section 2.4.2.1.3, *Volume,* which states: if the volume cannot be determined, assign the source a value of 0 for the volume measure and proceed to area. Since EPA had conflicting data about the dimensions of Source 1, the most conservative area measurement was used to calculate the source hazardous waste quantity for the holding basin (page 23 of the HRS documentation record).

1.2.3.8.3 Cooling Water Recharge Pond, Source 2

Starmet commented that the Cooling Water Recharge Pond, Source 2, should not be evaluated as a source. According to Starmet, Source 2 was never intended to be used as and was never used as a waste management area, nor was it used to dispose of any hazardous waste. Starmet also indicated that Source 2 was incorrectly identified as a surface impoundment.

Starmet claimed that the hazardous substances in the pond were a result of migration not deposition. Starmet maintained that the Cooling Water Recharge Pond was only intended for recharge of non-contact cooling water which consists only of ground water extracted from the subsurface, and that the non-contact cooling water was not intended to carry any waste. According to Starmet, the traces of contamination are associated with migration from other sources rather than from direct deposition of process waste, and small amounts of uranium and copper have migrated into the pond. Starmet noted that, for example, 30 gallons of liquid with depleted uranium leaked out of the holding basin and that it is critical to note that the cooling water recharge pond is down-gradient of the holding basin. Starmet also noted that copper is associated with uranium, and therefore, copper also likely migrated into the Cooling Water Recharge Pond from the Holding Basin. Starmet also maintained that the PAHs are petroleum regulated and not associated with processes at Starmet but are due to runoff from parking lots and an accidental release of 5 gallons of fuel oil in 1990. Starmet contended that PAHs which result from petroleum releases are exempt from CERCLA. It noted that all PAHs except benzo(a)pyrene were detected at concentrations below Risk Based Concentrations (RBCs), and no PAHs were detected in surface water samples from Source 2.

Starmet commented that other substances that may have entered the pond in non-contact cooling water are not associated with process waste and are only present in the cooling water because they migrated with the ground water to the supply wells from which the cooling water is pumped. Furthermore, Starmet noted that there are no data to support EPA's contention that chemicals found at concentrations above background in supply wells are present in the Cooling Water Recharge Pond. Starmet labeled this as "inferred contamination" because lab analyses of samples that were obtained from the Cooling Water Recharge Pond do not detect these compounds, and 50% of the compounds are VOCs and expected to

volatize from both the cooling water and the pond itself. Starmet commented further that some chemicals in the supply wells are not attributable to Starmet sources but have instead migrated from other properties in the area. Starmet indicated that chlorinated VOCs were detected during a ground water monitoring report on the 2250 Main Street property located across Main Street to the north of the Starmet site and that these data indicate that there is and has been a source of VOCs on the abutting 2250 Main Street property. Starmet noted that "[c]hlorinated VOCs persist in groundwater on the 2250 Main Street property, particularly at overburden wells OW-1 and MW-1, although significant concentrations of chlorinated VOCs have **not** been detected in overburden wells at upgradient locations (i.e., on the Starmet property) for a number of years." In addition, Starmet stated that the supply wells pump a significant amount of water and affect the direction of ground water flow in the area.

Starmet also argued that the uranium in the bedrock ground water is naturally occurring and not the depleted uranium used by Starmet in its manufacturing operations. It cited isotopic analyses in the Ground Water Monitoring Report for December 1999 as supporting that the uranium found in Source 2 is derived from migration of natural uranium in the bedrock and the migration of depleted uranium from atmospheric deposition and surface runoff. Furthermore, Starmet stated that, even though this information was available, "[t]his highly significant fact was not even mentioned in the HRS Package."

Starmet argued that because Source 2 was not designed to hold accumulated liquid wastes and the hazardous substances in Source 2 are a result of migration and not deposition, Source 2 is neither a surface impoundment nor a source.

In response, the identification of Source 2 at the NMI site is consistent with the HRS. HRS Section 1.1, *Definitions*, defines a source as:

> [a]ny area where a hazardous substance has been deposited, stored, disposed, or placed, plus those soils that have become contaminated from migration of a hazardous substance. Sources do not include those volumes of air, ground water, surface water, or surface water sediments that have become contaminated by migration. . . .

While the Cooling Water Recharge Pond may not have been originally intended to hold hazardous wastes, it ultimately ended up holding hazardous wastes and hazardous substances (pages 25 to 27 of the HRS documentation record). The hazardous substances present in Source 2 are a result of actions carried out by NMI. These hazardous substances would not be there if it were not for processes carried out by NMI. NMI pumped water from the supply wells and deposited the water in the Cooling Water Recharge Pond. It also appears that floor drains in the plant discharged to the cooling water recharge pond (Reference 65, page 2, 1996 *Supplemental Phase II Field Investigation*). Furthermore, Reference 77, page 21 indicates that the sump from the boiler room periodically discharged into Source 2 (the cooling water recharge pond). Also, Starmet noted that run-off from parking lots enters Source 2, and 30 gallons of liquid containing depleted uranium leaked out of the holding basin (Source 1), which is up-gradient of Source 2. These are possible causes of deposition and disposal of the hazardous substances present in Source 2. Thus, in addition to the recharge water, wastes from the boiler room sump, floor drains, spills, and parking lot run-off also entered Source 2.

Regarding the PAHs, the PAHs identified in Source 2 are not excluded under the CERCLA petroleum exclusion. Starmet did not demonstrate that the PAHs were only from the excluded petroleum. Starmet even claims that the PAHs in Source 2 could have resulted from driveways and parking and loading areas, where PAHs are commonly observed as non-point source pollution. Contamination caused by oil leaks from automobiles are not eligible for the CERCLA petroleum exclusion. See Section 1.2.3.6, *Petroleum Exclusion*, for discussion of this issue.

Regarding the VOCs, VOCs were used in various processes at the site, and Starmet's own contractor (GZA) speculated that the VOCs may have been discharged from former floor drains in the plant to the cooling water recharge pond (Reference 65, page 2, 1996 *Supplemental Phase II Field Investigation*). Regardless, VOCs are not the driving factors behind the waste characteristics score. Even if the VOCs were excluded from Source 2 and removed from the entire HRS documentation record, the site score would remain unchanged.

If both PAHs and VOCs were removed from the HRS evaluation, the site would still score 58.31.

Negating the contribution of the VOC and the PAH compounds to the HRS evaluation has no impact on the ground water pathway score because beryllium, manganese, ^{230}Thorium, and ^{232}Thorium are also used to calculate the toxicity/mobility value of the waste characteristics component of the ground water pathway score (HRS documentation record as proposed, page 44). These substances are used in calculating the waste characteristics pathway values, specifically, the chemical characteristics values.

For the surface water pathway, negating the contribution of the VOCs and the PAHs would reduce the waste characteristics assigned value from 320 to 180. However, the overall pathway score would remain unchanged. That is, the ecosystem toxicity/persistence factor value for ^{210}Lead and ^{226}Radium is 10,000, which, when multiplied by the hazardous waste quantity factor value of 100, yields an ecotoxicity/persistence/hazardous waste quantity factor value of 1,000,000. The bioaccumulation potential factor value for ^{210}Lead and ^{226}Radium is 5,000, which, when combined with the ecotoxicity/persistence/hazardous waste quantity factor value of 1,000,000, yields a toxicity/persistence/bioaccumulation factor value of 5,000,000,000 (5×10^9 or 5E+9) (HRS documentation record as proposed, pages 83 to 86). According to HRS Table 2-7, an ecotoxicity/persistence/hazardous waste quantity/bioaccumulation potential factor of 5×10^9 yields a waste characteristics factor category value of 180. Although this value is lower than the 320 assigned using benzo(a)anthracene or benzo(a)pyrene, the overall site score remains unchanged because when the waste characteristics of 180 is combined with the observed release assigned value of 550 and the targets assigned value of 300, an environmental threat score[3] of 60, the maximum, is still achieved (HRS documentation record, pages 7, 8, 81 to 86; HRS Tables 2-7, *Waste Characteristics Factor Category Values*, and 4-1, *Surface Water Overland/Flood Migration Component Scoresheet*).

[3]Calculation of the NMI environmental threat score: (550 x 180 x 300)/82,500 = 360. A maximum of 60 can be assigned for the environmental threat score (HRS Table 4-1)

With regard to the uranium being naturally occurring uranium from the bedrock and not the depleted uranium used by Starmet in its manufacturing processes, by Starmet's own admission, 30 gallons of liquid containing depleted uranium leaked from Source 1 (the former holding basin), which was up-gradient of Source 2. Although Starmet argues that the cooling water recharge pond is not a source because the hazardous substances within the pond migrated there as opposed to being deposited into the pond, Starmet's argument in and of itself upholds that hazardous substances are present in the cooling water recharge pond due to activity conducted by Starmet. As discussed previously, the hazardous substances were deposited into the cooling water recharge pond, and analytical samples provide evidence of the hazardous substances present. See Section 1.2.3.9.4, *Observed Release Attribution,* of this support document for further discussion.

1.2.3.8.4 Contaminated Soil, Source 3

Starmet noted that Source 3 has been estimated to occupy approximately 395,000 square feet in the HRS package. Starmet contended that within this area of contaminated soil, chemical concentrations reported for several of the samples cited in the HRS documentation record do not exceed background levels. Starmet recommended that these areas be eliminated from the source area in the HRS documentation record, resulting in a reduction of over 50 percent in the area of Source 3.

Starmet commented specifically on the PAHs in soil samples that it considered were detected at low levels indicative of background concentrations. Starmet claimed that these PAHs are "likely associated with atmospheric deposition of particulate matter from fossil fuel combustion."

Starmet also argued that EPA cited the presence of "arsenic in sample BG-3 as evidence that this location and this contaminant should be included in the ranking." Starmet noted that the concentrations of arsenic are consistent with MADEP's reported rural background average concentration for arsenic of 17 ppm. It also noted that copper was cited in samples BG-2 and BG-3 as evidence that these locations should be used in evaluating Source 3. Starmet commented that the concentrations of copper are well below both the urban and non-urban background concentrations cited by MADEP (170 ppm and 38 ppm). According to Starmet, samples BG-1 through BG-5 were collected in a historically undeveloped portion of the Starmet property, at a higher elevation than the buildings and process areas of the facility. Starmet stated that as described in GZA's work plan for the Phase II study (Reference 52 of the HRS documentation record at proposal), these samples were chosen specifically to provide information on background soil conditions. Starmet maintained that these samples should be considered background, and the area where these samples were taken should not be included in Source 3.

Starmet also contested samples GS-7, GS-10, GS-14, GS-15 and GS-16 used to show concentrations of beryllium. It commented that because the "range of beryllium concentrations in the on-site samples (GS-1 through GS-20) is within the background range, and the average beryllium concentration in the GS-series samples is lower than the average concentration in the background samples, the beryllium concentrations in the GS-series samples are consistent with background levels and should not be included as indicative of contaminated soil." Starmet asserted that because of this, the area encompassed by GS-7, GS-10, GS-14, GS-15, and GS-16 should not be included in the area for Source 3.

In response, Source 3 meets the HRS definition of a source (HRS Section 1.1, *Definitions*; page 31 of the HRS documentation record as proposed). Source 3, in this case, is soil that has become contaminated by the migration of hazardous substances. Analytical evidence documenting this contamination is presented on pages 31and 32, and Figure 4 of the HRS documentation record. Hazardous substances associated with Source 3 include benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, fluoranthene, indeno(1,2,3-cd)pyrene, phenanthrene, pyrene, arsenic, beryllium, copper, magnesium, molybdenum, uranium, ^{235}Uranium, and ^{238}Uranium (pages 31 and 32 of the HRS documentation record).

Regarding BG-1 through BG-5 being labeled as background samples in Reference 52 of the HRS documentation record, page 8 of Reference 52 states that five samples will be collected from undeveloped, upgradient portions of the property for analysis for copper, arsenic, titanium, and zirconium to provide information on background concentrations of these metals; however, no actual samples were listed in this reference.

Even if EPA removed BG-1, BG-2, BG-3, BG-5, GS-7, GS-10, GS-14, GS-15, GS-16 and the PAHs from the area of contaminated soil, the site score would remained unchanged. Beryllium is still detected in soil samples GR-3, OF-2, OF-1, and DR-4; copper is detected in soil samples GZ-203, OF-3, GR-3, GZ-207, and OF-2; magnesium is detected in soil sample DL-2; uranium is detected in soil sample GR-3; and ^{235}uranium and ^{238}uranium are detected in sample 18 (pages 31 and 32 of the HRS documentation record). These samples and hazardous substances found in them would be sufficient to delineate an area of contaminated soil. While the source hazardous waste quantity (HWQ) value may be lower, the ground water pathway hazardous waste quantity and the surface water pathway hazardous waste quantity would remain unchanged (pages 4, 7, 8, 33 to 35, 45, 66, and 74 to 75 of the HRS documentation record). Accordingly, the hazardous waste quantity value for the surface water pathway and the ground water pathway would remain unchanged because the default value of 100 would still apply (HRS Section 2.4.2.2, *Calculation of hazardous waste quantity factor value).* Also, the waste characteristics assigned value would remain unchanged because, as stated above, the hazardous substances identified in samples BG-1, BG-2, BG-3, BG-5, GS-7, GS-10, GS-14, GS-15, and GS-16 are also found in other samples at the site.

1.2.3.9 Ground Water Migration Pathway

Comments submitted by Starmet concerning the evaluation of the ground water migration pathway address the waste characteristics, the observed release, and the targets components of the HRS evaluation.

1.2.3.9.1 Waste Characteristics: Beryllium Toxicity

Starmet contended that obsolete data on beryllium toxicity from *Superfund Chemical Data Matrix* (SCDM) was used to evaluate its relative risk. According to Starmet, the SCDM toxicity factor value for beryllium does not reflect EPA's more recent beryllium toxicity data.

Starmet stated:

> In April, 1998, EPA published the final version of the *Toxicological Review of Beryllium and Compounds - In Support of Summary [I]nformation on the Integrated Risk Information System (IRIS)*. The authors of this document reviewed the data pertaining to the carcinogenicity of beryllium via the oral route and concluded that the 'oral animal studies did not find statistically significant increases in tumors upon ingestion of beryllium sulfate.' Accordingly, EPA withdrew the oral cancer slope factor for beryllium from the IRIS record on April 4, 1998. Thus, EPA revised its overall representation of the potential toxicity of beryllium, specifying that potential oral carcinogenicity **should no longer be used** to characterize the toxicity of this metal.

In response, Starmet is correct that IRIS no longer has an oral slope factor for beryllium. However, the toxicity factor value for beryllium remains unchanged when one considers that IRIS also revised the oral reference dose, the inhalation reference concentration, and the carcinogenicity assessment (weight-of-evidence) in April 1998 to 2×10^{-3} mg/kg-day, 2×10^{-2} μg/m^3, and B1, respectively (*Toxicological Review of Beryllium and Compounds - In Support of Summary Information on the Integrated Risk Information System (IRIS)* and IRIS Substance File - Beryllium and compounds, accessed online via EPA website www.epa.gov/iris on 11/10/2000). The HRS human toxicity assigned factor value remains 10,000, as assigned in the 1996 version of SCDM and as used in the HRS evaluation of the NMI site. As explained below, the HRS contains procedures for assigning a toxicity factor value when an oral reference dose is not available.

HRS Section 2.4.1.1, *Toxicity factor*, states the following:

> assign human toxicity factor values to a hazardous substance using Table 2-4, as follows: If RfD and slope factors values are both available for the hazardous substance, assign the substance a value from Table 2-4 for each. Select the higher of the two values assigned and use it as the overall toxicity factor value for the hazardous substance.

The HRS Section 2.4.1.1 further adds that "[f]or hazardous substances having usable toxicity data for multiple exposure routes (for example inhalation and ingestion), *consider all exposure routes and use the highest assigned value, regardless of exposure route*, as the toxicity factor value" (emphasis added).

Considering the revised value for the oral reference dose, 2×10^{-3} mg/kg-day, and using HRS Table 2-4, *Toxicity Factor Evaluation*, a human toxicity factor value of 1,000 would be assigned for beryllium.

Using the IRIS inhalation reference concentration of 2×10^{-2} μg/m^3 and the directions in Section 2.2.1, *Reference Dose (RfD)-Oral, Inhalation*, of *Superfund Chemical Data Matrix*, an inhalation reference dose can be calculated for beryllium. SCDM Section 2.2.1 states the following:

> Inhalation data in IRIS are given as reference concentrations (RfCs) equivalent to dose rather than RfDs. RfCs are converted to RfDs by the following equation:

$$RfD = \frac{RfC \times IR \times AR}{BW \times 100} \qquad (1)$$

Where:

RfC = Reference concentration in air (mg/m^3)
IR = Inhalation rate (20 m^3/day)
AR[4] = Absorption rate (%)
BW = Adult body weight (70 kg).

Using the default exposure assumptions listed above, Equation (1) may be simplified as:

$$RfD_{inhal}\ mg/kg\text{-}day = RfC_{inhal} \times AR \times 2.857 \times 10^{-3} \qquad (2)$$

Thus, the calculated $RfD_{inhalation}$ for beryllium is 5.7×10^{-6} mg/kg-day. That is: (A) 2×10^{-2} $\mu g/m^3$ is equal to 2×10^{-5} mg/m^3 and (B) 2×10^{-5} mg/m^3 x 100 x 2.857×10^{-3} = 5.7×10^{-6} mg/kg-day

An $RfD_{inhalation}$ of 5.7×10^{-6} mg/kg-day yields a human toxicity factor value of 10,000, the maximum human toxicity factor value that can be assigned under the HRS, when applied in HRS Table 2-4.

Considering that IRIS has revised the human carcinogenicity assessment of beryllium to a B1 classification (probable human carcinogen (limited human data)), and that a slope factor for beryllium can be calculated using the inhalation unit risk factor (2.4×10^{-2} $\mu g/m^3$) provided in IRIS and the directions provided in Section 2.3.1, *Cancer Slope Factor (SF) and Weight of Evidence-Oral, Inhalation* of *Superfund Chemical Data Matrix*, a human toxicity factor value for beryllium can also be assigned using HRS Table 2-4. Section 2.3.1 of SCDM states the following:

> Data in IRIS for inhalation are given as unit risk factors (URFs) which are related to cancer slope factors by the following equation (used for nonradionuclides only):
>
> $$SF_{inhal} = \frac{URF \times BW \times CF \times 100}{IR \times AR} \qquad (3)$$
>
> Where:
>
> SF = Cancer slope factor $(mg/kg\text{-}day)^{-1}$
> URF = Unit risk factor $(\mu g/m^3)^{-1}$
> BW = Adult body weight (70 kg)
> CF = Conversion factor (1,000 μg/mg)
> IR = Inhalation rate (20 m^3/day)
> AR[5] = Absorption rate (%)

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[4]An absorption rate of 100 percent is assumed if IRIS does not provide an absorption rate, as is the case with beryllium.

[5]An absorption rate of 100 percent is assumed if IRIS does not provide an absorption rate, as is the case with beryllium.

Using the assumptions listed above reduces Equation (3) to the following equation:

$$SF_{inhal}\ (mg/kg\text{-}day)^{-1} = \frac{URF \times 3.5 \times 10^5}{AR} \qquad (4)$$

Thus the calculated slope factor for beryllium is 8.4 $(mg/kg\text{-}day)^{-1}$. That is, $(2.4 \times 10^{-3}\ \mu g/m^3 \times 3.5 \times 10^{-5}) \div 100 = 8.4\ (mg/kg\text{-}day)^{-1}$. This value is the same value that is provided in the 1996 publication of SCDM because the inhalation unit risk factor was not revised in IRIS. Instead, IRIS stated the following: "Rather than calculate an interim quantitative estimate based on Ward et. al (1992) data and poorly defined exposure estimates, it is recommended that the existing unit risk based on the Wagoner et al. (1980) study be retained until the NIOSH assessment can be evaluated for quantitative estimate" (IRIS, Section II.C of Beryllium and Compounds, accessed online November 2, 2000).

An inhalation slope factor of 8.4 $(mg/kg\text{-}day)^{-1}$ and a B1 weight-of-evidence human carcinogenicity characterization yield a human toxicity assigned factor value of 10,000 using HRS Table 2-4.

Thus, although the commenter is correct that the toxicity assessment of beryllium has been revised in IRIS in April of 1998, the revisions have not impacted the HRS human toxicity factor value assigned to beryllium. The HRS requires, as cited above, that both the RfD and the slope factor be considered when assigning the human toxicity factor value from HRS Table 2-4 and then the higher of the two values is selected as the overall toxicity factor value. Using either the slope factor/weight-of-evidence combination or the inhalation reference dose, an HRS toxicity factor value of 10,000 remains as the assigned value for beryllium.

Overall, Starmet failed to recognize that in this case, the only beryllium toxicity value that was revised in IRIS such that a lesser HRS human toxicity factor value for beryllium may have been assigned is the oral reference dose for beryllium. However, because the IRIS inhalation reference concentration was actually made more stringent and because the IRIS revision in the weight-of-evidence together with no change in the IRIS inhalation unit risk factor, a human toxicity factor value of 10,000 remains as the assigned value from HRS Table 2-4. This is the same value assigned in the 1996 SCDM publication and is the value used in the HRS evaluation of the ground water pathway score.

1.2.3.9.2 Observed Release Significant Increase

Starmet contended that the ground water observed release concentrations of manganese, thorium, and uranium are within naturally occurring background levels.

Manganese

Starmet contended that manganese should not be included as a ground water contaminant for this site because manganese is present only at background concentrations. According to Starmet, "the HRS scoring for manganese is based on an erroneous and artificially low value for background and is thus not reliable." Starmet stated that the HRS package only considered the concentration of manganese in well GZW-5 collected in April of 1998. Starmet added that it is inappropriate to use a single value for

establishing background concentration when multiple results are available. According to Starmet, the manganese concentration in well GZW-5 from October 1993 to April 1998 ranges from nondetect to 0.3890 ppm with an average manganese concentration in well GZW-5 at 0.0615 ppm. Starmet, thus, contended that the observed release of manganese in sample SW-2A is at a concentration of 0.084 ppm, which is not three times greater than the average background concentration of 0.0615 ppm.

Thorium

Starmet contended that the levels of thorium detected are consistent with background levels associated with the presence of natural uranium and thorium in rock and soils. According to Starmet, thorium is generally more than three times as abundant as uranium and ranges from 1.6 to 20 ppm in rock, averaging about 10 ppm in soil. Starmet also commented that the thorium isotopes referenced by EPA (^{228}thorium, ^{230}thorium, ^{232}thorium) are not decay products of the uranium isotopes used at the site. Starmet added that:

> The EPA scoring of Thorium refers to several isotopes of Thorium: Th-228, Th-230, and Th-232. Thorium 232 is the parent isotope of the natural decay series, and is the ultimate source of the Th-228 observed in the environment. Although Th-228 and Th-232 are also decay products of uranium isotopes U-236 and U-232, these isotopes of uranium are not naturally occurring. They are produced only in reactors and accelerators, **are not components of depleted or natural refined uranium, and are not associated with the site.**

Starmet also commented that ^{230}Thorium is a natural product of the decay of ^{234}Uranium, and that the ^{230}Thorium concentrations detected at the site are from the decay of naturally occurring ^{234}Uranium which has existed in rocks at the site for millions of years. Starmet also commented that EPA's description of thorium as a derivative of ^{232}Uranium and ^{236}Uranium shows EPA's lack of understanding or disregard for the natural presence and distribution of thorium in the environment.

Uranium

Starmet contended that the uranium present in the bedrock ground water is at background concentrations, is naturally occurring, and is not depleted uranium. According to Starmet, the isotopic distribution of the uranium detected in bedrock ground water is not the depleted uranium used at the NMI site. Starmet stated that the GZA report describing the December 1999 sampling, submitted to DEP in April 2000, discusses this issue, and that this highly significant information was omitted in the HRS package.

Additional comments by Starmet stated that background uranium may be distinguished from artificial depleted uranium by measuring the distribution of ^{234}Uranium, ^{235}Uranium, and ^{238}Uranium. According to Starmet, natural uranium is observed in ground water with ^{234}uranium activity concentrations equal to or greater than the corresponding ^{238}uranium values. In contrast, stated Starmet, ^{238}uranium dominates the activity distribution in depleted uranium, a characteristic that is maintained (over the human scale of events) as depleted uranium migrates through ground water. Starmet contended that:

> Evaluation of the ratio of uranium isotopes determined by isotopic analysis can be used to assess whether uranium is naturally occurring or is the result of Starmet's operations. . . .The isotopic ratios presented on Table 6 indicate that the average activity ratio of U-

> 238 to U-234 ranges from 7.00 to 7.82 in groundwater samples from holding basin area overburden monitoring wells HB-12, GZW-7-1, HBPZ-2, and HBPZ-4. These monitoring wells clearly characterize the DU [depleted uranium] impacts at the site. In contrast, the ratios of U-238 to U-234 in samples from bedrock wells SW-2A, GZW-7-2, GZW-10, and GZW-11 range from 0.463 to 0.953 which clearly is indicative of naturally occurring uranium.

Starmet also stated that the difference between depleted uranium and naturally occurring uranium is also emphasized by the contrast in activity between depleted uranium and ^{230}Thorium in the sludge which was removed from the site in 1997-1998. According to Starmet, ^{230}Thorium, which is a natural decay product of ^{234}Uranium and ultimately ^{238}Uranium, is present at only 2.5 - 8.8 pCi/g, compared to the occurrence of depleted uranium at 20,000 to 30,000 pCi/g. Starmet stated that this observance reinforces that the source of ^{230}Thorium is not anthropogenic.

In response, the HRS documentation record has appropriately selected samples from monitoring well GZW-5 as representative of the site-specific background level for the ground water release substances. Although the HRS does not provide specific directions in selecting background levels, well GZW-5 was chosen as a background well because it (1) is located upslope and hydrologically upgradient of the on-site sources; (2) is within the same overburden/bedrock interconnected aquifer; and (3) is not in an area of known contamination (page 38 of the HRS documentation record). Thus, the concentrations of the observed release hazardous substances, including uranium, thorium, uranium isotopes, and thorium isotopes, are appropriately compared to site-related levels of these hazardous substances within the vicinity of the site as is represented by the analytical data from well GZW-5 (page 39 of the HRS documentation record). With specific regard to Starmet's comments regarding the isotopic ratio of depleted uranium versus that of naturally occurring uranium, the evaluation of isotopic ratios are beyond the scope of the HRS which is a screening tool. The observed release hazardous substances were detected at a significant increase above the background level (pages 39 to 41 of the HRS documentation record).

Manganese

Regarding Starmet's comment on data for manganese prior to 1998, the April 1998 background for manganese in well GZW-5 was appropriately used for comparison to the April 1998 observed release of manganese in well SW-2A. Although it may be desirable to use several samples, it is more appropriate to use samples that are similar. Because the concentrations of hazardous substances may change over time, when comparing substances that are naturally occurring in the environment, a release of a hazardous substance is best compared to a background concentration that is collected within an appropriate time frame and under similar environmental conditions as the release sample in order that an observed release is properly documented. The samples collected in 1993 through 1997 could not document an observed release for manganese in 1993 through 1997. However, the sample collected in 1998 documented a significant increase of manganese in 1998 (HRS Section 2.3, *Likelihood of release*).

Thorium, Uranium

Regarding Starmet's comment that the radioactive isotopes of thorium and uranium detected at the site are within naturally occurring background levels and are not associated with activity at the site, EPA

finds that the observed release radioactive isotopes are 2 standard deviations above the mean site-specific background level, and the observed release substances are attributable to the NMI site.

Contrary to Starmet's comments, a site-specific background can be used to document an observed release of naturally occurring radionuclide (HRS Section 7.1.1, *Observed release/observed contamination*). As stated above, samples from monitoring well GZW-5 were used to establish site-specific background levels. The HRS documentation record documents the site-specific background concentration for radioactive isotopes ^{228}Thorium, ^{230}Thorium, and ^{232}Thorium in well GZW-5 (pages 38 and 39 of the HRS documentation record). The observed releases of the radionuclides were evaluated according to the directions in HRS Section 7.1.1 as detailed below. See also Section 1.2.3.9.4, *Observed Release Attribution*, of this support document for further discussion.

HRS Section 7.1.1, *Observed release/observed contamination*, states the following:

> For radionuclides that occur naturally and for radionuclides that are ubiquitous in the environment:
>
> > Measured concentrations (in units of activity, for example, pCi per kilogram [pCi/kg], pCi per liter [pCi/l], pCi per cubic meter [pCi/m^3]) of a given radionuclide in the sample are at a level that:
> >
> > > Equals or exceeds a value *2 standard deviations above the mean site-specific background* for that radionuclide in that type of sample, *or* Exceeds the upper-limit value of the range of regional background concentration values for that specific radionuclide in that type of sample (emphasis added).

The HRS documentation record documents an observed release of radioactive isotopes ^{228}Thorium, ^{230}Thorium, and ^{232}Thorium because as listed below, the concentrations of ^{228}Thorium, ^{230}Thorium, and ^{232}Thorium exceed 2 standard deviations above the mean site-specific background (pages 39 to 41 of the HRS documentation record):

- Observed release of ^{228}Thorium at a concentration of 3.45 $\pm$ 0.3 pCi/L in well ML-1-3 with a background concentration of 0.062 $\pm$ 0.185 pCi/L in well GZW-5

  Two standard deviations of the background concentration is 0.37.

  With a background of 0.062 $\pm$ 0.185 pCi/L, the observed release concentration must be at least 0.617 pCi/L to be eligible for HRS evaluation.

  The observed release of 3.45 $\pm$ 0.3 pCi/L is well above 0.617 pCi/L.

- Observed release of ^{230}Thorium at a concentration of 2.83 $\pm$ 0.263 pCi/L in well ML-1-3 with a background concentration of 0.324 $\pm$ 0.156 pCi/L in well GZW-5

Two standard deviations of the background concentration is 0.312.

With a background concentration high of 0.324 ± 0.156 pCi/L, the observed release concentration must be at least 0.792 pCi/L to be eligible for HRS evaluation.

The observed release 2.83 ± 0.263 pCi/L is well above 0.792 pCi/L. Thus, the concentration of ^{230}Thorium in well ML-1-3 meets the observed release criteria.

- Observed release of ^{232}Thorium at a concentration of 3 ± 0.266 pCi/L in well ML-1-3 with a background concentration of 0.015 ± 0.031 pCi/L in well GZW-5

  Two standard deviations of the background concentration is 0.062.

  With a background concentration of 0.015 ± 0.031 pCi/L, the observed release concentration must be at least 0.108 pCi/L to be eligible for HRS evaluation.

  The observed release of 3 ± 0.266 pCi/L is well above 0.108 pCi/L. Thus, the concentration of ^{232}Thorium in well ML-1-3 meets the observed release criteria.

- Observed release of ^{232}Thorium at a concentration of 0.432 ± 0.107 pCi/L in well HB-10 with a background concentration of 0.015 ± 0.031 pCi/L in well GZW-5

  Two standard deviations of the background concentration is 0.062.

  With a background concentration of 0.015 ± 0.031 pCi/L, the observed release concentration must be at least 0.108 pCi/L to be eligible for HRS evaluation.

  The observed release 0.432 ± 0.107 pCi/L is well above 0.108 pCi/L. Thus, the concentration of ^{232}Thorium in well HB-10 meets the observed release criteria.

- Observed release of ^{232}Thorium at a concentration of 0.572 ± 0.106 pCi/L in well ML-3-3 with a background concentration of 0.015 ± 0.031 pCi/L in well GZW-5

  Two standard deviations of the background concentration is 0.062.

  With a background concentration of 0.015 ± 0.031, the observed release concentration must be at least 0.108 pCi/L to be eligible for HRS evaluation.

  The observed release of 0.572 ± 0.106 pCi/L is well above 0.108 pCi/L. Thus, the concentration of ^{232}Thorium in well ML-3-3 meets the observed release criteria.

- Observed release of ^{232}Thorium at a concentration of 0.385 ± 0.089 in well ML-3-1 with a background concentration of 0.015 ± 0.031 pCi/L in well GZW-5.

  Two standard deviations of the background concentration is 0.062.

With a background concentration high of 0.015 ± 0.031 pCi/L, the observed release concentration must be at least 0.108 pCi/L to be eligible for HRS evaluation.

The observed release of 0.385 ± 0.089 pCi/L is well above 0.108 pCi/L. Thus, the concentration of ^{232}Thorium in well ML-3-1 meets the observed release criteria.

1.2.3.9.3 Single Observed Release and Concentrations Below Regulatory Limits

Starmet contended that EPA included compounds whose available analytical data indicate that they are present in so few samples as to be insignificant and represent laboratory artifacts. Citing the *Risk Assessment Guidelines for Superfund Sites,* Starmet stated that based on the extremely low frequency of detection and the low concentration detected relative to laboratory detection limits, vinyl chloride, carbon disulfide, beryllium, and molybdenum should not be included in the list of site-related ground water contaminants. Starmet stated the following:

> Section 5.9 of EPA's Risk Assessment Guidance [sic] (RAGS, EPA, OERR, December 1989) describes criteria that can be used to reduce the number of chemicals potentially assessed, and hence focuses risk assessments on the **appropriate** chemicals of concern (COCs). One of the criteria which can be listed to select COCs is the frequency of detection (FOD), since the chemicals which are infrequently detected may be artifacts in the data due to sampling, analytical, or other problems, and therefore may not be related to site operations or disposal practices. A FOD limit of 5% in a medium specific data set consisting of at least 20 samples is provided as an example. That is, if 100 samples were collected in a single medium, and there were only 2 detects for a particular compound, the FOD would be 2% and the chemical would be a candidate for elimination. **Based on the extremely low frequency of detection of the compounds listed above (well below 5%), and the low concentration(s) detected (relative to detection limits), vinyl chloride, carbon disulfide, beryllium, and molybdenum should not be included in the list of Site-related groundwater contaminants.**

According to Starmet, when said substances are properly excluded from the HRS package, the highest toxicity value is only 100, which is associated with the introduced uranium at the site. The following comments address specific compounds whose observed release are challenged by Starmet:

Vinyl Chloride

Starmet contended that vinyl chloride was detected in one sampling round in well WP-2 at a concentration of 2.7 parts per billion (ppb). Starmet added that vinyl chloride was not detected in other sampling rounds at this well or at any other location. According to Starmet the HRS score improperly include vinyl chloride.

Carbon Disulfide

Starmet contended that the HRS score improperly includes carbon disulfide. According to Starmet,

carbon disulfide was detected once at a concentration of 26 ppb in a sample collected from monitoring well PW-8. Starmet added that carbon disulfide was not detected in the other five samples collected from this well and the detected concentration is below the EPA Region 3 tap water Risk Based Concentration (RBC) of 1,000 ppb.

Beryllium

Starmet contended that beryllium was detected only twice at concentrations representative of background levels. According to Starmet, beryllium was detected once at the detection limit of 0.003 parts per million (ppm) in a sample from PW-3 in 1995, and then once in 1997 from monitoring well P-1 at a concentration of 0.003, slightly above its detection limit of 0.002 ppm. Starmet added that both of these concentrations are below the EPA Region 3 tap water RBC of 0.083 ppm and the Federal maximum contaminant level (MCL) of 0.004 ppm.

Starmet also commented that it has not been a source of beryllium contamination to ground water and the data clearly indicated that. According to Starmet, beryllium was not detected in the other 85 samples; monitoring well P-1 was analyzed for beryllium ten times, yet beryllium was detected only once; well P-1 is the furthest down gradient well from the Starmet buildings, former holding basin, and the cooling water recharge pond; and beryllium was not detected in wells between P-1 and the Starmet property. NMI contended that the HRS score improperly includes beryllium.

Molybdenum

Starmet contended that molybdenum was improperly included in the HRS score. According to Starmet the concentration of molybdenum in sample HB-8 of October 1994 was "only" 0.025 ppm which is below the EPA Region 3 tap water risk based concentration of 0.180 ppm.

In response, the observed releases of the above identified non-radioactive hazardous substances to ground water are evaluated in accordance to the requirement of HRS Section 2.3. According to HRS Section 2.3, *Likelihood of release*, "[t]he minimum standard to establish an observed release by chemical analysis is analytical evidence of a hazardous substance in the media significantly above the background level. Further, some portion of the release must be attributable to the site." HRS Table 2-3, *Observed Release Criteria for Chemical Analysis*, further explains an observed release by chemical analysis. HRS Table 2-3 states the following:

> An observed release is established as follows:
>
> > If the background concentration is not detected (or is less than the detection limit), and observed release is established when the sample measurement equals or exceeds the sample quantitation limit.
> >
> > If the background concentration equals or exceeds the detection limit, an observed release is established when the sample measurement is 3 times or more above the background concentration.

The following hazardous substances, which Starmet agrees were detected in ground water samples, were appropriately included as observed release substances to ground water (page 41 of the HRS documentation record):

- Vinyl chloride was detected in sample WP-2 at a concentration of 2.7 ppb, with a background level of nondetect and an SQL of 2 ppb.

- Carbon disulfide was detected in sample PW-8 at a concentration of 5.5 ppb, with a background level of nondetect and an SQL of 2 ppb.

- Beryllium was detected in sample P-1 at a concentration of 0.003 picoCuries per liter, with a background level of nondetect and an SQL of 0.002 picoCuries per liter.

- Molybdenum was detected in sample HB-8 at a concentration of 0.025 picoCuries per liter, with a background level of nondetect and an SQL of 0.02 picoCuries per liter.

A misconception of Starmet is that an observed release of a hazardous substance must be found in a certain percentage of samples. Contrary to that, there is no such requirement under the HRS. The use of *Risk Assessment Guidelines for Superfund Sites* is also not applicable to HRS scoring. Rather, Section 2.3 of the HRS, *Likelihood of release,* states that an observed release has occurred if a contaminant is measured significantly above background and if some portion of the release is attributable to the site. A trend need not be established (49 FR 37078, September 21, 1984). Thus, other data showing the absence of a release do not necessarily refute the earlier data used to assign a value for an observed release because many releases vary in concentration through time or occur sporadically. The courts have upheld EPA's interpretation on this point (see City of Stoughton v. E.P.A., 858 F.2d 747, 756 (D.C. Cir. 1988)).

Regarding Starmet's comment that beryllium, carbon disulfide, molybdenum, and vinyl chloride are below the risk based concentrations, on July 16, 1982, when responding to public comments on the proposed (original) HRS (47 FR 31188), and again on September 8, 1983 (48 FR 40665), the Agency rejected the idea that releases within regulatory limits should not be considered "observed releases" under the HRS. As the Agency noted in 1982:

> emission or effluent limits do not necessarily represent levels which cause no harm to public health or the environment. These limitations are frequently established on the basis of economic impacts or achievability.

By contrast, an observed release represents a 100 percent likelihood that substances can migrate from the site (47 FR 31188, July 16, 1982).

Section 2.3 of the revised HRS, *Likelihood of release,* states that an observed release can be established either by direct observation or by chemical analysis. An observed release by chemical analysis has occurred when a contaminant is measured significantly above background level if some portion of the release is attributable to the site. Even though levels may be lower than regulatory limits, an observed release has nevertheless occurred if the measured levels are significantly higher than background levels.

The HRS does, however, consider whether releases are above regulatory limits in evaluating target populations, increasing by a factor of 10 the weight assigned populations exposed to contaminants above certain health-based or ecological benchmarks.

Of course, the observed release factor alone is not intended to reflect the hazard presented by the particular release. Instead, the hazard of the site is approximated by the total HRS score, which incorporates the observed release factors with other factors such as waste characteristics (including waste quantity, toxicity, and persistence) and targets. This total HRS score reflects the hazard of the site relative only to the other sites that have been scored. The actual degree of contamination and its effects are more fully determined during the Remedial Investigation that typically follows listing.

1.2.3.9.4 Observed Release Attribution

Starmet contended that all the hazardous substances detected in the ground water supply wells are not attributable to the site. According to Starmet, the statement in the documentation record, that there are no alternative anthropogenic sources of hazardous substance contamination in ground water wells SW-1 or SW-2A, is not true because several annual ground water monitoring reports prepared for Starmet have identified a separate source of chlorinated volatile organic compounds (VOCs) on the property at 2250 Main Street, which is across Rt. 62 just north of the NMI site. Starmet also stated that the HRS documentation record indicates in Section 3.1 that the NMI site is located in a mixed residential area. Starmet then commented that according to the Town of Concord, the site and abutting properties to the west and south are zoned as limited industrial park.

Starmet also contended that the isotopes of uranium and thorium referenced by EPA are not decay products of uranium used at the site. Starmet added that the isotopic distribution of the uranium detected in bedrock ground water is not that of the depleted uranium used at the NMI site. Starmet stated that the GZA report describing the December 1999 sampling, submitted to DEP in April 2000, discusses this issue, and that this highly significant information was omitted in the HRS package.

In response, the HRS documentation record at proposal has appropriately attributed the release of hazardous substances to the operations at the NMI site because there is sufficient information that the release is at least partially attributable to the NMI site (pages ii, 38 to 42, and 55 to 62 of the HRS documentation record as proposed). According to HRS Section 2.3, *Likelihood of release*, "[t]he minimum standard to establish an observed release by chemical analysis is analytical evidence of a hazardous substance in the media significantly above background level. Further, *some portion* of the release is attributable to the site" (emphasis added).

Operations at the Starmet facility have used solvents containing VOCs, and VOC contamination in on-site wells SW-1 and SW-2[6] has been identified at least since 1980 (pages 4 and 10 of Reference 49 of the

[6]Well SW-2 was replaced by Well SW-2A in 1987 (Figure 5 of the HRS documentation record; Table 1 of Reference 67 of the HRS documentation record).

HRS documentation record; page 5 of Reference 66 of the HRS documentation record). The HRS documentation record also states on page 18, which Starmet does not contest, that several other potential sources exist at the site, one of which is an on-site septic system. VOC contamination has been identified in this septic system. Page 18 of the HRS documentation record states the following:

> Roy Weston, Inc, reported that liquids washed from surfaces within the facility often 'ended up' in the septic system. GZA sampled the liquid from Septic Tank 1 (ST1) and Septic Tank 2 (ST2) from the on-site septic system. Laboratory data identified the presence of acetone; 2-butanone, carbon disulfide, chlorobenzene, 1,1-dichloroethane, ethylbenzene, methylene chloride, titanium, toluene, 1,1,1-trichloroethane, 1,2,4-trimethyl, 1,3,5-trimethylbenzene, o- and p-xylene, and copper in samples collected from ST1 and ST2.

Thus, although Starmet contests the attribution of VOC contamination in the ground water wells, it does not deny that the facility used solvents containing VOC, and that contamination has been documented on-site. Further, although it may be possible that there are other sources of VOC contamination, the HRS only requires partial attribution of a hazardous substance to the site. As discussed, there is sufficient information to associate the NMI site with at least *some portion* of the VOC contamination in wells SW-1, SW-2, and SW-2A.

Whether the site location is designated a limited industrial park has no bearing on this listing. The HRS has no provisions to score sites located in limited industrial areas differently from sites located in mixed residential areas. With specific regard to Starmet's comment that the property at 2250 Main Street, which is across Rt. 62 just north of the NMI site, is a potentially responsible party for the contamination of VOCs in wells SW-1 and SW-2A, listing a site does not involve determinations as to who is the responsible party. As discussed in Section 1.2.3.4 of this support document, liability is not considered in evaluating a site under the HRS. Moreover, a *Phase I Limited Site Investigation* for the property at 2250 Main Street reported no evidence of past use or storage of hazardous material at this location (pages 20 and 21 of Reference 67 of the HRS documentation record at proposal). Although a 550 gallon oil tank was discovered and subsequently removed, there was no release of fuel oil. Thus, a source of VOC contamination at the 2250 Main Street property has not been identified. Additionally, even if another source of VOCs is discovered during the RI/FS, EPA notes that the extent of the site as described at listing is subject to change; the site may be expanded during later stages of the remediation process to include other areas of contamination where the released contamination has come to be located. It may also be expanded to include hazardous waste sources, if identified, as well as to include other contaminant releases discovered while exploring the extent of, or undertaking the remediation of, the listed releases. The extent of the site might also be reduced if it is determined that the identified areas do not pose a significant threat to human health or the environment. In addition, if another, unrelated area of contamination is discovered elsewhere on the property, EPA may decide to evaluate that release for the NPL. CERCLA Section 105(a)(8)(A) requires EPA to list national priorities among the known "releases or threatened releases" of hazardous substances; thus, the focus is on the release, not precisely delineated boundaries.

Concerning Starmet's comment on the ratio of the observed release of ^{228}Thorium, ^{230}Thorium, and ^{232}Thorium in monitoring wells ML-1-3, ML-3-1, and ML-3-3 at the site, it is beyond the scope of the site

inspection (SI) to determine the ratios of radioactive isotopes that are expected from the decay of naturally occurring uranium in bedrock in the aquifer as compared to the ratio of the radioactive isotopes resulting from the uranium and depleted uranium used at the site. Further, site history indicates that activities at the Starmet facility used natural and depleted uranium, thorium, and thorium oxides to manufacture various products, and wastes from those processes were disposed of on-site (page ii, 17 to 21, 25, and 30 of the HRS documentation record). ^{228}Thorium, ^{230}Thorium, and ^{232}Thorium are all decay products of depleted uranium and naturally occurring uranium, which were both used at the site (References 85, 86 and 87 of the HRS documentation record; page ii of HRS documentation record). "Naturally occurring uranium normally contains 99.2830% ^{238}U, 0.7110% ^{235}U, and 0.0054% ^{234}U. Studies show that the percentage of ^{235}U in natural uranium varies by as much as 0.1%, depending on the source." (Lide, 1990-1991, *CRC Handbook of Chemistry and Physics*, 71st Edition, page 4-36). Depleted uranium is defined as "uranium with the percentage of ^{235}U lowered to about 0.2%" (Lide, 1990-1991, *CRC Handbook of Chemistry and Physics*, 71st Edition, page 4-36). Starmet's report, *Groundwater Monitoring Report, December 1999*, dated April 2000, states the following:

> Uranium occurs naturally in the environment, with the isotopes U234, U235, and U238 occurring at characteristic ratios to one another. The ratio of U-238 to U-234 in natural uranium is typically approximately 1 to 1 (by alpha activity). . . Table 18 [of that report] presents the results of isotopic analyses conducted to date and Table 19 [of that report] presents the isotopic ratios for analyses summarized in Table 18. The isotopic ratios presented on Table 19 indicate that the average ratio of U238 to U234 ranges from 7.00 to 7.82 in samples from monitoring wells HB-12, GZW-7-1, HBPZ-2, and HBPZ-4; these monitoring wells are in close proximity to the Holding Basin and are believed to contain DU [depleted uranium] from the Holding Basin. . . .DU is present in the overburden wells near the Basin (page 15, *Groundwater Monitoring Report, December 1999*, April 2000, prepared for Starmet Corporation by GZA GeoEnvironmental, Inc.).

Thus, Starmet's own report, as cited above, indicates that the ratio of ^{238}Uranium to ^{234}Uranium is not a 1-to-1 ratio as is expected of naturally occurring uranium. Starmet's *Groundwater Monitoring Report, December 1999* further states on page 15 that "[h]ydrogeologic data and the results of analyses of nitrate, which is considerably more mobile in groundwater than is uranium, indicate that *there is a hydraulic connection between overburden and bedrock at the Starmet site*" (emphasis added). This information, as provided in Starmet's report, provides additional support for the attribution of the release of uranium isotopes and its decay products into the groundwater in the overburden aquifer at the Nuclear Metals, Inc. site. The overburden and the bedrock formations are considered one aquifer for the HRS evaluation of this site (HRS Section 3.0.1.1, 3.0.1.2.1, and 3.0.1.2.2). Thus, the uranium isotopes and their decay products are at least partially attributable to the use of depleted uranium and a source of uranium not naturally occurring in the environment. See also Sections 1.2.3.9.5, *Extent of Aquifer*, and 1.2.3.9.6, *Potential Targets*, of this support document for additional discussion.

1.2.3.9.5 Extent of Aquifer

Starmet's comments on the extent of the aquifer are discussed below under the subheadings, *Aquifer Interconnection* and *Aquifer Discontinuity*.

Aquifer Interconnection

Starmet contended that all the wells considered by EPA in the HRS evaluation, except for two wells (Valley Sports and Concord's Second Division Wells), are located in separate aquifer deposits and/or are separated from the site by a hydrologic no-flow boundary. Starmet added that extensive ground water evaluation and water quality data indicate that flow from the NMI property will not reach the Valley Sports well.

Starmet commented that a portion of the site overlies a potentially productive aquifer (PPA), and that the Valley Sports well and the Town of Concord's Second Division well are within this aquifer. However, Starmet contented that none of the other wells identified by EPA are located within the same PPA as the site. Starmet provided Figure 3, a map[7] entitled *Surficial Geology and Aquifer Surrounding the Starmet Facility*, as an attachment to its comments in support of its claim.

Starmet commented that only three wells are identified as being screened in bedrock. According to Starmet, even if the local bedrock and overburden deposits are connected due to the high rate of pumping at SW-2A, the available data suggest that other bedrock supply wells will not be influenced by the site.

Starmet also commented that the bedrock geology of the Hudson and Maynard quadrangles has been mapped by Wallace R. Hansen of the USGS, and this map contains more detailed and site-specific information than the bedrock geologic map of Massachusetts cited by EPA. Starmet added that the Hansen maps show that the area under the site is Assabet Quartz. Starmet stated that according to geologic maps by Wallace R. Hansen, the Pine Hill Condominium well and the Strawberry Hill Apartments wells are screened in the Nashoba formation, whereas the area under the site is in the Assabet Quartz Diorite. Starmet submitted Figure 3, *Surficial Geology and Aquifer Surrounding the Starmet Facility*, Figure 4A, *Map and Sections Showing Bedrock Geology of the Hudson and Maynard Quadrangles, Massachusetts*, and 4B, *Map and Sections Showing Bedrock Geology of the Hudson and Maynard Quadrangles, Massachusetts-Legend*, as attachments to its comments in support of this claim.

In response, the HRS documentation record as proposed appropriately evaluated the overburden aquifer unit and the bedrock aquifer units as one aquifer (pages 36 and 37 of the HRS documentation record). The overburden aquifer unit consists of glacial deposits of gravel, sand, and silt. These deposits filled bedrock valleys and are typically 30 to 70 feet thick; the deposits also thicken to the north of the property and exceed 100 feet in the vicinity of the Assabet River [The Assabet River is just west and north of the site] (page 36 of the HRS documentation record). The bedrock aquifer unit consists of several

[7]This map was prepared for Starmet by GeoSyntec Consultants.

formations: (1) Bedrock beneath Starmet's property, which is mapped "Oznb"and refers the Nashoba Formation (Ordovician or Proterozoic C), Boxford member, thin bedded to massive amphibolite, minor biotite gneiss; (2) Bedrock to the northwest of the Starmet property, which has been mapped as "Ozn" and refers to Silimanite schist and gneiss, partly sulfidic, amphibolite, biotite gneiss, calc-silicate gneiss and marble; and (3) Bedrock to the southeast of the NMI property, which has been mapped as "Ozf" and refers to Nashoba Formation (Ordovician or Proterozoic C), Fish Brook gneiss, light gray biotite-plagioclase quartz gneiss, with a distinctive 'swirl form' foliation (page 37 of the HRS documentation record). Bedrock beneath the property ranges from 45.5 feet to 109 feet. The materials observed during on-site explorations consisted of stratified glacial soils, which overlie glacial till and bedrock. Bedrock elevations decrease toward the Assabet River, which flows over or near a buried pre-glacial stream valley. Starmet's bedrock well (SW-2A) draws water from permeable fracture zones or rock unit contacts. The open contacts and fracture zones in the bedrock serve as conduits, receiving water from storage in the overlying soil deposits and transmitting it through the bedrock (page 37 of the HRS documentation record).

The interconnection of the overlying aquifer unit to the bedrock and the bedrock formations to each other were evaluated according to the directions of HRS Section 3.0.1.2. and 3.0.1.2.1.

HRS Section 3.0.1.2, *Aquifer boundaries*, states the following: "Combine multiple aquifers into a single hydrologic unit for scoring purposes if aquifer interconnections can be established for these aquifers. In contrast, restrict aquifer boundaries if aquifer discontinuities can be established."

HRS Section 3.0.1.2.1, *Aquifer interconnections*, states the following: "Evaluate whether aquifer interconnections occur within 2 miles of the sources at the site. If they occur within this 2-mile distance, combine the aquifers having interconnections in scoring the site."

Reference 49 of the HRS documentation supports that the bedrock formations are hydrologically interconnected. Pages 14 to 15 of Reference 49 of the HRS documentation record states the following:

> The bedrock reported in the plant site area is the Assabet quartz-diorite, an igneous rock unit consisting of medium grained, gray quartz-diorite. However the outcrop of an older unit, know as the Gospel Hill gneiss, underlies areas to the south including the site of Concord's Second Division well. . . .Although rock wells are not generally reliable sources for large quantities of ground water, *NMI has developed a bedrock well of significant yield*. A sustained yield of 160 gpm [gallons per minute] has been attained by this well pumping from what are reported to be rock 'seams' at depths of 265 and 327 feet. Groundwater pumped from bedrock usually originates in joints and fractures within the upper 200 feet of the rock surface. NMI's well is approximately 500 feet in depth and may be drawing from either permeable fracture zones or rock unit contacts such as those which occur in the immediate vicinity. *The open contacts and fracture zones, in turn, serve as conduits, receiving water from storage in the overlying soil deposits and transmitting it through the bedrock. Indications that these zones partially communicate with contaminated ground water or surface water were seen in the results of volatile organic analyses from the September 29, 1980 sampling round* (emphasis added).

Thus, Starmet's own data confirm that bedrock units are also hydrologically connected. That is, underlying the site is Assabet quartz diorite and an older gneiss formation (Gospel Hill gneiss). Both formations are hard rock (metamorphic, and igneous) formations with little or no natural porosity. The porosity comes from fractures and fissures within the rock unit. Typically, these fractures extend into neighboring rock formations with little regard for contacts between rock types, and there is no indication that a confining layer is located within 4 miles of the sources at the site. While all the wells may not be located within the same formations, they are located within the same bedrock aquifer system.

Additionally, Starmet stated the following: "Even if the local bedrock and overburden deposits are connected due to the high rate of pumping at SW-2A . . . ." That is, according to Starmet's implied comment, the high rate of pumping at well SW-2A affects the transmissivity of other well within the overburden and the bedrock aquifer units, thus implying the movement of ground water within the bedrock. This comment by Starmet contradicts its assertion that the bedrock units are not interconnected.

Regarding Starmet's comment that the bedrock beneath the site is Assabet Quartz Diorite whereas the bedrock beneath the Pine Hill and the Strawberry Condominiums is part of the Nashoba formation, these data do not negate that the wells withdraw ground water from the same aquifer. Page 37 of the HRS documentation record states that the bedrock aquifer unit consists of bedrock mapped "Oznb," Nashoba Formation Ordovician or Proterozoic C, "Ozn, Silimanite schist and gneiss, and "Ozf," Noshoba Formation Ordovician or Proterozoic C. Page 14 of Reference 49 of the HRS documentation record, prepared for Starmet by its contractor, states that the bedrock underlying the site area is Assabet Quartz-Diorite, and gneiss formation. As confirmed by Starmet in its comment, the Strawberry Hill and the Pine Hill condominium wells are in the Nashoba formation. Also, and most importantly, the bedrock formations are fractured, allowing ground water flow between the formations. The Nashoba formation is part of the bedrock aquifer unit evaluated for this site. Thus, the Pine Hill and the Strawberry Condominiums wells are within the bedrock aquifer unit evaluated for the ground water migration pathway.

Figure 3, *Surficial Geology and Aquifer Surrounding the Starmet Facility,* Figure 4A, *Map and Sections Showing Bedrock Geology of the Hudson and Maynard Quadrangles, Massachusetts,* Figure 4B, *Map and Sections Showing Bedrock Geology of the Hudson and Maynard Quadrangles, Massachusetts-Legend,* and Table 1, *Concentrations of Trichloroethene and 1,1,1-Trichloroethane in Wells OW-1, MW-1, and SW-1,* submitted as attachments to Starmet's comments do not provide documentation that the overburden unit and the bedrock unit are not interconnected, or that the various bedrock formations are not connected. These attachments to Starmet's comments on the proposed listing do not document a confining layer between the sources at the site and the wells evaluated as potential targets.

Aquifer Discontinuity

According to Starmet, the Assabet River, located west of the site, constitutes a barrier to ground water flow and contaminant migration. Therefore, Starmet concluded that the Acton Water District wells Assabet 1 and Assabet 2, which are on the opposite side of the Assabet River from the site, would not be contaminated by ground water coming from the site.

Starmet added that many wells included in the HRS evaluation are located in separate basins or subbasins; these areas are commonly separated by till or other low-permeability material, which serve as ground water barriers. Starmet also submitted Table 3, *Concentrations of Trichloroethene and 1,1,1-Trichloroethane in Wells OW-1, MW-1, and SW-1* as an attachment to its comments in support of this claim.

Starmet commented that Zone II studies present a more detailed, site-specific evaluation of ground water flow to a production well and are a far more accurate delineation of the area contributing to a well than a simple review of the extent of a particular deposit. According to Starmet, Zone II studies were completed and approved by DEP for the Town of Concord's wells, the Second Division wells, the Jennie Dugan wells, the White Pond wells, the Deaconess wells, and Hugh Cargill wells, and "[t]hese Zone II studies clearly indicate that the Site is not located in the Zone II areas of any of these wells. This detailed, site-specific information is strong evidence that contaminants from Starmet will not migrate to the Concord municipal wells, including the nearest, Second Division Well." Starmet also added that because the site is also not within the Zone II of the Assabet 1 and Assabet 2 wells, which are the closest Acton Water District wells to the site, this is strong evidence that the site does not pose any threat to the Acton Water District supply wells.

Regarding the delineation of an Interim Wellhead Protection Area, Starmet stated the following:

> Prior to the delineation of a site-specific Zone II area for a production well, an Interim Wellhead Protection Area (IWPA) is established as a radius around the well. Because the Zone II area is delineated based on site-specific hydrogeologic information, it is a more accurate delineation of the area that contributes recharge to a pumping well. . . EPA reported (*pg. 52 of the HRS Package* [HRS documentation record]) that the site is within the IWPA for the Second Division Well.

According to Starmet, the IWPA information for the Second Division well is outdated and has been superseded by the Zone II study, which is more recent and detailed information. Thus, Starmet concluded that "[t]he site is not within the IWPA of any of the wells for which Zone II areas have been approved by DEP." With regards to the Valley Sports well, Starmet stated that its IWPA does not extend to the site, and site specific groundwater flow direction and water quality data indicate that ground water flow from the site is not towards this well. In summary, Starmet stated that the target score of the HRS documentation record failed to consider regional, local, and site-specific information which had been readily available to EPA, and thus, the score has been overstated.

In response, for HRS purposes, the extent of the aquifer was adequately determined for this site. The Assabet River and Zone II studies do not demonstrate HRS aquifer discontinuities at this site. According to HRS Section 3.0.1.2.2, *Aquifer discontinuities*:

> Evaluate whether aquifer discontinuities occur within the 4-mile target distance limit. An aquifer discontinuity occurs for scoring purposes only when a *geologic, topographic, or other structure or feature entirely transects* an aquifer within the 4 mile target

> distance limit, thereby creating a continuous boundary to ground water flow within this limit. If two or more aquifers can be combined into a single hydrologic unit for scoring purposes, an aquifer discontinuity occurs only when the structure or feature entirely transects the boundaries of this single hydrologic unit (emphasis added).

For HRS purposes, the Assabet River would have to physically transect the entire interconnected aquifer system to be considered a discontinuity. Figure 5 of Reference 45 of the HRS documentation record as proposed and Starmet's Figures 4A and 4B indicate in a cross section that the Assabet River bed is approximately 30 feet deep. The documentation record lists the thickness of the overburden aquifer unit alone as 100 feet in the area of the river (page 30 of the HRS documentation record). There is no indication on the available figures or any other material provided by Starmet that the Assabet River is deep enough to bisect the aquifer being evaluated. Also, Reference 49 of the HRS documentation record, prepared for Starmet by its contractor, states that a large aquifer extends northeast along **either side** of the Assabet River between Maynard and Concord, Massachusetts (page 13 of Reference 49 of the HRS documentation record). Thus, the Assabet River has not been shown to transect the aquifer entirely within the 4 mile target distance limit. Because the Assabet River is not a continuous barrier in the overburden and the bedrock aquifer units, ground water overburden and bedrock wells on the north and the west side of the Assabet River were appropriately considered HRS eligible targets.

Thus, the Acton Water District wells Assabet 1 and Assabet 2 withdraw ground water in the overburden and bedrock aquifers within 4 miles of the site (page 46 of the HRS documentation record). Because no aquifer discontinuity exists between these wells and the sources at the site, they were appropriately considered targets of the ground water migration pathway.

Regarding Starmet's comment that the Zone II delineation studies present a more detailed evaluation of the ability of a contaminant to migrate, these ground water models are not physical boundaries of the extent of an aquifer. These zone boundaries are only computer generated theories as to the nature of ground water flow. Regardless of the zones used by the Town of Concord, the wells evaluated are within 4 miles of the site and are considered by HRS standards to be targets. HRS Section 3.0.1.1, *Ground water target distance limit*, states the following:

> The target distance limit defines the maximum distance from the sources at the site over which targets are evaluated. Use a target distance limit of 4 miles for the ground water migration pathway, except when aquifer discontinuities apply. . . .

Thus, the Jennie Dugan well, the White Pond well, the Deaconess well, the Hugh Cargill wells, and the Acton Water District Assabet 1 and Assabet 2 wells were properly evaluated as targets because these wells resided within the same aquifer for which an observed release attributable to the site has been documented, and they are within the 4-mile target distance limit with no aquifer discontinuity.

1.2.3.9.6 Potential Targets

Starmet contended that although the HRS requires that supply wells within 4 miles of the site be evaluated as targets, there was significant evidence to indicate that ground water for the site does not and cannot migrate to the water supply wells. Starmet added that significant information was available to indicate that the water supply wells identified by EPA are not affected by site-related contamination, but that the HRS package ignores the available data and scores every well within the 4-mile radius as having potential to be affected by contamination from the Starmet site. Starmet then contended that this results in a distance-weighted population value as if vast numbers of people are consuming or have the potential to consume drinking water from wells impacted by the site sources. Starmet stated the following:

> This approach is inconsistent with the application of sound professional judgement. It creates a substantially unrealistic portrait of the potential risk posed by the Starmet site, and significantly skews the score calculated for the Site to the point it no longer 'accurately assesses the relative degree of risk to human health...' as required in the HRS regulations.

In response, as discussed in Section 1.2.3.9.5 of this support document, the "evidence" referred to by Starmet is based on what it considered lack of interconnection, presence of discontinuity, or ground water flow model, considering flow direction. As explained in that section, Starmet is incorrect. Furthermore, regarding flow direction, the HRS does not specifically take into account such level of detail as ground water flow gradients to determine potential target populations under the HRS (Section L of the Preamble to the HRS, *Ground Water Migration Pathway*). In responding to public comments on the proposed (original) HRS on July 16, 1982 (47 FR 31190), EPA explained that it is generally not practicable to determine the population actually exposed or threatened by using ground water flow information. In many instances, the information is not available, and in others the flow direction varies over time. Even where there is extensive knowledge of geohydrology, interpretation is nearly always subject to dispute. Requiring a precise measure of the affected population would add inordinately to the time and expense of applying the HRS. EPA decided not to use ground water flow information, even when available, because of the need to develop a nationally uniform system for scoring a large number of sites expeditiously with commonly available data. EPA reconsidered this issue when revising the HRS, and determined that the decision not to directly consider ground water flow direction in evaluating targets was still appropriate (Section L of the Preamble to the HRS, *Ground Water Migration Pathway*).

Instead, the HRS considers flow direction indirectly in the method used to evaluate target populations by weighting target populations based on actual and potential contamination of drinking water wells. The HRS uses a radius of 4 miles around the site when determining the distance to the nearest well in the contaminated aquifer and the population at risk due to actual or potential contamination, provided there is no discontinuity that completely transects the aquifer of concern between the site and the well being scored for HRS purposes (Section 3.0.1of the HRS, *General Considerations*).

In addition, if wells have not been contaminated by the site, as would be typical of upgradient wells, the wells are considered potentially rather than actually contaminated, and the population drawing from those wells is distance weighted (Section 3.3.2.4, *Potential contamination*). Conversely, if wells have

been contaminated, a likelihood for downgradient wells, the wells are considered actually contaminated and given higher weight in scoring.

In evaluating the populations that may be impacted by the release of hazardous substances to the overburden and the bedrock aquifer units, HRS Sections 3.3.2.1 and 3.3.2.4 were also considered. According to HRS Section 3.3.2.1, *Level of contamination*, "evaluate the population served by water from a point of withdrawal based on the level of contamination for that point of withdrawal. . . If no samples meet the criteria for an observed release for a point of withdrawal, evaluate that point of withdrawal using the potential contamination factor in section 3.3.2.4." HRS Section 3.3.2.4, *Potential contamination*, states: "determine the number of people served by drinking water from points of withdrawal subject to potential contamination. Do not include those people already counted under the Level I and Level II concentrations factor. Assign distance-weight population values from Table 3-12 to this population. . ."

The ground water wells evaluated as targets are either an overburden or a bedrock well and are within the four mile radius of the site (page 46 of the HRS documentation record). Because the target wells are within the same interconnected aquifer as the observed release monitoring wells, they are evaluated as eligible target wells of the ground water pathway with the associated populations served by these wells as potential targets. Thus, the populations served by the Valley Sports, Acton District Wells Assabet No. 1 and Assabet No. 2, Second Division, Jennie Dugan, Pine Hill Condominiums, Strawberry Hill, White Pond, Deaconess, and Hugh Cargill wells (as well as all the other wells listed on page 46 of the HRS documentation record but not challenged by Starmet) are appropriately evaluated as target wells subjected to potential ground water contamination (page 46 of the HRS documentation record). The associated population served by these wells was apportioned according to the directions of HRS Section 3.3.2.4, *Potential contamination* and HRS Table 3-12, *Distance-Weighted Population Values for Potential Contamination Factor for Ground water Migration Pathway* (pages 46, 47 and 50 of the HRS documentation record).

1.2.3.9.7 Documentation Errors

Starmet identified errors in the data for wells ML-3 and SW-2A.

Well ML-3

Starmet commented that monitoring well ML-3-1 is screened in the overburden, not the bedrock as indicated on page 40 of the HRS documentation record.

In response, page 40 of the HRS documentation record incorrectly states that well ML-3 is a bedrock well. The HRS documentation record indicates that the overburden aquifer is typically 30 to 70 feet and in some areas as much as 100 feet (page 36 of the HRS documentation record). The HRS documentation record lists the screened interval of well ML-3-1 as 25 to 30 feet (page 40 of the HRS documentation record). Thus, because the screened interval of ML-3-1 is in the overburden, the HRS documentation record should have listed that well as an overburden well.

According to Reference 67 of the HRS documentation, which was prepared by GZA for Starmet, well ML-3-1 is screened at 25-30 feet, has a boring depth of 55.5(C), and has a depth to bedrock of 45.5 feet. The "(C)" indicates at the end of Table 1 of Reference 67 that bedrock was cored for this well. This information is further collaborated on page 37 of Reference 67 of the HRS documentation record which states that "[b]edrock was cored at two locations, ML-1 and ML-3, during GZA's 1984 hydrogeologic investigation, and at three locations (GZW-6 through GZW-8) during the Phase II study." However, ML-3 is the location of wells ML-3-1, ML-3-2, and ML-3-3. ML-3-1 through ML-3-3 are installed in one bore hole, each with its own screened interval.

This comment has no impact on listing the NMI site because the overburden and the bedrock aquifer units are interconnected and considered as one aquifer for HRS purposes (page 36 of the HRS documentation record).

Well SW-2A

Starmet commented that the HRS documentation record indicated that the Department of Environmental Quality Engineering (DEQE) sampled well SW-2A on March 25, 1980. According to Starmet, well SW-2A had not been installed in 1980 and DEQE had sampled well SW-1, not SW-2A.

In response, EPA agrees with Starmet that well SW-2A was not sampled on March 25, 1980. Table 1 of Reference 67 indicates that wells SW-1 and SW-2 were installed in 1959 and 1978, respectively. According to Table 1 of Reference 67 of the HRS documentation record, well SW-2A was installed in 1987, and that well SW-2A replaced well SW-2. Based on the available information, either well SW-1 or SW-2 was sampled in 1980, not well SW-2A. This error has no impact on the site score because the 1980 data were not used in the HRS scoring of the site. Rather, the 1997 and the 1998 sampling of well SW-2A were used to document an observed release of uranium and manganese, respectively (page 41 of the HRS documentation record).

1.2.3.10 Surface Water Migration Pathway

Comments submitted by Starmet addressed the waste characteristics assigned value, the overland flow from sources at the site, and the background level of the surface water migration pathway.

1.2.3.10.1 Waste Characteristics Assigned Value

Starmet contended that the ecosystem toxicity/persistence/bioaccumulation factor value should be reduced from 500,000,000 to 5,000,000. Starmet stated the following in support: (1) The PAHs from the oil spill should be excluded under CERCLA, and the low level PAHs in surficial soils in other parts of the site are consistent with urban background levels. (2) Lead and thorium, receiving the next highest toxicity/persistence/bioaccumulation factor value, have been detected at levels consistent with background at the site and are clearly naturally occurring (not anthropogenic) levels. (3) The toxicity/persistence/bioaccumulation factor value should be based on copper, with a value of 5,000,000, thus reducing the waste characteristics score from 320 to 100.

In response, the HRS documentation record as proposed has properly evaluated the waste characteristics assigned value for the surface water migration pathways for the NMI site. First, the PAH compounds were not excluded from HRS scoring because Starmet has not demonstrated, but only speculated, their presence is related to petroleum releases. See Section 1.2.3.7 of this support document. Second, the PAH compounds, lead, and thorium were appropriately identified as hazardous substances present in the sources. See Sections 1.2.3.6 and 1.2.3.8 of this support document.

Even if EPA were to drop consideration of the PAH compounds, lead, and thorium, the surface water pathway score would remain unchanged. Although the waste characteristics factor value would be reduced from 320 to 180, the contributions of the observed release score and the targets score would still maintain the original surface water migration pathway score. As shown on page 82 of the HRS documentation record, the ecosystem toxicity/persistence factor value for ^{226}Radium is 10,000, which when multiplied by the hazardous waste quantity factor value of 100, yields an ecotoxicity/persistence/hazardous waste quantity factor value of 1,000,000. The bioaccumulation potential factor value for ^{226}Radium is 5,000, which when combined with the ecotoxicity/persistence/hazardous waste quantity factor value of 1,000,000, yields a toxicity/persistence/bioaccumulation factor value of 5,000,000,000 (5×10^9 or 5E+9) (pages 83 to 86 of the HRS documentation record as proposed). According to HRS Table 2-7, an ecotoxicity/persistence/hazardous waste quantity/bioaccumulation potential factor of 5×10^9 yields a waste characteristics factor category value of 180. Although this value is lower than the 320 assigned using benzo(a)anthracene or benzo(a)pyrene, the overall site score remains unchanged because when the waste characteristics value of 180 is combined with the observed release assigned value of 550 and the targets assigned value of 300, an environmental threat score[8] of 60, the maximum, is still achieved (HRS documentation record, pages 7, 8, and 81 to 86; HRS Tables 2-7 and 4-1).

Overall, Starmet's comments on the assigned waste characteristics factor values have no impact on the site score.

1.2.3.10.2 Overland Flow

Starmet commented that the evaluation of the bog as a target is compromised because the samples cited in the discussion of contributing areas to the bog do not represent a possible threat and lack a pathway between the sample locations and the bog. Starmet also stated that the calculation provided for the area that is contributing overland flow to the bog is incorrect in that it does not reflect the location of the surface water divide around the bog; and the area in the HRS documentation record is different from that calculated in Reference 33 of the HRS documentation record.

Starmet contended that the Cooling Water Recharge Pond and the former Holding Basin are not within the drainage area of the bog. Starmet stated that there is a surface water divide located between the bog to the east and the Cooling Pond and the Holding Basin to the west. According to Starmet, this ridge

[8]Surface Water Migration Environmental Threat Score Calculation: (550 x 180 x 300)/82,500 = 360. A maximum of 60 can be assigned for the environmental threat score (HRS Table 4-1)

prevents overland flow from the areas around the building, the Cooling Water Recharge Pond, and the former Holding Basin from reaching the bog. Thus, Starmet contended that the contaminants identified in the former Holding Basin, the Cooling Water Recharge Pond, and the areas around the site should not be included as potential contaminants via overland flow to the bog.

Starmet also commented that because the size of Source 3 is inaccurate, and site-related contaminants have not been identified in soils to the east of the bog, Source 3 should not be expected to contribute contaminants to the bog via overland flow.

In response, the surface water overland /flood component of the surface water migration pathway was adequately determined. According to the HRS Section 4.1.1.1, *Definition of hazardous substance migration path for overland/flood migration component*, "[t]he hazardous substance migration *path* includes both the overland segment and the in-water segment *that hazardous substances would take as they migrate away from sources at the site*: Begin the overland segment at a source and proceed downgradient to the probable point of entry to surface water. Begin the in-water segment at this probable point of entry" (emphasis added).

The HRS documentation record as proposed states that the probable point of entry of overland flow into the sphagnum bog, an isolated wetland, would occur at the two former holding basin discharge pipes located along the southwestern edge of the sphagnum bog (page 53 of the HRS documentation record). Thus, the overland flow includes direct discharge from the holding basin to the sphagnum bog. As stated on page 21 of the HRS documentation record, "[f]rom 1958 to 1985, Starmet discharged process wastes described as a mixed oxide/hydroxide material to the unlined holding basin." Reference 51, page 19 states that "[a]t the time the facility was constructed, it was intended that the Holding Basin would be used to contain only the metal hydroxide sludge noted above, and that supernatant liquid from this discharge would be piped to the 'cranberry bog.' However, this discharge was discontinued after only a brief use, and the supernatant was subsequently discharged to the Holding basin." Figure 3 of Reference 65 of the HRS documentation record, *Supplemental Phase II Field Investigation, Nuclear Metals, Inc. 2229 Main Street, Concord, Massachusetts* (prepared for Starmet by GZA), shows the approximate location of the former discharge pipe into the sphagnum bog.

Regarding the contaminated soil east of the bog, the area east of the bog is at an elevation of 30 to 40 meters above mean sea level, while the sphagnum bog is at an elevation of 30 meters above mean sea level (Reference 3 of the HRS documentation record). This information supports that the area east of the bog may also drain toward the sphagnum bog. The soil samples collected in the area east of the bog include but are not limited to samples GS-14, GS-15, GS-16, and GS-18 in which beryllium, ^{235}Uranium, and ^{238}Uranium were identified (pages 31, 32, and Figure 4 of the HRS documentation record). Again, the topography for the site supports that overland flow from the area east of the bog would drain towards the sphagnum bog, thus substantiating the overland flow to the sphagnum bog. Regarding Starmet's comment that the size of Source 3, Contaminated Soil, at the NMI site is overstated, the area of Source 3 was adequately determined. This comment is addressed in Section 1.2.3.8.4 of this support document.

1.2.3.10.3 Surface Water Background

Starmet also commented that historical and recently collected surface water samples suggesting that organisms inhabiting the lagg[9] zone of the bog may be exposed to potentially harmful levels of copper may be inaccurate. Starmet then contended that recently collected data from similar bogs suggests that copper concentrations above Ambient Water Quality Criteria (AWQC) are a naturally occurring condition for sphagnum bogs.

In response, the concentration of copper in the sphagnum bog was properly evaluated as being above the site-specific background level as well as being above the ambient water quality criteria for protection of aquatic life (AWQC). Although the HRS does not provide specific directions for the collection of background samples, HRS Section 4.1.2.1.1 states to "[l]imit comparisons to similar types of samples and background concentrations-for example, compare surface water samples to surface water background concentrations." The HRS does not direct the scorer to assess the concentration of a hazardous substance in the surrounding sensitive environments when evaluating if a hazardous substance is above the background level.

A site-specific background level for the sphagnum bog was established using surface water sample CBSW-9 and sediment sample CB-14A which were collected from the bog in question. The background sample and the observed release samples were collected from the same media and under the same environmental conditions as the observed release samples. That is, the surface water background samples and the observed release surface water samples are surface water samples from the sphagnum bog; were collected on June 12, 1996; and are surface water samples from the edge of the bog where a lagg zone is present (HRS Reference 65, Table 2, Figure 3; page 55 of the HRS documentation record). Likewise, the surface water sediment background samples and the surface water sediment observed release samples are similar. Both sets of samples are sediment samples from the sphagnum bog; were collected on May 31, 1996; and were collected surficial sediments immediately below the layer of growing plants (Reference 65, page 4, Table 1, page 4; pages 57 and 58 of the HRS documentation record). Thus, the observed releases and the background samples are similar.

Although Starmet refutes the concentrations of copper that are above the AWQC, it does not contest that in the background level for the sphagnum bog (sample CBSW-9), copper is "not detected" at an SQL of 0.012 ppm (or 12 ppb). Additionally, Starmet's own data state the following:

> Uranium concentrations are above background levels, and were highest in samples collected from the southwest corner of the bog (CBSW-6 through CBSW-8; CB-16AD through CB-18AD). Copper concentrations are also higher in these locations. This distribution is consistent with information from the previous investigation (page 13 of Reference 65 of the HRS documentation record, *Supplemental Phase II Field Investigation, Nuclear Metals, Inc.* (prepared by GZA for Starmet), December 1996).

[9] An area of the wetland where water accumulates.

The sphagnum bog is assessed as an actually contaminated target. According to HRS Section 2.6, *Targets*, an actually contaminated target is a target that is "associated either with a sampling location that meets the criteria for an observed release (or observed contamination) for the pathway or with an observed release based on direct observation for the pathway. . . " (HRS Section 2.5, *Targets*). The HRS documentation record shows that in the following sample collected from the sphagnum bog, the concentration of copper in observed release sample CB-18AD is 0.14 parts per million (or 140 parts per billion (ppb)) which is above the 0.012 ppm (or 12 ppb) AWQC for copper. Likewise, the concentration of copper in samples CBSW-7 (122 ppb), CBSW-8 (92 ppb), CBSW-10 (27 ppb), CB-16AD (70 ppb), CB-17AD (117 ppb), and CBSW-6 (75 ppb) are all above the AWQC for copper (pages 87 to 89 of the HRS documentation record).

1.2.4 Conclusion

The original HRS score for this site was 58.31. Based on the above response to comments, the score remains unchanged. The final scores for the Nuclear Metals, Inc. site are:

Ground Water:	100.00
Surface Water:	60.00
Soil Exposure:	Not Scored
Air:	Not Scored
HRS Score:	58.31

1.3 SUTTON BROOK DISPOSAL AREA, TEWKSBURY, MASSACHUSETTS

1.3.1 List of Commenters and Correspondents

NPL-U33-3-2-1-R1	Comment dated September 8, 2000 from Jeffrey N. Martin, Robert L. Gulley, and Beth H. Regas of Hunton & Williams on behalf of Allied Waste Industries, Inc.
NPL-U33-3-2-2-R1	Comment dated September 11, 2000 from Thomas G. Carbone, R.S., Director of Public Health, Tewksbury, Massachusetts
NPL-U33-3-2-3-R1	Comment dated September 21, 2000 from Matthew L. Wilson, Director, Toxics Action Center, Boston, Massachusetts
NPL-U33-3-2-4-R1	Comment dated October 25, 2000 from Jeffrey N. Martin, Robert L. Gulley, and Beth H. Regas, of Hunton & Williams on behalf of Browning-Ferris Industries, Inc.
NPL-U33-5-2-R1	Correspondence dated May 8, 2000 from the Honorable Argeo Paul Celluccii, Governor of Massachusetts
NPL-U33-5-8-R1	Correspondence dated September 20, 2000 from David Evans, Director, State Tribal & Site Identification Center, Office of Emergency & Remedial Response

1.3.2 Site Description

The Sutton Brook Disposal Area is located off South Street on the eastern boundary of Tewksbury, Middlesex County, Massachusetts. A small portion of the site also extends into the Town of Wilmington, Massachusetts. The site is in excess of 50 acres and is bounded by a former railroad grade along the northern boundary, beyond which is a former piggery and a forested area; residential properties to the west; undeveloped woodland and wetlands to the south; and the Tewksbury/Wilmington town line and agricultural land to the east. The site includes three source areas: a 50-acre landfill divided into a northern and southern lobe separated by Sutton Brook, an area of buried drums, and contaminated soils associated with the drum disposal area located just to the west of the landfill northern lobe.

Several additional drum burial areas and suspected disposal areas have recently been identified in the vicinity of the site and have been or will be investigated by EPA and the Massachusetts Department of Environmental Protection (DEP). These include a drum disposal area northeast of McDonald Road in Wilmington, Massachusetts (McDonald Road disposal area), and two drum disposal areas located on Krochmal Farm (Wilmington Disposal Area), one in Wilmington and one in Tewksbury. Due to response actions taken by potentially responsible parties (PRPs), under an EPA order, and the Commonwealth, the McDonald Road disposal area is not expected to be of concern in the future. One of the drum disposal areas at the Wilmington Disposal Area has been the focus of an EPA-lead removal and

has been completed pending additional Massachusetts DEP assessment work. The second drum disposal area at the farm is just now being investigated. As assessment of the Wilmington Disposal Area continues and additional information becomes available, the U.S. Environmental Protection Agency (EPA) will more precisely determine the extent of the Sutton Brook site.

Waste disposal activities at the Sutton Brook Disposal Area can be traced back to at least 1957 when an area of the site was used as a "burning dump." This area was originally designated by the Tewksbury Board of Health as a temporary disposal area (landfill). In 1961, the temporary assignment was modified to require that the landfill on the site be operated as a sanitary landfill, accepting municipal refuse generated only in the Town of Tewksbury. The assignment was not complied with, as the landfill accepted municipal, commercial, and industrial waste from both inside and outside the town. The owners of the landfill received numerous violation citations from state and local officials for violating Massachusetts Sanitary Landfill Regulations.

In 1966, the Town of Tewksbury was ordered by the Commonwealth of Massachusetts Commissioner of Public Health to operate the landfill using the sanitary landfill method. However, after 1966, there were documented occurrences of landfill burning, uncovered waste areas, the filling in of on-site wetlands, wastes disposed below the water table, and landfill slopes that exceeded operations plans. RCRA Interim Status was granted to Anthony Rocco, the owner of the property, in 1977. Due to continued violations, the Commonwealth ordered the closure of the landfill in 1979. At the time of its closure, the landfill was accepting in excess of 250 tons of waste per day. Despite the closure order, landfill operations continued until 1982, when official landfill operations were suspended, but waste acceptance continued through 1988. Throughout this period, the Commonwealth pursued enforcement options under RCRA without success. When Mr. Rocco subsequently died, the Court found remaining family members not to be liable for conditions at the site.

In 1983, a loam screening business began operation on the property. On 11 August 1983, during an inspection by the Massachusetts Department of Environmental Quality Engineering (currently the Massachusetts DEP), underground burning was observed through fissures in the ground in the southern landfill lobe. During a subsequent inspection on 12 August 1983, flames and smoke were no longer visible after heavy machinery had covered the fissures with soil. Subsequent investigations by Tewksbury Health Inspectors and the Massachusetts Department of Environmental Quality Engineering documented piles of demolition debris and soil on areas of the property, in some cases adjacent to and/or encroaching upon on-site wetland areas.

Numerous investigations of the site by local, state, and federal organizations have revealed the presence of volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), pesticides, polychlorinated biphenyls (PCBs), and inorganic elements in the sources at the site. Observed releases of some of these same substances have also been identified in area ground water and in the sediments and waters of Sutton Brook.

1.3.3 Summary of Comments/Correspondence

Governor Argeo Paul Celluccii of the Commonwealth of Massachusetts wrote in support of the listing.

Thomas G. Carbone, Director of Public Health, Town of Tewksbury Board of Health, and Matthew L. Wilson, Director, Toxics Action Center, also supported adding the Sutton Brook Disposal Area site to the NPL.

Jeffrey N. Martin, Robert L. Gulley, and Beth H. Regas of Hunton & Williams, representing Allied Waste Industries, requested an extension of the public comment period to allow them to obtain all relevant documents and employ the services of consultant to "review the complex technical information that underlies EPA's scoring decision." EPA subsequently granted a 30-day extension of the comment period (see NPL-U33-5-8-R1). Following the extended comment period, these same commenters wrote on behalf of Browning-Ferris Industries, Inc. (hereafter referred to as BFI) and objected to the listing on several grounds. While stating that it agreed with the HRS package that the site should be limited to the Sutton Brook Disposal Area and not include other nearby disposal areas, BFI suggested that EPA should postpone the listing decision until after the completion of an ongoing removal action at the drum disposal area and associated contaminated soils (Sources 2 and 3). It suggested further that EPA should first determine whether the Town of Tewksbury may remediate the landfill in accordance with Massachusetts requirements. The Town is familiar with the conditions and history of the site and the State has adequate authority to address the site.

BFI also objected to the listing on the basis of risk to human health and the environment. It commented that the HRS provides a very conservative approach to evaluating impacts to human health and the environment. It submitted a copy of a 1992 memorandum from ATSDR that concluded "ATSDR does not believe that levels of chemical substances detected at the site (at this time) pose an immediate health threat to nearby residents or those that gain access to the site for recreational purposes." It objected that the site score was driven by the presence of PAHs in wetland samples that are not representative as demonstrated by the absence of these substances in waters or sediments of Sutton Brook. It commented further that these substances are not likely to impact Sutton Brook due to their distance from the brook, the heavy vegetation, and the relative immobility of the substances.

BFI commented that ground water quality conditions downgradient of the site indicate an absence of or significantly reduced concentrations of contaminants. It also commented that no public or private water supply wells have been impacted as a result of the site. Finally, BFI commented that localized impacts to surface water and sediments are characterized by the presence of VOCs, SVOCs, and metals, but that these constituents are attenuated to the point where they are not detected downstream northwest of the site. Therefore, BFI concluded that surface water and sediments pose no apparent risk to nearby or off-site receptors.

1.3.3.1 Site Definition

BFI commented that it "agrees with, and strongly supports EPA's decision to confine the listing decision to the Sutton Brook Disposal Area. The decision not to include the McDonald Road and Wilmington Disposal Areas is technically sound and will facilitate the expeditious resolution of any contamination problems associated with each of the three areas." In separate comments prepared for BFI by its technical consultant, Brown and Caldwell (BFI Exhibit A), BFI commented that operations in the McDonald Road and Wilmington Disposal Areas appear to have been different and that the sites are geographically separated by as much as ½ mile.

In response, BFI has misinterpreted information in the HRS documentation record regarding the issue of site definition. The Agency has not determined the precise extent of the site at this time. Page iii of the HRS documentation record as proposed notes that "additional drum burial areas and suspected disposal areas have recently been identified in the vicinity of the site and are currently being investigated by the Massachusetts Department of Environmental Protection . . . As additional information becomes available, the U.S. Environmental Protection Agency (EPA) will determine whether these other source areas should be included in the Sutton Brook Disposal Area site." As noted above in the narrative summary, the McDonald Road disposal area has already been addressed and is not expected to be of concern in the future. A more detailed discussion of additional possible sources of contamination is presented on pages 42 and 43 of the HRS documentation record as proposed, including a storage trailer area located east of the on-site warehouse building and the two drum disposal areas noted by BFI.

As explained in Section F of the Preamble to the proposed rule (65 FR 46131, July 27, 2000), the NPL does not describe releases in precise geographical terms; it would be neither feasible nor consistent with the limited purpose of the NPL (to identify releases that are priorities for further evaluation), for it to do so. The Preamble continues:

> Although a CERCLA "facility" is broadly defined to include any area where a hazardous substance release has "come to be located" (CERCLA section 101(9)), the listing process itself is not intended to define or reflect the boundaries of such facilities or releases. Of course, HRS data (if the HRS is used to list a site) upon which the NPL placement was based will, to some extent, describe the release(s) at issue. That is, the NPL site would include all releases evaluated as part of that HRS analysis.
>
> When a site is listed, the approach generally used to describe the relevant release(s) is to delineate a geographical area (usually the area within an installation or plant boundaries) and identify the site by reference to that area. As a legal matter, the site is not coextensive with that area, and the boundaries of the installation or plant are not the "boundaries" of the site. Rather, the site consists of all contaminated areas within the area used to identify the site, as well as any other location to which that contamination has come to be located, or from which that contamination came.

Further, NPL listing does not assign liability to any party or to the owner of any specific property. Thus, if a party does not believe it is liable for releases on discrete parcels of property, supporting information

can be submitted to the Agency at any time after a party receives notice it is a potentially responsible party. For these reasons, the NPL need not be amended as further research reveals more information about the location of the contamination or release.

1.3.3.2 Consideration of Response Actions

BFI expressed the view that "EPA's proposal to list the Sutton Brook Disposal Area on the NPL is premature." BFI commented that the "current drum and soil removal [Sources 2 and 3] will address the significant contamination at the site. Thus, any listing decision should await an evaluation of the facility after that action is complete." BFI continued, "[i]f the site were scored after that project is complete, the Landfill may not qualify for inclusion on the NPL." In its technical comments prepared by Brown and Caldwell, BFI also noted that following the removal, "these materials will no longer exist as source areas." BFI claimed that, due to the nature of the materials disposed in each of the disposal areas, "the potential contaminant source loading represented by the Area 1 MSW [municipal solid waste] is much less than that of the organic solvent waste disposal in Areas 2 and 3" (the areas subject to the removal action).

In response, BFI suggested that EPA should delay the listing decision at the Sutton Brook Disposal Area for two reasons. First, it suggested that the HRS score for the site might be significantly affected by a reduction of the hazardous waste quantity value. Second, BFI commented that the "contaminant source loading" from the municipal solid waste in Source 1 is less than that from the organic solvents in Sources 2 and 3 which are being removed. As acknowledged by BFI, however, the removal actions at Sources 2 and 3 are not complete. In addition, it should be noted that, although the removals may address short term concerns about surficial contamination, these actions may not reduce long term threats from exposure to contaminated ground water and surface water. For example, actions are underway to remove the drums and contaminated soils identified in the HRS documentation record as Sources 2 and 3. The observed releases to ground water and surface water, however, are discussed on pages 46 through 52 (ground water) and 65 through 72 (surface water) of the HRS documentation record as proposed. The highest concentrations of toluene and xylenes were identified in samples GW-12 and GW-13 which were collected just south, and downgradient, of the area designated as Sources 2 and 3 (See Figure 6 of the HRS documentation record for sample locations). Remediation of contaminated ground water at this site is not the subject of currently planned removal actions. The observed releases to surface water are also unaffected by response actions currently underway or planned.

The effects of removal actions on HRS scores are discussed in Section Q of the Preamble to the HRS final rule (55 FR 51567-51569, December 14, 1990). EPA notes that "[i]n making this decision [to consider some removal actions in HRS scoring], EPA tried to balance the benefits of considering removal actions in HRS scores . . . while also ensuring that the HRS score reflects any continuing risks at sites where contamination occurred prior to any response action." The Preamble continues:

> Therefore, EPA will calculate waste quantities based on current conditions. However, EPA believes the accuracy of this approach depends on being able to determine with reasonable confidence the quantity of hazardous constituents remaining in sources at the site and the quantity released into the environment.

At the Sutton Brook Disposal Area, "current conditions" are that the wastes are still in place because the removal actions are not complete. In addition, BFI made no attempt to determine the extent of contamination that will remain at the site, including contamination in sources and releases, after the removals are complete. In the absence of such information, EPA can make no determination as to the reduction in risk to human health and the environment.

Further, it should be noted that the hazardous waste quantity value of 100 was assigned at the Sutton Brook site based on the combined quantities of the three sources at the site. The evaluations of hazardous waste quantity for Sources 1, 2, and 3 are discussed on pages 23 through 25, 30 through 32, and 39 through 41 of the HRS documentation record as proposed, respectively. These sections are summarized on page 55 of the HRS documentation record. The hazardous waste quantity values assigned to Sources 1, 2, and 3 were 760, 6, and 0.35, respectively, resulting in an assigned hazardous waste quantity factor value of 100, representing those sites for which the combined source waste quantity values fall between 100 and 10,000 (see HRS Table 2-6, *Hazardous Waste Quantity Factor Values*).

As can be seen from this discussion, the contribution of the hazardous waste quantity values assigned to Sources 2 and 3 to the total waste quantity value for the site was minimal, and the assigned waste quantity value for the site would remain 100 even if the quantities in these sources were discounted. Thus, the removals at Sources 2 and 3 could not affect the waste quantity factor value or the HRS score.

Regarding BFI's comments concerning "contaminant source loading" from the municipal solid waste in Source 1, the types and amounts of contaminants present in sources at the site and available for migration to potentially exposed targets cannot be completely determined based on the limited data from a site inspection. It should be noted, however, that the most hazardous substances at the site were identified in Source 1. Waste characteristics values for the surface water human food chain threat, for example, are presented on page 74 of the HRS documentation record as proposed. Values assigned to substances detected in Sources 2 and 3 ranged from 20 (for xylenes) to 200 (for toluene and ethylbenzene). Substances detected in Source 1 to which much higher values were assigned included benzo(a)pyrene with a combined toxicity/persistence/bioaccumulation factor value of 5×10^8, and benzo(a)anthracene (5×10^7). As indicated on pages 81 and 82 of the HRS documentation record, these same substances received the highest values for ecosystem toxicity/persistence/bioaccumulation in the HRS evaluation of the surface water environmental threat. The actual threat posed by sources at the Sutton Brook Disposal Area will be better understood based on more extensive data collected during the remedial investigation.

1.3.3.3 EPA Discretion/Deferral

BFI commented that "EPA's proposal to list the Sutton Brook Disposal Area on the NPL is premature because EPA should first determine whether the Town of Tewksbury may remediate the Landfill in accordance with Massachusetts requirements." BFI suggested that EPA take advantage of the Town of Tewksbury's "unique knowledge of conditions at the site." It commented that "[t]here is adequate authority to effectuate a protective closure and cleanup of the Sutton Brook Disposal Area under both the Landfill Closure Requirements set forth in the Massachusetts Regulations for Solid Waste Management . . . and the Massachusetts Contingency Plan."

BFI stated further that "EPA previously recognized that conditions at the Landfill should be addressed through the cooperative efforts of the Commonwealth and the Town of Tewksbury." BFI noted for example that, "in 1997, the Director of the Board of Public Health of Tewksbury requested assistance from EPA concerning possible funding sources to support a Comprehensive Site Assessment and final closure of the Landfill. . . EPA's Region I Administrator responded that those activities appeared to fall under Subtitle D of the Resource Conservation and Recovery Act" (see BFI Exhibit C). BFI commented that EPA directed the Board to the Massachusetts DEP, saying that EPA "had limited authority to provide assistance or to intervene on Subtitle D related issues in Massachusetts."

BFI submitted a number of other exhibits to support its claim that the Town of Tewksbury has "unique knowledge" of conditions at the site. It commented that the Town authorized use of the property as the Town landfill in 1957 and later rented the property and used it as an authorized municipal waste disposal site, citing Tewksbury Board of Health meeting minutes from February 1970 and June 1971 as documentation (BFI Exhibit D). BFI commented that the Town set hours for dumping (BFI Exhibit E), restricted use of the Landfill to users within Tewksbury (BFI Exhibit F), requested that the owner oil an on-site roadway (BFI Exhibit G), and recommended that the contract between the Town and the site owner contain language allowing town vehicles free access to the landfill (BFI Exhibit H). BFI also noted that the Town "has conducted studies of the site and has unique knowledge of the conditions at, and possible remedial options for, the Landfill" (see BFI Exhibits E, I, J, K, and L, submitted as documentation).

BFI commented, finally, that "as the Final Hazard Ranking System package acknowledges, the Town, along with the Rocco family [owners of the property], was the subject of enforcement actions initiated by the Commonwealth to ensure the proper operation of the facility" (see BFI Exhibit M). BFI concluded, "[i]t is, therefore, appropriate to give the Town an opportunity to develop plans for investigating and, if necessary, remediating the Landfill." BFI expressed the belief that "[t]his approach would be consistent with EPA policy toward municipal landfills generally and EPA's preference for using state authority, rather than the NPL process, to address disposal sites."

In response, based on comments and exhibits provided by BFI, EPA sees no reason to delay listing of the Sutton Brook Disposal Area at this time. EPA's listing decision is based upon an evaluation of the site using the HRS, EPA's primary mechanism for identifying sites warranting inclusion on the NPL. In the case of the Sutton Brook Disposal Area, the evaluation revealed the release of VOCs, SVOCs, and inorganics from the site to both ground water and surface water, and identified potential ground water targets as well as human food chain and environmental targets in the surface water pathway. Nothing in BFI's comments in any way negates any of these findings as documented in the HRS documentation record as proposed.

BFI seems to suggest that, given the close relationship of the Town of Tewksbury with activities at the site and their intimate knowledge of conditions at the site, the next logical step would be to allow the Town to investigate and clean up the site. But, other than demonstrating a long history of the Town's involvement in activities at the site, BFI's comments in no way negate the Agency's listing decision.

Furthermore, listing of the Sutton Brook Disposal Area does not prohibit the Town of Tewksbury from investigating the site and undertaking response actions to address public health and environmental concerns at the site.

It is not clear whether BFI's reference to EPA's "preference for using state authority, rather than the NPL process, to address disposal sites" should be interpreted as a suggestion to invoke EPA's state deferral policy, which describes conditions under which sites might be deferred to states rather than be listed. On May 3, 1995, EPA issued *Guidance on Deferral of NPL Listing Determinations While States Oversee Response Action* (OSWER Directive 9375.6-11). In a discussion of sites eligible for deferral, that guidance states that "the State must express interest in having the site deferred to it for response. The State and EPA also should agree that the State will address the deferred site sooner than, and at least as quickly, as EPA would expect to respond." In the present case, no such interest has been expressed. To the contrary, EPA received a correspondence from Governor Celluccii of Massachusetts supporting the inclusion of the site on the NPL (NPL-U33-5-2-R1).

In general, EPA considers that deferral to a state is appropriate only if the state requests the deferral. Given that the Commonwealth of Massachusetts specifically requested that the site be listed, the Agency does not consider deferral to be appropriate for the Sutton Brook Disposal Area site.

Regarding BFI's comment concerning the EPA Region 1 Administrator's suggestion that the site be addressed under RCRA Subtitle D, that suggestion was consistent with the fact that the authority to regulate solid waste operations under RCRA Subtitle D was delegated by EPA to the Commonwealth of Massachusetts. The letter did not suggest, however, that it would not be appropriate at some point to list the site and address it under Superfund if RCRA authorities proved unsuccessful. Such is the case at the Sutton Brook Disposal Area. In any case, as noted above, EPA's deferral policy requires, at a minimum, that the state request such a deferral. The Commonwealth of Massachusetts, however, specifically requested that this site be addressed under Superfund.

1.3.3.4 Risk

BFI commented that "the available data do not show that the Landfill presents a risk to public health and the environment." In support of this claim, BFI cited page 11 of attached comments[1] and a 1992 Memorandum from the Department of Health and Human Services Agency for Toxic Substances and Disease Registry (ATSDR) that found no "immediate threat to nearby residents or those that gain access to the site for recreational purposes" (BFI Exhibit B).

In its technical comments prepared by Brown and Caldwell (BFI Exhibit A), BFI expressed the belief that "the Hazard Ranking System (HRS) provides a very conservative approach to evaluating impacts to human health and the environment." BFI continued, "[f]urthermore, the HRS, as implemented by

[1]This is an apparent reference to page 11 of BFI Exhibit A, which offers a summary of BFI's conclusions regarding the threats posed by the site to ground water and surface water targets.

Weston in the FHRSP [final HRS package], adds an additional level of conservatism such that the final scoring is not indicative of the overall site conditions or level of risk." BFI commented that the score is "driven primarily by the surface water migration pathway score" and that that score was controlled, in turn, by analytical data from sediment samples SD-3 and SD-4 taken from wetlands adjacent to the site. BFI concluded, "use of these sediment samples is not representative of the conditions within Sutton Brook." BFI explained that these samples were located approximately 400 to 500 feet from the Sutton Brook stream channel and contained "elevated levels of various polycylic aromatic hydrocarbons . . . likely attributable to direct runoff of waste materials from the landfill." It noted, however, that these substances were not present in surface water or sediment samples collected from Sutton Brook, nor in "a surface water sample from the wetland (SW-04) that was collected adjacent to sediment samples containing PAHs."

BFI commented that it is "not likely that PAHs observed in the wetland sediment samples would be mobilized such that they could impact Sutton Brook . . . due to the lack of a direct pathway (e.g., stream channel or ditch), the significant lateral distance from the wetland to the brook, and the presence of significant vegetation within the wetland including large trees. Furthermore, PAHs are relatively immobile as observed by their absence in the water column." BFI concluded that even under flood conditions, "it is unlikely that the PAHs within these wetland sediments would be mobilized such that they would enter Sutton Brook." BFI claimed that excluding these two samples (SD-03 and SD-04) "would result in a considerably reduced and more representative HRS score for the Sutton Brook Disposal Site."

BFI commented that "[t]he available data suggest that while contaminant releases have occurred, the constituent concentrations are attenuated to the point that there is no apparent risk to nearby or off-site receptors." It noted that data from numerous investigations by EPA and the Massachusetts DEP "have revealed the presence of certain constituents localized in the area of the drum disposal area" currently being removed with the resultant reduced risk to human health and the environment.

BFI acknowledged that hazardous substances have been reported in other ground water and surface water locations but claimed that "the available data reveal that off-site downgradient impacts are generally not attributable to the landfill." Regarding ground water, BFI commented that ground water in the area "flows toward and likely discharges to Sutton Brook" and that ground water quality conditions downgradient of the Sutton Brook Disposal Area indicate "an absence of or significantly reduced concentrations" of contaminants. BFI also observed that no public or private water supply wells have been impacted by the site.

Regarding surface water, BFI noted the presence of VOCs, SVOCs, and metals in "localized" surface water and sediments in Sutton Brook, but claimed that these substances are "located in close proximity to the site" and "attenuated to the point where they are not detected downstream of South Street." BFI concluded, "[t]herefore, surface water and sediment pose no apparent risk to nearby or off-site receptors."

In response, EPA appropriately evaluated the Sutton Brook Disposal Area according to the requirements of the HRS. The references cited by BFI do not negate this evaluation. BFI did not elaborate on its contention that the HRS is overly conservative. In any event, the HRS was promulgated in December 1990 after public notice and comment and is not the subject of the current rulemaking. Rather, the HRS is the principal mechanism by which the Agency identifies sites requiring additional investigation and possible remediation. The HRS is EPA's measure of risk for NPL purposes. Sites with an HRS score above the 28.50 threshold (including the Sutton Brook Disposal Area) are eligible for placement on the NPL.

In its reference to "page 11 of attached comments," EPA assumes BFI is referring to Exhibit A in which (on page 11) BFI summarizes its conclusions regarding surface water and ground water conditions at the site. These conclusions are discussed further below in this section of the support document.

ATSDR Memorandum

The memorandum from ATSDR referenced by BFI was prepared in response to an EPA request that ATSDR "determine if current conditions at the [site] . . . represent an immediate health and safety threat to the community and particularly to those that gain access to the site for recreational or other purposes." The author of the ATSDR memorandum makes clear that "[t]his consultation will serve only as an assessment of potential current hazards and threats . . . and is not intended to be used as a comprehensive health impact evaluation from any past or potential future exposures." In other words, the investigation had limited focus.

In the memorandum submitted by BFI, ATSDR concluded that "[b]ased on the results of data from 1989 sampling and from the most recent data [December 1991- January 1992], ATSDR does not believe that levels of chemical substances detected at the site (at this time) pose an immediate health threat to nearby residents or those that gain access to the site for recreational purposes." EPA does not consider this memorandum to argue against listing the site. A finding of an "immediate threat to nearby residents" may have prompted an emergency response to at least temporarily reduce the threat. That no such imminent threat was found by ATSDR does not suggest that the site poses no hazard.

The HRS documentation record establishes the presence of CERCLA hazardous substances in sources at the site and in observed releases to ground water, surface water, and surface water sediments of adjacent wetlands and Sutton Brook. As indicated on pages 54 (ground water), 74 (surface water human food chain threat), and 81 (surface water environmental threat), many of these substances were assigned the highest HRS toxicity value of 10,000. The HRS documentation record further establishes that these releases threaten human targets in the ground water pathway, as well as to human food chain and environmental targets in the surface water pathway. Page 59 of the HRS documentation record, for example, indicates the presence of more than 30,000 residents within the HRS ground water pathway target distance limit of 4 miles. As reported on page 87 of the HRS documentation record as proposed, 1.2 miles of wetland frontage are exposed to actual (Level II) contamination based on the distance from the most upstream probable point of entry to the most downstream sample indicating contamination from the site. The evaluation of the surface water environmental threat alone resulted in an HRS score sufficient to add the Sutton Brook Disposal Area site to the NPL.

Surface Water Sediment Samples

Regarding BFI's concerns about wetland sediment samples SD-03 and SD-04, BFI is in error on several counts. The use of sediment samples SD-03 and SD-04 is consistent with the HRS. The observed release to surface water is discussed on pages 65 through 72 of the HRS documentation record as proposed. Both background and downstream samples were collected and samples SD-03 and SD-04 were identified as observed release samples consistent with requirements of HRS Section 4.1.2.1.1, *Observed release* [Surface Water]. In addition to sediment samples SD-03 and SD-04, an observed release was also assigned based on surface water samples SW-02, SW-03, SW-05/06, and SW-08. These samples are located extending from sample location SW-05/06, just downstream of the most upstream probable point of entry, to a point several hundred feet downstream of the site at sample location SW-02. As a result, the observed release to surface water would have been identified even if BFI had provided convincing reasons for ignoring SD-03 and SD-04.

It should be noted that, even if samples SD-03 and SD-04 were discounted, HRS waste characteristics values would also be unaffected. HRS waste characteristics values are assigned based on all hazardous substances at a site that are available to migrate rather than just those identified in observed releases. HRS Section 2.2.3, *Identify hazardous substances available to a pathway*, instructs that this category includes both substances that meet the HRS criteria for an observed release and "[a]ll hazardous substances associated with a source with a ground water [or surface water] containment factor value greater than 0."

As indicated on pages 18 through 22 of the HRS documentation record as proposed, PAHs were identified at elevated concentrations in samples SS-02, SS-09, and SS-10 in Source 1. That this source has insufficient containment features to impede the migration of hazardous substances in the source to ground water or surface water is discussed on page 16 of the HRS documentation record as proposed. The documentation record reports, for example, that "[b]ased on historical and EPA START on-site observations, Source 1 shows no evidence of a maintained, engineered cover or a functioning and maintained run-on control management system . . . During previous investigations of Source 1, no form of containment structures were encountered that would be representative of a liner and no leachate collection and removal system is in place." Containment features are identified in HRS Tables 3-2, *Containment Factor Values for Ground Water Migration Pathway*, and 4-2, *Containment Factor Values for Surface Water Migration Pathway*.

EPA, then, appropriately based the evaluation of waste characteristics rating factors on PAHs at the site because these substances were present in both observed release samples SD-3 and SD-4 and in samples from Source 1, a source with a ground water and surface containment value greater than zero.

BFI is similarly in error when it suggests that these samples (SD-03 and SD-04) should be excluded because they are not representative of conditions in Sutton Brook. The wetlands from which these

samples and background samples were taken are part of Sutton Brook for HRS purposes[2]. As explained on page 69 of the HRS documentation record at proposal, these samples were compared to background sediment samples collected from upstream locations unaffected by the site. This is consistent with the HRS requirement that comparisons be between "similar types of samples" (see HRS Section 4.1.2.1.1, *Observed release* [Surface Water]). An important component of the HRS score for the Sutton Brook Disposal Area site is the surface water pathway environmental threat. Environmental targets are identified on pages 84 through 89 of the HRS documentation record as proposed. Page 87 of the HRS documentation record identifies 1.2 miles of wetlands along Sutton Brook as a target for the environmental threat. These wetlands are evaluated as targets consistent with HRS Section 4.1.4.3, *Environmental threat-targets*. In other words, the wetlands themselves (from which samples SD-03 and SD-04 were collected) are a significant cause of concern. In any case, the wetlands are not separate from Sutton Brook. Rather, they line Sutton Brook throughout the area of the site. That the wetlands preclude the migration of hazardous substances from the site to Sutton Brook is refuted by the presence of contaminants in downstream surface water samples.

Regarding BFI's reference to the lack of contamination in Sample SW-04, this statement is misleading because sample SW-04 was never collected. Sampling location SW-04 is identified on pages 24 and 41 of Reference 76 to the HRS documentation record (the Task Order Plan for soil, sediment, surface water, ground water, and drinking water at the site). These tables record the location and rationale and the sample type for each of the planned sampling locations for the site investigation. It is stated clearly, however, on page 74 of Reference 3 to the HRS documentation record that "SW-04 was not collected." This latter reference is the field log book for the actual investigation.

Extent of Contamination

Finally, BFI is mistaken in its claim that hazardous substances from the site "are attenuated to the point where they are not detected downstream of South Street." The 1.2 miles of wetlands evaluated in the surface water pathway environmental threat are based on the distance from the most upstream probable point of entry to Sutton Brook at the southeastern end of the site, near the Tewksbury/Wilmington town line, to Sample SW-02 located downstream of the site and several hundred feet beyond South Street (see Figure 8 in Attachment to the HRS documentation record as proposed. As indicated on page 68 of the HRS documentation record as proposed, SW-02 contained elevated concentrations of arsenic. The actual extent of contamination in Sutton Brook is not known at this time and will be the focus of future investigations.

Mobility

Regarding issues of mobility raised by BFI, as explained in Section 3.2.1 of the HRS, *Toxicity/mobility*, mobility of hazardous substances is considered for the ground water pathway by considering water solubility and distribution coefficient. Mobility values for substances at the Sutton Brook Disposal Area are indicated on page 54 of the HRS documentation record as proposed. All substances evaluated

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[2]Note that HRS Section 4.0.2 defines "rivers" as including: Perennially flowing waters from point of origin to the ocean or to coastal tidal waters, whichever comes first, *and wetlands contiguous to these flowing waters*. [emphasis added]

received the maximum mobility value of 1 because they were all present in the observed release as required in Section 3.2.1.2 of the HRS, *Mobility*.

For the mobility of substances in the surface water pathway, the Agency considers hazardous substance persistence to be a better measure of the threat posed by sites as shown in Section 4.1.2.2.1 of the HRS, [surface water] *Toxicity/persistence*. This factor reflects both the likelihood that a substance will remain in surface water over time and the tendency of the substance to sorb to sediments. As explained in the Preamble to the HRS (55 FR 51546, December 14, 1990), EPA received several comments on the proposed HRS suggesting the inclusion of sorption of substances by sediments. In response to these comments, Log K_{ow}, the logarithm of the n-octanol-water partition coefficient was added to account for sorption to sediments. As instructed in Section 4.1.2.2.1.2 of the HRS, *Persistence*, the user is to assign a persistence value based on the half-life of substances at the site unless a higher value results by using the $K_{ow.}$ For the Sutton Brook Disposal area, persistence values are indicated on page 74 of the HRS documentation record as proposed.

Ground Water

Regarding BFI's comments on ground water at the site, these comments have no bearing on the HRS evaluation of the Sutton Brook Disposal Area site. Without offering specifics as to the effects of ground water flow on the HRS evaluation, BFI commented that ground water in the area "flows toward and likely discharges to Sutton Brook." This is not inconsistent with information provided in the HRS documentation record as proposed. EPA noted on page 45 of the documentation record that "[l]eachate staining or discoloration . . . in Sutton Brook between the two lobes of the landfill (Source 1), as well as along the wetlands at the northern lobe of the landfill and along the south slope of the northern landfill . . . suggest that at least some component of ground water flow from beneath the landfill discharges to surface water." The HRS documentation record also notes, however, that regional flow appears to be in a west-southwesterly direction.

That "no public or private water wells have been impacted as a result of the site" has already been acknowledged and incorporated into the HRS evaluation of the site. As noted on page 56 of the HRS documentation record as proposed, "[c]ontamination has not been documented in any drinking water well." As a result, all ground water target factors, including nearest well and population, are evaluated as potential targets rather than actually contaminated targets. As a result, no adjustment to the HRS score is necessary.

1.3.4 Conclusion

The original HRS score for this site was 57.12. Based on the above response to comments, the score remains unchanged. The final scores for the Sutton Brook Disposal Area site are:

Ground Water	55.25
Surface Water	100.00
Soil Exposure	Not Scored
Air	Not Scored
HRS Score	57.12

REGION 2

2.1 CONSOLIDATED IRON and METAL, NEWBURGH, NEW YORK

2.1.1 List of Commenters and Correspondents

NPL-U34-3-3-1-R2	Comment dated January 25, 2001 from Clifford P. Case of Carter, Ledyard & Milburn, Counsellors at Law, representing the City of Newburgh, New York
NPL-U34-5-3-R2	Correspondence dated October 11, 2000 from John P. Cahill, Department of Environmental Conservation, Albany, New York

2.1.2 Site Description

The Consolidated Iron and Metal site is an inactive automobile and scrap metal junk yard and dealer located at the foot of Washington Street, Newburgh, Orange County, New York. The facility operated from approximately 1960 to 1999. The facility occupies approximately 7 acres of land bordering the Hudson River in a mixed industrial, commercial, and residential area. Prior to 1960, the property was used for numerous commercial and industrial purposes. An observed release to surface water has been documented by direct observation through the direct deposition of hazardous substances along the southeastern corner of the property and by flooding of soils containing hazardous substances located on the northeast corner of the property. Elevated concentrations of benzo(a)pyrene, PCBs, cadmium, chromium, lead, mercury, and zinc, attributable to the site, are documented in the Hudson River, which is a major recreation area, a fishery and a sensitive environment (i.e., state-designated water body for the maintenance of aquatic life).

2.1.3 Summary of Comments/Correspondence

John P. Cahill, of the New York Department of Environmental Conservation, expressed the State of New York's support of the placement of the Consolidated Iron and Metal site on the NPL.

Clifford P. Case of Carter, Ledyard & Milburn, Counsellors at Law, representing the City of Newburgh, New York, (the City), stated that the City supports the listing of this site because it believes that listing will lead to a quicker remediation of the property, which occupies a key location on the City's historic waterfront. However, the City disagreed with a statement in the materials supporting the listing concerning prior City involvement with the site, specifically regarding the operation of a municipal landfill at the site, that it felt could, if not corrected, lead to future City liability for site remediation.

2.1.3.1 Support for Listing

The City supported the listing of the Consolidated Iron and Metals site because it believes that listing will lead to a quicker remediation of the property, which occupies a key location on the City's historic waterfront.

In response, the Agency has added the Consolidated Iron and Metals Site to the NPL. Listing makes a site eligible for remedial action funding under CERCLA, and EPA will examine the site to determine what response, if any, is appropriate. Actual funding may not necessarily be undertaken in the precise order of HRS scores, however, and upon more detailed investigation may not be necessary at all in some cases. EPA will determine the need for using Superfund monies for remedial activities on a site-by-site basis, taking into account the NPL ranking, State priorities, further site investigation, other response alternatives, and other factors as appropriate. EPA will not stop work at some sites to begin work at other higher-scoring sites added to the NPL more recently.

2.1.3.2 Statement Accuracy and Liability

The City stated that both the NPL Site Narrative at Listing and the Hazard Ranking System Documentation Package claim, without citing any authority, that the "facility was used as the City of Newburgh's municipal landfill in the early 1900's." The City stated that it checked numerous historical documents and information sources regarding this statement and could not find any support. The City inquired with U.S. EPA representatives who could also not identify the source of this statement. The City concluded that there is "no basis for the statement," and that this "erroneous statement, which threatens to involve the City unfairly in the site remediation proceeding, must be immediately deleted, and the U.S. EPA must acknowledge that it has no information linking the City of Newburgh to the site."

In response, the Agency agrees that it has no information documenting that the City owned or operated a landfill at the Consolidated Iron and Metals site. The statements referred to by the City of Newburgh have been removed from the final versions of the Site Narrative and the HRS documentation record for the site. This incorrect statement was in the HRS documentation record in a site summary, and in no way was used in the justification of the scoring of the site. Similarly, the Site Narrative is not used in the site evaluation. The removal of this statement from both documents has no impact on the site score.

2.1.4 Conclusion

The original HRS score for this site was 50.00. Based on the above response to comments, the score remains unchanged. The final scores for the Consolidated Iron and Metal Site are:

Ground Water:	Not Scored
Surface Water:	100.00
Soil Exposure:	Not Scored
Air:	Not Scored
HRS Score:	50.00

REGION 3

3.1 LOWER DARBY CREEK AREA, DELAWARE and PHILADELPHIA COUNTIES, PENNSYLVANIA

3.1.1 List of Commenters and Correspondents

NPL-U32-5-5-R3	Correspondence dated November 19, 1999 from James M. Seif, The Secretary, Pennsylvania Department of Environmental Protection
NPL-U32-3-4-1-R3	Comment dated June 15, 2000 from Sturla Olsen, on behalf of The Boeing Company
NPL-U32-5-16-R3	Correspondence dated June 23, 2000 from David Evans, Director, State, Tribal & Site Identification Center, U.S. EPA
NPL-U32-3-4-2-R3	Comment dated July 7, 2000 from Linda A. Cartisano on behalf of Darby Creek Joint Authority
NPL-U32-3-4-3-R3	Comment dated July 10, 2000 from Benjamin G. Stonelake, Jr., Esquire, Blank Rome Comisky & McCauley LLP on behalf of the County of Delaware, Pennsylvania and Sunoco, Inc.
NPL-U32-3-4-7-R3	Comment dated June 30, 2000 from Benjamin G. Stonelake, Jr., Esquire, Blank Rome Comisky & McCauley LLP on behalf of the County of Delaware, Pennsylvania and Sunoco, Inc.
NPL-U32-5-18-R3	Correspondence dated July 6, 2000 from David Evans, Director, State, Tribal & Site Identification Center, U.S. EPA
NPL-U32-3-4-4-R3	Comment dated July 10, 2000 from James M. Seif, The Secretary, Pennsylvania Department of Environmental Protection
NPL-U32-3-4-5-R3	Comment dated July 10, 2000 from Daniel W. Cantú-Hertzler, Chief Deputy City Solicitor, City of Philadelphia Law Department
NPL-U32-3-4-6-R3	Comment dated July 8, 2000 from Leonard K. Brundage on behalf of the Citizens of Lower Darby Creek Cleanup
NPL-U32-3-4-L1-R3	Comment dated August 29, 2000 from Benjamin G. Stonelake, Jr., Esquire, Blank Rome Comisky & McCauley LLP on behalf of the County of Delaware, Pennsylvania, Sunoco, Inc., and the Darby Creek Joint Authority
NPL-U32-3-4-L2-R3	Comment dated February 28, 2001 from Benjamin G. Stonelake, Jr., Esquire, Blank Rome Comisky & McCauley LLP on behalf of the

County of Delaware, Pennsylvania, Sunoco, Inc., and the Darby Creek Joint Authority

3.1.2 Site Description

The Lower Darby Creek Area (LDCA) site as originally proposed consisted of multiple sources: the Clearview Landfill (Source 1), the Industrial Drive properties (Source 2), the Oily Sludge Disposal Area (Source 3), the Catalyst Disposal Area (Source 4), the former Delaware County Sewage Treatment Plant (Source 5), the former Delaware County Incinerator (Source 6), and the Folcroft Landfill and Annex (Source 7), releasing into the waters of Darby Creek and other nearby streams. After considering the comments addressed within this support document, EPA has decided to remove Sources 2-6 from evaluation in the LDCA HRS documentation record and to finalize the LDCA as a single listing that groups two separate sites, the Clearview Landfill and the Folcroft Landfill and Annex, for administrative purposes consistent with CERCLA 105(a)(8)(B). The Agency believes that it is appropriate that the two sites be "grouped for response priority purposes" in accordance with section 105(a)(8)(B) of CERCLA because the Agency's current intent is to address the separate sites in a coordinated fashion given that they affect the same water body. Thus, the Agency's current intent is that the sites will be given equal response priority. The Agency believes that grouping the sites under a single listing will help to convey that current intent to the public.

Both of these sites consist of hazardous substances releasing into the waters of Darby Creek documented by an observed release by direct observation. Hazardous substances of concern associated with the LDCA listing include heavy metals, polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs), and polychlorinated biphenyls (PCBs). The release of these substances into Darby Creek poses a threat to people who might consume fish from the creek, as well as an ecological threat to wetland areas and other sensitive environments.

One of the sites included in this listing is the Clearview Landfill site, which operated without a permit from the late 1950s until approximately 1973 and was used for the disposal of municipal waste. Leachate and soil samples collected from the landfill revealed the following hazardous substances: metals, PAHs, and PCBs. The Clearview Landfill is located in Delaware and Philadelphia Counties, at the confluence of Cobbs and Darby Creeks.

The other site is the Folcroft Landfill and Annex site, and was originally a privately operated landfill. It was permitted to accept municipal, demolition, and hospital wastes from approximately 1959 until 1974. State inspection reports indicate that numerous permit violations occurred during operations. Soil, leachate, and drum samples collected from the landfill revealed numerous metals, chlorinated compounds and PAHs. In 1980, the landfill area became part of the John Heinz National Wildlife Refuge (NWR). The Folcroft Landfill and Annex site is located in Delaware County.

Both sites drain to Darby Creek. Observed releases by direct observation have been documented individually from both sites into the creek. These releases to Darby Creek threaten fisheries, wetlands,

and other sensitive environments, including the John Heinz NWR at Tinicum. This 1,200-acre wildlife refuge includes a 350-acre fresh water tidal marsh, the largest in Pennsylvania. Targets associated with the creek include a fishery, wetlands, and endangered and threatened species.

3.1.3 Summary of Comments/Correspondence

James M. Seif, Secretary of the Pennsylvania Department of Environmental Protection, hereafter referred to as PADEP, concurred with EPA's decision to list the LDCA site. In a later comment, PADEP noted that there may be serious flaws in aggregating the seven sources together. It commented that it had received a Notice of Intent to Remediate from Delaware County for Source 6, the Delaware County Incinerator. PADEP commented that Delaware County has concerns about the cost to their taxpayers.

Sturla Olsen, counsel for The Boeing Company, requested an extension of the comment period.

Linda A. Cartisano, solicitor for the Darby Creek Joint Authority, hereafter referred to as DCJA, requested elimination of Source 5, the Sewage Sludge Disposal Area, from the list of sources. DCJA argued that EPA aggregated all seven sources and failed to demonstrate that DCJA contributed to the contamination. DCJA also commented it "reserves its right to supplement" its comments.

Benjamin G. Stonelake, Jr., Esquire, of Blank Rome Comisky & McCauley LLP submitted comments on behalf of the County of Delaware, Pennsylvania, and Sunoco, Inc., hereafter referred to as Delaware County and Sunoco. Delaware County and Sunoco requested an extension of the comment period. They claimed that EPA was unlawfully aggregating five of the sources to the Clearview Landfill and the Folcroft Landfill and Annex. Delaware County and Sunoco commented that CERCLA is not suited to address a watershed wide approach. They stated that the site might be better addressed under the Clean Water Act Section 303. They stated that Sunoco had taken steps to remediate Source 3, the Oily Sludge Disposal Area, and Source 4, the Catalyst Disposal Area, rendering the HRS assigned containment values for these sources outdated. They also noted that Delaware County and the Delaware County Board of Fire and Life Safety did extensive renovations at Source 6, the Delaware County Incinerator, including capping most of the areas used for the disposal of incinerator ash. Delaware County and Sunoco contested the background samples and attribution components of the observed release by chemical analysis. They also noted that EPA had not reported observed releases from Sources 2, 3, 4, 5, and 6. Delaware County and Sunoco stated that EPA and the U.S. Fish and Wildlife Service (FWS) had not performed any remedial work on Source 7, the Folcroft Landfill and Annex, when Congress authorized and directed the U.S. Department of the Interior (DOI) to acquire, preserve and restore John Heinz NWR. They also noted that no significant relationship was exhibited between benthic community structure and contaminant concentrations in the sediment, and the fish community was found to be typical of other tidal freshwater habitats in the Delaware River Basin.

In supplemental comments dated August 29, 2000, Delaware County, Sunoco, and DCJA commented that EPA ignored tidal influx from the Delaware River, which contributes to the contamination loading of

Darby Creek to a far greater degree than their properties. They commented that EPA failed to identify two other possible sources located on the John Heinz NWR. They also contended that EPA was not listing the Folcroft Landfill and Annex as a federal facility as an apparent favor to DOI/FWS.

In additional supplemental comments dated February 28, 2001, Delaware County, Sunoco, and DCJA noted that an oil spill had occurred upstream of the confluence of the Lower Darby Creek and the Delaware River, and within 24 hours this oil was pooling in Lower Darby Creek. The commenters claimed that this supported their backflushing theory. These comments also contained copies of Notices of Intent to Remediate by Sunoco, DCJA, and Delaware County.

Daniel W. Cantú-Hertzler, Chief Deputy City Solicitor, City of Philadelphia Law Department, commented on behalf of the City of Philadelphia. The City of Philadelphia requested an extension of the comment period. It stated that EPA improperly aggregated various sources at the LDCA. The City of Philadelphia noted that the area would not benefit from being listed on the NPL, and suggested that a watershed management approach would be better suited for the site. It also indicated that deferral to the state might also be more appropriate for the LDCA site. The City of Philadelphia contended that the proposed NPL listing does not address the primary concerns of the residents of the Eastwick neighborhood. It also noted that an NPL listing would require a "massive infusion of public money. . . ." The City of Philadelphia commented that the data EPA relied on to establish the waste characteristic values are open to serious question. It also stated that no data supported the contention that contaminants in Darby Creek have impacted people, fish, or wildlife.

Leonard K. Brundage submitted comments on behalf of the Citizens of Lower Darby Creek Cleanup. The Citizens of Lower Darby Creek submitted a petition style document with 61 signatories. They requested information relating to why their homes were allowed to be built there and information relating to the operation of the Clearview Landfill.

3.1.3.1 Requests for an Extension

The Boeing Company (Boeing), Darby Creek Joint Authority (DCJA), Delaware County, Sunoco, and the City of Philadelphia requested a 60-day extension to the comment period for reasons documented below.

On June 15, 2000, Boeing requested a 60-day extension to the comment period, because they only recently had become aware that they were identified as a "potential source." Boeing indicated they have not had sufficient time to fully evaluate the data and prepare comments due to the absence of several key decision makers, the complexity of the issues, and only becoming recently aware of the proposed listing.

DCJA commented that it "reserves its right to supplement" its letter with further documentation for its "elimination" from the list. It further indicated that it was performing sample testing of materials at

Source 5, the sewage sludge disposal area, as well as upstream and downstream of the source. DCJA stated further information and documentation will be forwarded on DCJA's position.

Delaware County and Sunoco requested that EPA grant them an extension of time to file comments until the latter of either September 10, 2000, or 60 days after EPA responded to their Freedom of Information Act (FOIA) request. The FOIA request was submitted on March 1, 2000, and sought all relevant information relating to the "Alleged Sources" and EPA's announcement of its intention to propose the site for NPL listing. They noted that EPA made a partial production of responsive documents available for inspection on May 19, 2000, and a second set of responsive documents was made available by EPA on June 30, 2000.

Delaware County and Sunoco expressed concern that information within the "scope of the FOIA request" will show or support their claims that "EPA's proposed rule is arbitrary and capricious, and that EPA has abused its discretion or otherwise acted in a manner inconsistent with applicable law." In addition, they indicated that EPA has failed to conduct the appropriate studies of the Darby Creek drainage basin, and EPA's "sudden rush" to impose a CERCLA approach requires "careful scrutiny to avoid further delay in developing a comprehensive water quality management plan for the entire Darby Creek drainage basin."

Delaware County and Sunoco stated that the Administrative Procedure Act, 5 U.S.C. § 552, specifically requires EPA to respond to requests for information promptly. They indicated that a District Court may stay an administrative proceeding, such as this proposed rulemaking, when relevant information has been requested and has not been produced in a timely fashion.

In addition, Delaware County and Sunoco contended that, generally, "the FOIA contemplates that the Government will respond to requests for information within twenty days. 5 U.S.C. § 552(a)(6)(A)(I)." They noted that it took EPA approximately four months to make "a purportedly complete response" to the FOIA request. They contended that they have been "prejudiced by EPA's unwarranted delay as the parties did not obtain a complete set of the EPA's responsive documents until ten days before the due date for comments to the EPA's proposed rule." Delaware County and Sunoco suggested that the only "appropriate cure" for this delay is to give them an extension of 60-days from the receipt of the completed FOIA response to submit final comments on this proposed rule making without prejudice to their right to submit additional comments. Accordingly, Delaware County and Sunoco renewed their request for a 60-day extension.

On July 10, 2000, the City of Philadelphia also requested a 60-day extension of time to secure independent technical analysis and supplement the City's comments. This request was based on several factors. The City claimed that it has not had time to have the information reviewed by an environmental consulting firm; delays by EPA Region III in producing information[1] (though apparently inadvertent)

[1] The City cited this example of a delay; "EPA failed to provide a copy of the chief Roy F. Weston report on the site when initially requested, and incorrectly represented that its prior HRS scoring of segments of the proposed site would be included in the HRS docket for the Lower Darby Creek Area site."

have hampered the City in its efforts; and the proposed 60-day extension falls within the time period in which EPA will respond to public comments and will not cause a substantial delay in EPA's ultimate decision.

Sunoco, Delaware County and DCJA submitted supplemental late comments on August 29, 2000, and February 28, 2001. (The closing date for comments on the LDCA was July 10, 2000.) They stated that these late comments are warranted as a result of EPA's extended delay in providing relevant documents in response to their FOIA request.

In response, EPA determined an extension to the comment period was not necessary and that all information necessary to review the proposed listing was provided in a timely manner. As a result, EPA rejected all requests for an extension of the comment period. In letters to these commenters, Dave Evans, Director, State, Tribal & Site Identification Center, explained:

> EPA placed all information used in the proposal determination in the appropriate rulemaking dockets as outlined in the preamble to the Federal Register notice proposing the Lower Darby Creek Area site. The County [of Delaware] and Sunoco had access to all information used to score the LDCA site. . . . . EPA's policy is to extend the comment period only in cases where the materials placed in the docket to support the proposal were incomplete or otherwise not in order, such as missing references. In the case of the public docket for the Lower Darby Creek Area site, there were no procedural errors nor were any documents that EPA relied on for the proposal missing from the docket. Since all of the information that EPA used in making its decision to propose the site has been available to the commenters since the date of proposal, there is no valid reason to extend the comment period. . . . (See NPL-U32-5-16-R3 and NPL-U32-5-18-R3)

EPA received late comments dated August 29, 2000 and February 28, 2001, from Benjamin G. Stonelake, Jr. of Blank Rome Comisky & McCauley LLP on behalf of the County of Delaware, Sunoco, and DCJA. EPA has a policy of not delaying a final listing decision solely to accommodate consideration of late comments (65 FR 30489, May 11, 2000). While the Agency endeavors to consider late comments, it is not required to do so. All late comments received on the LDCA were, in fact, considered by the Agency.

3.1.3.2 Site Definition

Several comments were received from Delaware County and Sunoco, PADEP, the City of Philadelphia, and DCJA that questioned how the site was defined in the proposed HRS documentation record. Specifically, Delaware County and Sunoco, PADEP, the City of Philadelphia, and DCJA commented on the legality of combining all seven sources as a single site, the consideration of current conditions, the contribution of several of the sources to the contamination in the Creek, other possible sources, tidal effects and the negative impact of the inclusion of source 6 as part of the LDCA site. Below is a summary of these comments. As will be explained following each summary, these comments are not relevant to the listing of the LDCA as promulgated.

Extent of Site

Several commenters objected to EPA's proposed NPL listing of the LDCA as a grouping of seven sources, in general, and objected to inclusion of specific sources in the site.

Delaware County and Sunoco objected to the listing of the seven sources as a single site, claiming that: (1) they are very different facilities; (2) they have very different types and quantities of contamination; (3) they pose vastly different types and degrees of risk to the LDCA; and (4) taken together they contribute, at most, only a "de minimis" amount of contamination to an area that receives literally tons of pollution from many other sources each year. Delaware County and Sunoco stated specifically, regarding sources on their properties, that it is arbitrary and capricious for the EPA to aggregate Delaware County and Sunoco properties with the other "Alleged Sources," to create one Superfund site known as the Lower Darby Creek Area, and if they were to do so, the site must include all major sources of contamination to the LDCA which it failed to do. In addition, they stated that any "listing that cannot be individually justified by reference to EPA's risk or state designation criteria is unlawful. See Mead Corp. v. Browner, 100 F. 3d 152, 155 (D.C. Cir. 1996)." Delaware County and Sunoco noted that EPA has only reported observed releases to surface water from the Clearview Landfill and the Folcroft Landfill and Annex (Sources 1 and 7). They further stated that "[i]f it were appropriate to do so, EPA could assign an individual HRS score exceeding 28.5 to each of these two Sources [Clearview Landfill and Folcroft Landfill and Annex] and list each of them as separate NPL sites." Delaware County and Sunoco commented that EPA had not reported observed releases from any of the other alleged sources (Sources 2, 3, 4, 5, and 6) and that EPA cannot lawfully aggregate these five alleged sources to the Clearview Landfill and/or Folcroft Landfill and Annex sites as a single NPL site unless each of them qualifies for an HRS score that equals or exceeds 28.50.

Delaware County and Sunoco also commented that the HRS documentation record at proposal demonstrates that the Folcroft Landfill and Annex, Source 7, has had a much more significant impact on the LDCA than the properties owned by Delaware County and Sunoco. They stated that it is "indisputable that the United States was well aware of the contaminated nature of the Folcroft Landfill and Annex at the time it decided to add this facility to the Refuge." Delaware County and Sunoco noted that Source 7 has been a known threat for some time now. They asserted, based on the United States' long knowledge of the contamination at this facility and its failure to take any remedial action over its twenty years of ownership, it is arbitrary and capricious to link the Folcroft Landfill and Annex to their properties by listing this as one Superfund site.

The City of Philadelphia stated that EPA has improperly aggregated seven diverse source sites, each of which appears to have reasonably distinct problems that vary substantially in kind and in degree and that the circumstances suggest that the aggregation of these distinct sites would be improper for purposes of NPL listing.

PADEP also expressed its concern that there may be "serious flaws" in the reasoning behind aggregating the sources at LDCA.

DCJA stated that "EPA has not segregated the sources of the contamination. It has aggregated all 7 sources even though the sources are unrelated, do not share a common history, are not contiguous, operations are different, and the sources of contamination are unrelated." DCJA requested that Source 5, the sewage sludge disposal area, be eliminated from the list because EPA failed to demonstrate that the DCJA sewage treatment plant had contributed to the contamination in the Lower Darby Creek and the sewage treatment plant is not an ongoing or continuing source of contamination.

In their supplemental comments, Sunoco, Delaware County, and DCJA contended that EPA failed to identify two other possible sources that may be contributing significantly to the LDCA site, the former Norwood Landfill and Cusano Environmental Education Center (CEEC), both located within the John Heinz NWR and both significantly contaminated. They considered the Norwood Landfill a more serious threat to the refuge than their properties. They stated that it was inappropriate for EPA to address the LDCA by targeting selected property owners given the numerous point and nonpoint sources. They considered that not identifying these two sources but including their properties in the listing demonstrated either that none of the properties had any material impact on the Refuge or extreme bias and discriminatory action, and would be arbitrary and capricious and otherwise inconsistent with the NCP.

In response, based on a review of the concerns raised by these commenters, EPA has decided to remove the Industrial Drive Properties (Source 2), the oily sludge disposal area (Source 3), the catalyst disposal area (Source 4), the sewage sludge disposal area (Source 5), and the former Delaware County Incinerator Landfill (Source 6) from the sources evaluated as part of the LDCA listing. EPA has restructured the proposed LDCA site to consist of a single listing, containing two separately scored sites, the Clearview Landfill site and the Folcroft Landfill and Annex site. The comments alleging aggregation are no longer germane to the LDCA listing, based on the restructuring of the LDCA into two separately scored sites.

The Clearview Landfill and Folcroft Landfill and Annex warrant further investigation. The proposed HRS documentation record contains information that demonstrates both the Clearview Landfill (former Source 1) and the Folcroft Landfill and Annex (former Source 7) score above 28.50 individually; however, EPA has decided at this time to group them under the LDCA site name as a single listing of two sites (Clearview Landfill site and Folcroft Landfill and Annex site). According to CERCLA Section 105 (a)(8)(B), ". . . priority facilities or incidents may be listed singly or grouped for response priority purposes." The Agency believes that it is appropriate that the two sites be "grouped for response priority purposes" in accordance with section 105(a)(8)(B) of CERCLA because the Agency's current intent is to address the separate sites in a coordinated fashion given that they affect the same water body. Thus, the Agency's current intent is that the sites will be given equal response priority. The Agency believes that grouping the sites under a single listing will help to convey that current intent to the public. Since the Clearview Landfill and the Folcroft Landfill and Annex qualify for listing as separate sites and proposed Sources 2-6 are being removed from the LDCA scoring, the comments alleging improper aggregation of

these sources with Clearview Landfill and Folcroft Landfill and Annex are no longer relevant. See discussions below of the individual scoring of the Clearview Landfill and the Folcroft Landfill and Annex. (See also the revised documentation record for the Clearview Landfill site and the Folcroft Landfill and Annex site.[2])

Clearview Landfill Individual Site Score

The individual HRS scoring for the Clearview Landfill site is summarized below.

Source Characterization

The Clearview Landfill source characterization remains unchanged from the proposed documentation record. The same containment, hazardous substances, and hazardous waste quantity (HWQ) value still apply for the Clearview Landfill.

Likelihood of Release

The Clearview Landfill is associated with an observed release by direct observation to surface water based on the observation of leachate containing hazardous substances releasing directly into Darby Creek. This establishes a likelihood of release factor value of 550 (see page SW-87 of the HRS documentation record at proposal and page 34 of the revised HRS documentation record).

Waste Characteristics

The Source HWQ value based on area is 832.76 for this landfill (see page 27 of the HRS documentation record at proposal and page 29 of the revised HRS documentation record), which yields a pathway HWQ factor value of 100 (HRS Table 2-6, *Hazardous Waste Quantity Factor Values*). The following hazardous substances documented in the Clearview Landfill have the highest toxicity/persistence/bioaccumulation (T/P/B) factor value of $5x10^8$: benzo(a)pyrene, indeno(1,2,3-cd)pyrene, Aroclor-1248, Aroclor-1254, and Aroclor-1260 (pages SW-115 and 116 of the HRS documentation record at proposal and pages 37 and 38 of the revised HRS documentation record).

These factor values yield a waste characteristics factor value for the human food chain threat of 320 (see HRS Section 2.4.3, *Waste characteristics factor category value* and HRS Table 2-7, *Waste Characteristics Factor Category Values*).

Targets

Darby Creek is classified as a fishery for the entire target distance limit (Reference 80 of the HRS documentation record). The human food chain target value assigned for the food chain individual is 45. Section 4.1.3.3.1 of the HRS, *Food chain individual* states that if "[a]ny fishery (or portion of a fishery) is subject to Level II concentrations, assign a value of 45." Section 4.1.3.3 of the HRS, *Human food*

[2]A copy of the revised documentation record for the LDCA listing is available at EPA Region 3 docket and EPA Headquarters docket.

chain threat-targets, instructs the user to consider a fishery (or portion of a fishery) within the target distance limit to be subject to actual human food chain contamination if:

> A hazardous substance having a bioaccumulation potential factor value of 500 or greater is present either in an observed release by direct observation to the watershed or in a surface water or sediment sample from the watershed at a level that meets the criteria for an observed release to the watershed from the site, and at least a portion of the fishery is within the boundaries of the observed release (that is, it is located either at the point of direct observation or at or between the probable point of entry and the most distant sampling point establishing the observed release).

Cadmium, copper, and zinc have bioccumulation potential factor values of greater than 500 and were documented in the observed release by direct observation from the Clearview Landfill into Darby Creek (see pages SW-87 and SW-115 of the HRS documentation record at proposal and pages 41-42 of the revised HRS documentation record). Section 4.1.3.3.2 of the HRS, *Population,* instructs the user to evaluate population of the fishery based on whether the fishery is subject to Level I, Level II, or potential contamination.

Section 4.1.3.3, *Human food chain threat targets,* of the HRS states: "[i]f the actual food chain contamination is based on direct observation, evaluate it using Level II concentrations." Therefore, Darby Creek is subject to Level II contamination. Section 4.1.3.3.2.2 of the HRS, *Level II concentrations,* instructs the user to: "[a]ssign each fishery (or portion of a fishery) a value for human food chain population from Table 4-18 based on the estimated human food production for the fishery." Fish are caught in Darby Creek, but no data on the pounds of fish or number of fish caught per year have been identified; therefore, the annual production in pounds for Darby Creek is greater than zero (see pages SW-123 of the HRS documentation record at proposal, page 43 of the revised HRS documentation record, and Reference 80 of the HRS documentation record, *Record of Telephone Conversation Regarding Fishing in Darby Creek and Red-Bellied Turtles*). According to HRS Table 4-18 *Human Food Chain Population Values,* annual production in the range of greater than 0 to 100 pounds receives an assigned value of 0.03. Section 4.1.3.3.3 of the HRS, *The human food chain threat-targets factor category value,* instructs the user to sum the food chain individual and population factor values for the watershed. The human food chain threat-targets factor category value for Clearview Landfill is 45+0.03=45.03. Therefore, the human food chain threat score for the surface water pathway is (likelihood of release * waste characteristics * targets)/82,500 or (550*320*45.03)/82,500 = 96.06 (Section 4.1.3.4 of the HRS, *Calculation of human food chain threat score for a watershed*).

The surface water environmental threat is not scored for the Clearview Landfill. The documentation available on environmental targets only identifies these targets as subject to potential contamination, and the resulting HRS threat score would not significantly affect the overall site score.

This yields a site score for the Clearview Landfill of (the square root of the square of the pathway scores divided by 4) or $\sqrt{[(0+96.06^2+0+0)/4]} = 48.03$ (Section 2.1.1 of the HRS, *Calculation of HRS site score*). See revised HRS documentation record for the Clearview Landfill site[3].

Folcroft Landfill and Annex Individual Site Score

The individual HRS scoring for the Folcroft Landfill and Annex site is summarized below.

Source Characterization

The Folcroft Landfill and Annex source characterization remains unchanged from the proposed documentation record. The same containment, hazardous substances, and HWQ value still apply for the Folcroft Landfill and Annex.

Likelihood of Release

The Folcroft Landfill and Annex site has an observed release by direct observation based on the observation of leachate seeps entering Darby Creek and Tinicum Marsh, and the observation of waste material from the landfill being pushed into Darby Creek, resulting in a likelihood of release value of 550 for the surface water pathway (see pages SW-87 - SW-89 of the HRS documentation record at proposal and pages 70-72 of the revised HRS documentation record).

Waste Characteristics

The source HWQ value based on area is 819.95, which results in an assigned pathway HWQ factor value of 100 (see page 73 of the HRS documentation record and HRS Table 2-6, *Hazardous Waste Quantity Factor Values*). The following hazardous substances, documented in the Folcroft landfill and Annex, have the highest T/P/B factor value of $5x10^8$: benzo(a)pyrene and indeno(1,2,3-cd)pyrene (pages SW-115 and 116 of the HRS documentation record at proposal and pages 74 and 75 of the revised HRS documentation record). The following hazardous substances were documented in Folcroft landfill and Annex and have the highest ecosystem T/P/B factor value of $5x10^8$: benzo(a)anthracene and benzo(a)pyrene (page SW-128 of the HRS documentation record at proposal and pages 83 and 84 of the revised HRS documentation record).

These factor values yield a waste characteristics factor value of 320 for both the human food chain threat and the environmental threat (see Section 2.4.3, *Waste characteristics factor category value* and HRS Table 2-7, *Waste Characteristics Factor Category Values*).

Targets

Darby Creek is classified as a fishery for the entire target distance limit (Reference 80 of the HRS documentation record). The human food chain target value assigned for the food chain individual is 45.

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[3]A copy of the revised documentation record for the LDCA listing is available in the EPA Region 3 docket and EPA Headquarters docket.

Section 4.1.3.3.1, *Food chain individual* of the HRS states that if "[a]ny fishery (or portion of a fishery) is subject to Level II concentrations assign a value of 45." Section 4.1.3.3 of the HRS, *Human food chain threat-targets,* instructs the user to consider a fishery (or portion of a fishery) within the target distance limit to be subject to actual human food chain contamination if:

> A hazardous substance having a bioaccumulation potential factor value of 500 or greater is present either in an observed release by direct observation to the watershed or in a surface water or sediment sample from the watershed at a level that meets the criteria for an observed release to the watershed from the site, and at least a portion of the fishery is within the boundaries of the observed release (that is, it is located either at the point of direct observation or at or between the probable point of entry and the most distant sampling point establishing the observed release).

Cadmium, copper, and zinc have bioaccumulation potential factor values of greater than 500 and were documented in the observed release by direct observation for the Folcroft Landfill and Annex into Darby Creek (see pages SW-87, SW-88, SW-89, and SW-115 of the HRS documentation record at proposal and page 79 of the revised HRS documentation record).

Section 4.1.3.3.2 of the HRS, *Population,* instructs the user to evaluate population of the fishery based on whether the fishery is subject to Level I, Level II, or potential contamination. Section 4.1.3.3, *Human food chain threat targets,* of the HRS states: "[i]f the actual food chain contamination is based on direct observation, evaluate it using Level II concentrations." Therefore, Darby Creek is subject to Level II contamination. Section 4.1.3.3.2.2 of the HRS, *Level II concentrations,* instructs the user to: "[a]ssign each fishery (or portion of a fishery) a value for human food chain population from Table 4-18 based on the estimated human food production for the fishery." Fish are caught in Darby Creek, but no data on the pounds of fish or number of fish caught per year have been identified; therefore, the annual production in pounds for Darby Creek is greater than zero (see page SW-123 of the HRS documentation record at proposal, page 80 of the revised HRS documentation record, and Reference 80 of the HRS documentation record, *Record of Telephone Conversation Regarding Fishing in Darby Creek and Red-Bellied Turtles*). According to Table 4-18, *Human Food Chain Population Values,* annual production in the range of greater than 0 to 100 pounds receives an assigned value of 0.03. Section 4.1.3.3.3 of the HRS, *The human food chain threat-targets factor category value,* instructs the user to sum the food chain individual and population factor values for the watershed; again the result is 45.03. Therefore, the human food chain threat score for the surface water pathway is (likelihood of release * waste characteristics * targets)/82,500 or (550*320*45.03)/82,500 = 96.06 (Section 4.1.3.4 *Calculation of human food chain threat score for a watershed*).

In evaluating the surface water environmental threat for the Folcroft Landfill and Annex, Section 4.1.4.3.1, *Sensitive environments,* of the HRS instructs the user to determine if the sensitive environment is subject to Level I, Level II, or potential contamination as specified in Section 4.1.2.3, *Drinking water threat-targets*; this section states that if the actual contamination is based on an observed release by direct observation, use Level II contamination. These targets are subject to Level II contamination because the observed release by direct observation is directly into the John Heinz NWR at Tinicum. (Folcroft Landfill and Annex are located in the NWR, see page SW-135 of the HRS documentation record at proposal and page 90 of the revised HRS documentation record.) The targets and assigned

values for the environmental threat are: a National Wildlife Refuge[4]; habitat known to be used by two Federal designated or proposed endangered or threatened species[5]; and habitat known to be used by three State designated or proposed endangered or threaten species[6] (see page SW-135 of the proposed HRS documentation record, page 90 of the revised HRS documentation record, and HRS Table 4-23, *Sensitive Environments Rating Values*). The environmental threat targets value is 375 (see HRS Section 4.1.4.3.1.4, *Calculation of environmental threat-targets factor category value*).

The surface water environmental threat score is (likelihood of release * waste characteristics * targets)/82,500 or (550*320*375)/82,500 = 800, and is subject to a maximum of 60 for that threat (see HRS Section 4.1.4.4, *Calculation of environmental threat score for a watershed)*. The human food chain threat score combined with the environmental threat score results in a surface water pathway score of 100.00 (96.06+60=156.06, subject to a maximum of 100, see HRS Section 4.1.5, *Calculation of overland/flood migration component score for a watershed*).

Therefore, the site score for the Folcroft Landfill and Annex is (the square root of the square of the pathway scores divided by 4) or $\sqrt{[(0+100^2+0+0)/4]} = 50.00$ (Section 2.1.1, *Calculation of HRS site score,* of the HRS). (See the revised Folcroft Landfill and Annex site HRS documentation record[7].)

Sources/Current Conditions

Delaware County and Sunoco asserted that EPA had improperly characterized conditions at several of the seven sources in the LDCA at proposal. They described the conditions that exist at each of the seven sources at the LDCA. They commented specifically on the ground water and the containment conditions at Sources 3 and 4 and the containment of Source 6.

Delaware County and Sunoco noted that at Sources 3 and 4, they had undertaken a voluntary remediation of the two feet of crude oil found floating in 1986 on top of the water table, and Sunoco continues to operate a groundwater monitoring system at the tank farm. (Source 3, the Oily Sludge Disposal Area and Source 4, the Catalyst Disposal Area are located on the tank farm.) Delaware County and Sunoco contended that virtually "all of the Tank Farm is covered by relatively impermeable cover soils that have a permeability ranging between 10^{-5} and 10^{-8} cm/sec, including the soils within the Oily Sludge Disposal Area." Delaware County and Sunoco stated that EPA incorrectly assigned a containment factor value of 10 to Sources 3 and 4, the Oily Sludge Disposal Area and the Catalyst Disposal Area, respectively, because the waste is isolated and contained by impermeable soils and surrounded by a series of berms that prevent upstream surface water run-on from contacting this area; these features collect all runoff

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[4]John Heinz NWR at Tinicum, 75

[5]red-bellied turtle, 75; and southern leopard frog, 75

[6]American bittern, 50; least bittern, 50; and great egret, 50

[7]A copy of the revised documentation record for the LDCA listing is available in the EPA Region 3 docket and EPA Headquarters docket.

within this area and direct it to a storm water management system that discharges from an outfall authorized by an NPDES permit. They stated that this is the only surface water discharge from Sunoco's Darby Creek Tank Farm and that, in May 1999, EPA sampled this outfall and did not detect any of the contaminants associated with the LDCA that were "materially different from background concentrations."

Delaware County and Sunoco commented that beginning in 1990, at Source 6, the Delaware County Incinerator, Delaware County and the Delaware County Board of Fire and Life Safety did extensive renovations to the main incinerator building, demolished appurtenances to the main building and removed equipment. These renovations were performed to convert the main building into a training center. Delaware County also commenced a comprehensive "Brownfields" restoration of the property. Delaware County has capped large portions of the property and redeveloped it as Delaware County's Emergency Services Training Center, which provides training to Delaware County and municipal police, firefighters, and other emergency services personnel. They stated that Delaware County is currently capping another section of the facility; when this is completed, Delaware County will have capped most of the facility that was used to dispose incinerator ash. Delaware County and Sunoco also indicated that "[p]eople who use or visit the Training Center are not exposed to the ash."

Sunoco, Delaware County, and DCJA submitted additional comments dated February 28, 2001. The comments contain copies of Notices of Intent to Remediate by Sunoco, DCJA, and Delaware County.

In response, as explained above, EPA has removed Sources 2-6 and restructured the proposed LDCA to consist of a single listing containing two separately scored sites, the Clearview Landfill and the Folcroft Landfill and Annex. Therefore, the conditions that exist at sources 2-6 are no longer relevant to the LDCA listing.

Regarding the comments dated February 28, 2001, EPA has not responded specifically to these comments due to the removal of Sources 2-6 from the LDCA scoring. The comments raise no new issues and are covered under issues already discussed in this section of the support document. The commenters' sources have been removed from the LDCA scoring and now have no bearing on the decision to proceed with the promulgation of LDCA as a listing of two separate sites.

Effect of Listing Source 6

The PADEP commented that Delaware County has legitimate concerns about the costs to their taxpayers and the need to maintain the important services offered at the Emergency Services Training Center located at Source 6, the Delaware County Incinerator, "especially in light of the long delays and increasing costs that are inevitable under the federal Superfund program." In addition, PADEP stated that while "federal CERCLA authorities may ultimately be appropriate for addressing the complex contamination affecting this area, we would note that federal funding may be necessary also, because of the sites' ownership and history."

In response, as explained above, EPA has at this time removed Sources 2-6 and restructured the proposed LDCA to consist of a single listing containing two separately scored sites, the Clearview Landfill and the Folcroft Landfill and Annex. Therefore, the possible effects of listing source 6 have no bearing on the decision to list the LDCA.

Regarding economic effects and delay, no evidence has been provided, and EPA is unaware of any, to support their speculation that the listing would have various adverse social and economic effects on their property or any other property. EPA does not think it appropriate to delay addressing the serious health and environmental issues presented by the site based on mere speculation. The NPL serves primarily as an informational list. Inclusion of a site or facility on the list reflects EPA's judgment that a significant release or threat of release has occurred, and that the site is a priority for further investigation under CERCLA. Furthermore, the focus of the CERCLA program is to identify and, where necessary, address hazardous substances releases that may pose a threat to health or the environment.

Observed Release/Background/Attribution

Delaware County and Sunoco commented that EPA has not reported observed releases from Sources 2, 3, 4, 5, and 6, and that the HRS documentation record acknowledged that there was no evidence of releases to Lower Darby Creek or evidence of migration from these sources.

Delaware County and Sunoco contended that EPA has attempted to rely on “purported ‘background’ data for comparison to samples obtained from the Alleged Sources.” They stated that EPA’s concept of background for the LDCA is arbitrary and capricious because it ignores the actual conditions in this area created as a result of: (1) the heavy sediment loading from upstream sources, (2) the back flushing of contaminated sediments from the Delaware River as a consequence of daily tidal forces, and (3) the chronic effects of the erosion and leaching of the hundreds of acres of dredge spoils present in the John Heinz NWR.

Delaware County and Sunoco noted that the Delaware River dredge spoils, placed at the John Heinz NWR between 1956 and 1958, have higher metals concentrations than the sediment sample collected from the center of Source 6, Delaware County Incinerator Landfill. They also stated that the total point and non-point sediment contribution (Camp, Dresser and McKee model for the City of Philadelphia) from upstream is so large that the “Alleged Sources on Delaware County and Sunoco properties is extremely de minimis in comparison to the upstream sources.”

DCJA contended that the contaminants attributed to Source 5, the sewage sludge disposal area, are present in upstream sources at higher concentrations, and EPA has failed to demonstrate that the sources of contamination are related to Source 5 or even attributable to the Delaware County Sewage Treatment Plant, where the sewage sludge disposal area is located. It also stated that the plant has been inactive since “circa 1972.”

Sunoco, Delaware County, and DCJA submitted supplemental comments and information on the tidal contribution and the impact of storm water runoff. They remarked that EPA deliberately ignored tidal influx from the Delaware River, when the river contributes to the contamination loading of Darby Creek to a far greater degree than their properties.

Sunoco, Delaware County, and DCJA submitted additional comments dated February 28, 2001. These comments pertain to an oil spill that occurred in the Delaware River, which the commenters claim support their theory of back flushing. The commenters noted that the "backflushing hypothesis" was confirmed by the recent oil spill on the Delaware River in January. They indicated that within twenty-four hours of the oil spill approximately nine miles upstream on the Delaware River, oil from the spill was "pooling in a natural containment point" in the Lower Darby Creek. The commenters stated that EPA should not focus on their properties "because the daily tidal influx of suspended contaminants and contaminated sediments from the Delaware River into the Lower Darby Creek vastly exceeds any predicted discharge of contaminants from the Respondents' properties."

In response, as previously explained, EPA has restructured the proposed LDCA to consist of a single listing containing two separately scored sites, the Clearview Landfill and the Folcroft Landfill and Annex. EPA has not included an observed release by chemical analysis to Lower Darby Creek in the scoring of either the Clearview Landfill site or the Folcroft Landfill and Annex site. While establishing an observed release by chemical analysis involves establishing a background concentration and attribution, establishing an observed release by direct observation does not. The sampling data collected in Lower Darby Creek between the Clearview Landfill and the Folcroft Landfill and Annex, however, is included in the Listing Introduction for the LDCA package as supporting information that the entire watershed is contaminated. Because the observed releases at Clearview Landfill and Folcroft Landfill and Annex were established by direct observation, the contribution of contaminants to Lower Darby Creek from other sources, including tidal influx, has no bearing on the evaluation of any HRS Factor or the listing decision.

Observed releases from Clearview Landfill and Folcroft Landfill and Annex, are identified based on direct observation (see pages 34 and 70-72 of the revised HRS documentation record and the above section in this support document). As stated earlier, these identifications do not require establishment of background or attribution. Section 4.1.2.1.1, *Observed release*, of the HRS instructs the user to base the demonstration of an observed release by direct observation on "[a] material that contains one or more hazardous substances has been seen entering surface water through migration or is known to have entered surface water through direct deposition. . . ." Hence, comparison to a background level or attribution is not needed for observed release by direct observation; visual observation of the material containing hazardous substances entering the surface water body is sufficient. Therefore, because Sources 2-6 have been removed from the LDCA and the observed release is based on direct observation, the above comments are no longer relevant to the scoring of the LDCA as promulgated. For the same reason, late comments on back flushing are not relevant.

Regarding the comment that the Agency should focus on other sources of contamination to Darby Creek which, according to commenters, contribute to the contamination loading more than the sources identified in the proposed listing, EPA is focusing on Clearview Landfill and Folcroft Landfill and

Annex at this time because EPA's investigation of these sources indicates that they warrant further attention. Observed release by direct observations have been documented from both of these landfills. The listing of the LDCA site does not preclude later identification of other sources of contamination that may warrant attention. Further, as stated in section 3.1.3.3 of this support document, *Alternatives to Listing*, the Agency may consider, in future analysis, if a watershed approach, or any other approach is the most appropriate action for the LDCA The listing promulgated today does not preclude use of other authorities or approaches to addressing contamination in Lower Darby Creek, including an approach under section 303 of the Clean Water Act.

3.1.3.3 Alternatives to Listing

Several commenters objected to the use of Superfund authority to remediate all or parts of the LDCA and suggested alternative mechanisms for doing so.

Clean Water Act/Watershed Approach

Delaware County and Sunoco commented that EPA's proposed listing is "perplexing because, over the past 28 years, EPA has failed to pursue a comprehensive water quality management study of Darby Creek as required by Section 303 of the Clean Water Act, as amended 33 U.S.C. §1313." Sunoco and Delaware County also asserted that it is arbitrary and capricious for EPA to conduct or require any remediation of Darby Creek or the John Heinz NWR before it conducts a comprehensive study of all discharges to this area, prohibits, restricts or otherwise regulates all future discharges from these sources, remediates all existing contamination in upstream segments that will otherwise migrate into this area, and assesses the future impact that back flushing of Delaware River sediments would have on any remedy selected for the LDCA. Delaware County and Sunoco stated that they would not oppose any justifiable request that they investigate or remediate contamination on their individual properties, and that they have already performed voluntary remedial work on their properties. However, they do object to EPA's current proposal.

Delaware County and Sunoco commented that EPA's proposal to impose the obligation to study and perhaps, remediate contamination on their properties would be "a taking of private property for a public purpose without just compensation; would violate Congress' mandate in the Clean Water Act that EPA conduct such surface water planning and management studies; would violate Congress' instruction that the FWS restore the Tinicum Marsh; and would also be inconsistent with CERCLA and the NCP because, in contrast to the FWS, which has not restored Source 7, Folcroft Landfill and Annex, on its property or even maintained controls that existed when it purchased the Folcroft Landfill and Annex, Delaware County and Sunoco are actively restoring and managing potential contaminant sources at their individual facilities." In addition, Delaware County and Sunoco stated that CERCLA is not suited to address a watershed-wide issue, and that it is "absolutely essential that a comprehensive watershed-wide approach, including a Clean Water Act study of sediment fate and transport, be implemented for the entire 79 square mile watershed, including the LDCA."

The City of Philadelphia recognized that the entire area proposed for inclusion on the NPL is "environmentally challenged"; however, the area is not at all homongeneous, and would not benefit from

HRS scoring or from remediation that pretends as if it were. It also stated that in the absence of human health connections, this concern becomes a water quality and wildlife issue, which can best be addressed under the Clean Water Act. If the NPL listing could require the same goals as a watershed management approach, it would only be after lengthy, wasteful litigation. In addition, the Philadelphia Water Department is already acting as the "enthusiastic catalyst in moving the entire region towards a 'watershed context.'" The City of Philadelphia noted that the chief advantage of NPL listing is that the Superfund provides the initial funding source if PRPs do not agree to fund needed actions on their own.

The City of Philadelphia discussed the Philadelphia Water Department sponsorship of the Darby-Cobbs Watershed Partnership. This partnership is a "consortium of proactive environmental groups, community groups, government and municipal agencies, residents and other watershed stakeholders whose mission is to 'improve the environmental health and safe enjoyment of the Darby-Cobbs Watershed by sharing resources through cooperation of the residents and other stakeholders in the Watershed.'" It contended that this was the intent of EPA in its proposal to list the LDCA. It also discussed the superiority of watershed management as compared to NPL listing. The City of Philadelphia commented that the listing would threaten the Darby-Cobbs Watershed Partnership.

The City of Philadelphia commented that the watershed management approach does not exclude other options for individual problematic areas. It stated, for example, the available data appear to indicate that the former Folcroft Landfill and Annex are the most contaminated areas; and it would be appropriate to target those areas for special attention as a separate location, preferably through agreement between EPA and the United States Fish and Wildlife Service which purchased the property knowing of its previous use and contamination.

The PADEP stated that the best approach for the LDCA would be to await the proposed ATSDR review of residential community concerns and await the completion of a Clean Water Act Section 303 review of the broader watershed. PADEP noted that they have received from Delaware County a Notice of Intent to Remediate Source 6 under *The [Pennsylvania] Land Recycling and Environmental Remediation Standards Act*, a brownfields program. It argued that a remedy consistent with the requirements of this Act can be effective in eliminating off-site impacts at this site, and it wanted EPA to consider the efforts undertaken by Delaware County as EPA develops their overall remedy for the entire site.

In response, while all commenters and EPA agree that this watershed is contaminated, at this time EPA has decided to list the Clearview Landfill and the Folcroft Landfill and Annex sites on the NPL. This action is in accordance with CERCLA Section 105(a)(8)(A), which authorizes EPA to list "releases or threatened releases" of hazardous substances.

The Agency will consider, in future analysis, if a watershed approach, or any other approach is the most appropriate action for the LDCA, how to harmonize actions under CERCLA and the Clean Water Act, and coordination with any ATSDR review. The listing promulgated today does not preclude use of other authorities or approaches to addressing contamination in Lower Darby Creek, including an approach under section 303 of the Clean Water Act. Furthermore, nothing in CERCLA or the Clean Water Act precludes use of both authorities to address contamination affecting a watershed. Moreover, the

appropriateness of any particular CERCLA-funded remedial actions is not at issue in this listing. Such determinations are not made until completion of an RI/FS. Specifically, the evaluation of the RI/FS phase involves on-site testing to assess the nature and extent of the public health and environmental risks associated with the site and to determine what actions, if any, may be appropriate. After the RI/FS is completed, EPA recommends a preferred cleanup alternative, and makes available to all interested parties a proposed plan that outlines the cleanup alternatives studied and explains the process for selecting the preferred alternative. At this time, EPA also provides a public comment period during which citizens are encouraged to submit comments regarding all alternatives. Once the public comment period ends, EPA develops a Responsiveness Summary, which contains EPA responses to public comments. The Responsiveness Summary becomes part of the Record of Decision, which provides official documentation of the remedy chosen for the site.

Regarding Delaware County and Sunoco's comment that EPA's proposal to impose the obligation to study and remediate contamination on their properties would be a taking of private property for a public purpose without just compensation, this listing does not involve a proposal to impose any such obligation. Therefore, the comment addresses matters beyond the scope of this rulemaking. Furthermore, as explained above, the sources located on Delaware County's and Sunoco's property have been removed from consideration in scoring the LDCA listing and have no bearing on EPA's decision to list the Clearview Landfill and Folcroft Landfill and Annex sites.

Remediation of Folcroft Landfill and Annex Using Other Authority

Sunoco and Delaware County stated that EPA and the U.S. Fish and Wildlife Service (FWS) have not performed any remedial work on Folcroft Landfill and Annex, within the John Heinz NWR at Tinicum, which has been owned by the United States for the past twenty years. They further stated that "in the original legislation and later amendments, Congress authorized and directed the U.S. Department of Interior (DOI) to acquire, preserve and restore the Tinicum Marsh," and Public Law 96-315, which provided funds to purchase the Folcroft Landfill and Annex and add it to the Tinicum National Environmental Center, directed EPA and FWS to investigate potential environmental hazards at the facility.

In response, the LDCA listing is consistent with these statues. For example, listing is part of the process for investigating potential environmental hazards. EPA has decided to evaluate the Folcroft Landfill and Annex as a separate site apart from the six other sources originally proposed as part of the LDCA. The appropriateness of any particular remedial actions is not at issue in this listing. As explained above, such determinations are not made until completion of an RI/FS.

State Deferral

The City of Philadelphia indicated that the "DEP is currently prosecuting an action against the owner of the Clearview Landfill. EPA should permit and encourage the DEP to pursue state remedies at this site and elsewhere in order to achieve final closure and any necessary cleanup."

In response, if the City of Philadelphia is requesting that the Agency defer the Clearview Landfill to the State instead of placing it on the NPL, the Agency has decided against this action. On May 3, 1995, EPA issued its "Guidance on Deferral of NPL Listing Determinations While States Oversee Response Actions." EPA developed the guidance in an effort to enhance the State role in addressing sites. The deferral program is an administrative tool to enable States and Tribes, under their own laws, to respond at sites that EPA would otherwise not soon address. EPA implements the guidance in a flexible manner and Regions may act at variance from the guidance. Under the deferral policy generally, the Agency will not defer a site to the State unless, among other things, the State expresses an interest in having the site deferred to it, and viable and cooperative PRPs agree to pay for and conduct response actions.
In the case of LDCA site, EPA has decided that deferral to the State of Pennsylvania is not appropriate because viable and cooperative PRPs have not agreed to pay for and conduct response actions, and the NCP does not permit Fund-financed response actions at non-NPL sites. Furthermore, the State has not requested that the site be deferred. In fact, Pennsylvania Department of Environmental Protection has recommended that EPA pursue the NPL listing of the LDCA (see NPL-U32-5-5-R3 for the recommendation letter). Regarding the City of Philadelphia's indication that the DEP is currently pursuing legal action against the owner of the Clearview Landfill, EPA will not interfere with any actions DEP is pursuing against the owner of Clearview Landfill.

If the City is suggesting that the remediation be handled by the State, even if listed, this is not a listing issue. As explained above, the decision on the most appropriate remediation of a site is made in a different stage of the Superfund process.

3.1.3.4 Superfund Process Concerns

The commenters indicated that the proposed NPL listing would not address the concerns or the risk to human health of the residents living in the LDCA.

The City of Philadelphia contended that the proposed NPL listing does not address the primary concerns of the residents of the Eastwick neighborhood. Philadelphia's Eastwick neighborhood borders the Clearview Landfill and Darby Creek and suffered extensive flooding during Hurricane Floyd in September 1999. The community leaders suspect that residents suffer an unusual incidence of cancers and other illnesses of reproductive organs. Many residents believe that the Clearview Landfill has caused their illnesses. Some of the residents are requesting that the government buy their homes; others are requesting flood controls along Darby and Cobbs Creeks.

The City of Philadelphia stated that EPA and the City of Philadelphia are cooperating with a study recently commenced in Eastwick by the Federal Agency for Toxic Substances and Disease Registry (ATSDR). However, this study is focused solely on whether there is a pathway by which residents could be exposed to toxic substances, not on whether "they have in fact been exposed, or indeed whether the incidence of disease in Eastwick is unusually high." It indicated that "EPA has stated that it does not expect ATSDR to discover a disease pathway, and that the results of the study will in no way affect whether it adds the Lower Darby Creek Area site to the NPL." The commenter stated that, as currently indicated, the ATSDR study will be insufficient. The City of Philadelphia believes that EPA should

support a more comprehensive study, and that the study should precede and affect EPA's decision whether to add the site to the NPL.

In addition, the City of Philadelphia indicated that "Superfund listing generally means delay, all the more so in complex sites like this one that may end up many miles in length." The commenter suggested that if there is a serious threat to human health, then the public interest requires emergency response, i.e., a CERCLA removal action, not many years of study. The commenter said that the delay caused by an NPL listing may cause harm due to the stigma of Superfund; years of uncertainty may lead some residents to leave their homes vacant, injuring the neighborhood and local businesses and tax revenues. The City of Philadelphia stated that CERCLA is ultimately good at digging up, burying, and immobilizing hazardous substances. When concerns extend beyond pollution, however, NPL listing is less effective, and typically causes delay. Furthermore, it does not believe NPL listing is the proper course of action at this time.

The residents of the Eastwick neighborhood of Philadelphia who have purchased homes along the Lower Darby Creek Area (specifically Clearview Landfill) submitted the following questions/comments (in the form of petitions with a total of 61 signatories) regarding the proposed NPL listing:

- why did the Philadelphia redevelopment authority cover and seed a portion of the landfill without a closure plan that was approved by the PADEP;
- who is responsible for building their homes in that area;
- why were the homes allowed to be built without an environmental assessment or engineering survey;
- why were there no deed restrictions or institutional controls in place in the area of the landfill;
- was the home builder made aware of the aerial photographs that were taken in 1973, that revealed pools and pits of standing liquid;
- if a 9/30/1973 closure order was issued to the owner of the landfill, who allowed him to continue his operation and who was responsible for enforcing the order;
- why would PADEP grant ROMA Associates, Incorporated (a batch asphalt plant south of the Clearview Landfill) a permit to operate in this area when there was such a blatant disregard for the Notice of Violations (NOVs) and closure order issued to the Clearview landfill;
- why was Graves Resource Management (GRM), which operated a hazardous waste treatment, storage, and disposal facility at the Clearview Landfill, allowed to operate while there were outstanding issues at the Clearview property;
- why was the owner of the GRM facility sentenced to a prison term but not the owner of Clearview; and

- why was the landfill still allowed to operate after the 1984 court proceedings in which former employees testified that disposal of hazardous waste occurred with disregard to environmental laws?

The citizens requested that EPA respond to the 10 questions as soon as possible, to the names and address listed in the petition.

In response, these comments have no bearing on the site score or EPA's decision to list the LDCA site. The questions posed by the residents of the Eastwick neighborhood of Philadelphia can be more appropriately addressed by PADEP and/or the City of Philadelphia. These comments have been formally referred to the appropriate authorities.

Regarding economic effects and delay, the commenters have given no evidence, and EPA is unaware of any, to support their speculation that the listing would have various adverse social and economic effects. EPA does not think it appropriate to delay addressing the health and environmental issues presented by the site based on mere speculation. The NPL serves primarily as an informational list. Inclusion of a site or facility on the list reflects EPA's judgment that a significant release or threat of release has occurred, and that the site is a priority for further investigation under CERCLA. Furthermore, the focus of the CERCLA program is to identify and, where necessary, address hazardous substances releases that may pose a threat to health or the environment.

Regarding the request of some residents that the EPA perform a removal action if there is a serious threat to human health, or perform a more comprehensive study of health impacts of the Eastwick neighborhood, these comments are beyond the scope of this rulemaking. Listing does not preclude an emergency removal action and does not determine what studies are appropriate to carry out to determine health impacts caused by contamination. Decisions concerning such matters are made outside of the listing process.

3.1.3.5 Communications with the FWS/DOI

In questioning the lack of inclusion of the Norwood Landfill and the CEEC in the site, Sunoco, Delaware County, and DCJA commented that EPA declined to identify the former Norwood Landfill as a source as an accommodation to the FWS, which has plans to purchase this property and incorporate it as part of the John Heinz NWR. Sunoco, Delaware County and DCJA raised issue with the fact that DOI requested that EPA advise it if the Agency planned to include the former Norwood Landfill. They noted a DOI letter to EPA dated December 17, 1999, indicating that the FWS would not acquire this property if EPA intended to include it as part of the LDCA site, and that in response, the EPA advised that the landfill site had not been identified as part of the LDCA because of its distance from the other waste sources. (Sunoco, Delaware County and DCJA pointed out that Norwood Landfill and Clearview Landfill were approximately the same distance from Folcroft Landfill and Annex.) They argued that failure to include these locations as possible sources or exclude the Sunoco, Delaware County, and DCJA properties, demonstrates extreme bias and discriminatory action.

In response, EPA has decided not to include the Norwood Landfill (and the CEEC) as part of the LDCA site at this time. At the time of proposal the Norwood Landfill was a considerable distance from the LDCA. (All of the other sources were in an approximate linear arrangement and each source was in relatively close proximity to the nearest upstream and downstream source included in the site as proposed.) In a letter to FWS dated July 20, 1999, EPA stated that "EPA Region III's comments are not intended to offer a position regarding whether cleanup actions will be necessary in the future to address potential risks to human health and the environment or whether FWS should purchase the Norwood [Landfill]." EPA's decision was based on available information and not as a favor to DOI/FWS. At that time and presently, EPA lacks sufficient information to include Norwood Landfill and CEEC as part of the LDCA listing. Furthermore, EPA has decided at this time to withdraw its evaluation of Sources 2, 3, 4, 5, and 6 from LDCA. The Clearview Landfill and Folcroft Landfill and Annex are being listed as separate sites. At this time, EPA lacks information to list the Norwood Landfill and CEEC as separate sites or to combine them with either the Clearview Landfill or the Folcroft Landfill and Annex.

3.1.3.6 List as a Federal Facility

Sunoco, Delaware County, and DCJA also commented that instead of looking to the U.S. Fish and Wildlife Service (FWS) to "clean its own house," EPA has decided to target private companies and municipal entities for funding a study and cleanup of the John Heinz NWR, an area which the FWS has deliberately expanded through the acquisition of properties known to be contaminated. They stated that it would appear to them that EPA is attempting to list this site as a private site, with DOI/FWS as an innocent landowner, as opposed to a Federal Facility.

In response, the identification of a site as a Federal or non-Federal facility for listing purposes has no legal significance and is purely informational in nature. There are separate tables in the NPL for general sites and federal facility sites. However, neither CERCLA nor the NCP requires that federal facilities be identified separately on the NPL. Further, such designation does not determine or limit the extent of any Federal agency's obligation under Section 120 of CERCLA. (See 58 FR 27507 and 27511, May 10, 1993)

EPA is not including the LDCA listing in the federal facilities section of the NPL because the listing consists of two independently scored sites, one which is a federal facility and one which is not. However, the Folcroft Landfill and Annex will be handled in accordance with section 120 of CERCLA, which deals with Superfund activities at Federal Facilities. CERCLA Section 120 requirements that Federal Facilities follow include completing a remedial investigation and feasibility study for the facility and entering into an inter-agency agreement with EPA for the expeditious completion of all necessary remedial action. (CERCLA section 120(e)(1) & (2).) In addition, all guidelines, rules, regulations and criteria applicable to remedial actions apply to federal facilities in the same manner and to the same extent as they apply to other facilities. (CERCLA Section 120(a)(2).)

Although the John Heinz NWR, owned by the Fish and Wildlife Service (FWS), may have been knowingly extended into contaminated property, as noted by the Delaware County and Sunoco comments, Public Law 96-315 directed EPA and FWS to investigate potential environmental hazards at

the John Heinz NWR; listing Folcroft Landfill and Annex on the NPL is one aspect of EPA's investigation. The Folcroft Landfill and Annex, located in the John Heinz NWR, will be addressed by the appropriate jurisdiction. Under CERCLA Section 120, each Federal agency is responsible for carrying out most response actions at facilities it owns or operates although EPA is responsible for preparing an HRS score and determining whether the facility is placed on the NPL.

The commenters' statements as to who was liable for the contamination at and released from this site are not relevant to this rule making. Liability is not considered in evaluating a site under the HRS. The NPL serves primarily as an informational tool for use by the Agency in identifying those sites that appear to present a significant risk to public health or the environment. It does not reflect a judgment on the activities of the owner(s) or operator(s) of a site. It does not require those persons to undertake any action, nor does it assign any liability to any person. This position, stated in the legislative history of CERCLA, has been explained more fully in the Federal Register (48 FR 40759, September 8, 1983 and 53 FR 23988, June 24, 1988). See Kent County v. EPA, 963 F.2d 391 (D.C. Cir. 1992).

3.1.3.7 Cost to Public/Funding

The City of Philadelphia stated that the NPL listing would be inappropriate for the LDCA; Remedial action under the CERCLA/Superfund remediation model would "require a massive infusion of public money that past experience suggests would take more than a decade, harming neighborhoods and businesses in the meanwhile and would still delay or fail to address many of the most important priorities of the area residents."

In response, EPA will consider any adverse impacts of possible response actions and public comments on them at the appropriate stage in the Superfund process, and will take only those response actions necessary to protect against these releases. Philadelphia provided no specific information regarding how EPA's response could have any adverse effects.

The NPL serves primarily as an informational list. Inclusion of a site or facility on the list reflects EPA's judgment that a significant release or threat of release has occurred, and that the site is a priority for further investigation under CERCLA. Furthermore, the focus of the CERCLA program is to identify and, where necessary, address hazardous substances releases that may pose a threat to health or the environment.

3.1.3.8 Waste Characteristics

The City of Philadelphia commented that the data that EPA relies on are open to serious question, at least in part. It indicated that EPA calculates T/P/B factor values by using the assigned values of benzo(a)anthracene, benzo(a)pyrene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, Aroclor-1248, Aroclor-1260, and dioxin. However, "no testing has reliably established the presence of any of those chemicals at actionable levels in the waters or sediments of Darby Creek or Hermesprota Creek." It noted that the vast majority of surface water or sediment contamination occurs in Hermesprota Creek,

thus eliminating most of EPA's seven sources from likely responsibility. The City of Philadelphia contended that the contamination of the water and sediment samples from Darby Creek is questionable; therefore, how can EPA score the 'site' attributing maximum T/P/B levels to all sources. It stated that the extent of contamination varies widely among sources, suggesting a targeted focus may be more productive than designating an enormous area for Superfund remediation. Furthermore, the City of Philadelphia requested that EPA recalculate the HRS score, considering the different characteristics of the various portions of the proposed site individually.

In response, EPA correctly calculated the T/P/B factor values for the LDCA. As noted previously EPA has removed Sources 2-6 and all hazardous substances associated solely with them from the LDCA HRS evaluation. The Agency followed the procedures as defined by the HRS Sections 4.1.3.2, 4.1.3.2.1, and 4.1.2.2. HRS Section 4.1.3.2.1, *Toxicity/persistence/bioaccumulation,* instructs the user to "[e]valuate all those hazardous substances eligible to be evaluated for toxicity/persistence in the drinking water threat for the watershed (see section 4.1.2.2)." Section 4.1.2.2, *Drinking water threat-waste characteristics,* instructs the user to:

> [e]valuate only those hazardous substances that are available to migrate from the sources at the site to surface water in the watershed via the overland/flood hazardous substance migration path for the watershed (see section 4.1.1.1). Such hazardous substances include:
>
> - Hazardous substances that meet the criteria for an observed release to surface water in the watershed.
>
> - All hazardous substances associated with a source that has a surface water containment factor value greater than 0 for the watershed (see sections 2.2.2, 2.2.3, 4.1.2.2.1, and 4.1.2.1.2.2.1).

Section 4.1.3.2.1.4 of the HRS, *Calculation of toxicity/persistence/bioaccumulation factor value,* states to: "[u]se the hazardous substance with the highest toxicity/persistence/bioaccumulation factor value for the watershed to assign the value to this factor."

The HRS does not require that the hazardous substances used to evaluate T/P/B have to meet or exceed any regulatory limits, nor that the hazardous substances be detected in the media of concern. The HRS requires only that the hazardous substances be detected in sources with containment greater than zero for the pathway (see HRS Sections 4.1.3.2.1 and 4.1.2.2).

The Clearview Landfill has been assigned a surface water containment value of greater than 0 for the watershed (page 23 of the HRS documentation record as proposed and page 25 of the revised HRS documentation record). Benzo(a)anthracene, indeno(1,2,3-cd)pyrene, Aroclor-1248, Aroclor-1254, and Aroclor-1260 are detected in Clearview Landfill and have the highest scoring T/P/B factor values. All of these hazardous substances are eligible because they satisfy the second option identified above, in that they are associated with a source that has a surface water containment factor value greater than 0 for the watershed. See pages 23, 25, 70, 71, and 72 of the HRS documentation record at proposal for a

description of the hazardous substances and containment of the Source and pages 25-28 of the revised Clearview Landfill HRS documentation record.

The waste characteristics assigned value for the Clearview Landfill is 320 for the human food chain threat. See section 3.1.3.2 of this support document, *Site Definition,* for a detailed explanation of the waste characteristics factor value.

The environmental threat was not evaluated as part of the Clearview Landfill site.

The Folcroft Landfill and Annex at LDCA has been assigned a surface water containment value of greater than 0 for the watershed (page 70 of the HRS documentation record as proposed and page 62 of the revised HRS documentation record). Benzo(a)anthracene, and indeno(1,2,3-cd)pyrene are detected in Folcroft Landfill and Annex and have the highest scoring T/P/B factor values. All of these hazardous substances are eligible because they satisfy the second option identified above, in that they are associated with a source that has a surface water containment factor value greater than 0 for the watershed. See pages 23, 25, 70, 71, and 72 of the HRS documentation record at proposal and pages 63, 64, and 70 of the revised HRS documentation record for a description of the hazardous substances and containment of the Sources.

The waste characteristics assigned value for the Folcroft Landfill and Annex is 320 for the human food chain threat. See section 3.1.3.2 of this support document, *Site Definition,* for a detailed explanation of the waste characteristics factor value.

When calculating the waste characteristics for the environmental threat score for the Folcroft Landfill and Annex , HRS Sections 4.1.4.2, 4.1.4.2.1, 4.1.4.2.1.1, and 4.1.4.2.3 were considered. HRS Section 4.1.4.2.1, *Ecosystem toxicity/mobility/persistence/bioaccumulation,* instructs the user to "[e]valuate all those hazardous substances eligible to be evaluated for toxicity/mobility/persistence in the drinking water threat for the watershed." HRS Section 4.1.4.2.1.1, *Ecosystem toxicity*, says to "[a]ssign an ecosystem factor value to each hazardous substance as specified in 4.1.4.2.1.1. HRS Section 4.1.4.2.1.1 directs the scorer to consider all the hazardous substances present in the observed releases and/or the sources at the site as being available for migration to the watershed. Thus, as similarly calculated for the human food chain threat score, the highest scoring T/P/B factor values pertain to benzo(a)anthracene, and benzo(a)pyrene, which are detected in Folcroft Landfill and Annex. These substances satisfy the second bullet, in that they are associated with a source that has a surface water containment factor value greater than 0 for the watershed.

The waste characteristics assigned value is 320 for the environmental threat for the Folcroft Landfill and Annex. See section 3.1.3.2 of this support document, *Site Definition,* for a detailed explanation of the waste characteristics factor value.

EPA notes that dioxin was detected in Source 6 and dibenzo(a,h)anthracene was detected in Sources 2 and 5. As discussed previously, these sources have been removed from consideration in the LDCA listing. Therefore, these hazardous substances are no longer used in the scoring of either site.

Regarding the fact that regulatory limits of certain hazardous substances were not exceeded in some of the samples collected, EPA appropriately identified the presence of hazardous substances in all of the sources. Section 2.2.2 of the HRS, *[i]dentify hazardous substances associated with a source,* states the following*:*

> For each of the three migration pathways, consider those hazardous substances documented in a source (for example, by sampling, labels, manifests, oral or written statements) to be associated with that source when evaluating each pathway.

This is the procedure the Agency followed in identifying substances associated with the LDCA listing. The HRS does not require that a substance be detected at a particular concentration before it can be associated with a source. While concentrations of individual hazardous substances are not taken into consideration when associating hazardous substances with a source in HRS scoring, they are taken into consideration when assigning level of contamination to targets.

Regarding the comment that the contamination of the water and sediment samples from Darby Creek is questionable, as described in Section 3.1.3.2, Site Definition, the observed release by chemical analysis is no longer being used to score the Clearview Landfill or the Folcroft Landfill and Annex sites; therefore, the adequacy of the samples is no longer relevant to the scoring of the LDCA listing. Furthermore, the waste characteristic T/P/B values assigned are based on hazardous substances in both the Clearview Landfill and the Folcroft Landfill and Annex and in the observed releases by direct observation for these two landfills rather than on water or sediment samples from Darby Creek.

These comments have no effect on the current scoring of the LDCA listing.

3.1.3.9 Surface Water Targets/Risk

The City of Philadelphia stated that the “targets/receptor component of the Hazard Ranking System (HRS) model has not been well defined.” It commented that, presently, no data support the contention that contaminants have impacted people, fish or wildlife. The City of Philadelphia stated that the scoring of the human food chain for targets and individuals is misleading. It indicated that Darby Creek is obviously not a healthy creek and has been designated “impaired” through its entire length, and most people recognize that they should not eat fish caught there. The City of Philadelphia commented that eating fish would be the only link to the human food chain; while this threat may warrant more systematic posting, it does not warrant NPL listing unless there is some other link than fish from the creek.

Delaware County and Sunoco noted that in a survey of benthic macroinvertebrates and fish in the Tinicum Marsh performed by Gannett Fleming (1989), no significant relationship was shown between benthic community structure and contaminant concentrations in the sediment, and the fish community was found to be typical of other tidal freshwater habitats in the Delaware River basin. They stated further that the Gannett Fleming study found no significant relationships between biological community structure within Tinicum Marsh and contaminant levels or potential contaminant source locations. They stated that in conclusion, "[i]t is likely that the aquatic communities in Tinicum Marsh, particularly the fish community, are more diverse today than evidenced in the 1989 Gannett Fleming study due to improvement in dissolved oxygen concentrations. . . ."

Delaware County and Sunoco questioned the rationale for EPA's proposed action, the alleged impact on the ecosystem of the LDCA. They stated that numerous studies of the LDCA have shown that it supports a broad and diverse ecosystem that is equal to or better than "reference locations studied in the Region." They further stated that despite historic environmental stresses, the Tinicum Marsh and associated tidal creeks support a diverse assemblage of plants and animals.

In response, the evaluation of the surface water targets was correctly performed and remains correct for the modified listing. The HRS is a tool for relative risk ranking, not a comprehensive risk assessment. A more detailed study of the risk posed by sites is conducted at a later stage in the Superfund remediation process.

EPA correctly evaluated the human food chain threat at LDCA. As stated by Waterways Conservation Officer Burrell of the Pennsylvania Fish Commission in a telephone conversation (Reference 80 of the HRS documentation record at proposal), Darby Creek is used by local bass fishermen from the John Heinz National Wildlife Refuge to the Delaware River. Darby Creek is stocked with trout 6 to 8 times in the spring. The interview goes on to state that the creek is also fished for catfish, muskies, large mouth bass, small mouth bass, and striped bass. There is a fishing pier at the refuge, which is a very popular fishing spot.

As stated in the preamble to the final rule for the revised HRS (55 FR 51532 December 14, 1990), "SARA requires that EPA consider 'the damage to natural resources which may affect the human food chain * * *' Accordingly, the surface water migration pathway of the proposed rule included evaluation of threats to human health via the aquatic food chain." The human food chain threat score is based on three factor categories; likelihood of release, waste characteristics, and targets (Section 4.1.3 of the HRS, *human food chan threat*). The equation for the human food chain threat score is likelihood of release multiplied by the waste characteristics factor value and the targets value; the product is then divided by 82,500. The surface water pathway score is the sum of the drinking water threat score, the human food chain threat score and the environmental threat score, subject to a maximum of 100 (Section 4.1.5 of the HRS, *Calculation of overland/flood migration component score for a watershed*). The site score is then calculated by adding the squares of the four pathway scores (ground water, surface water, soil exposure, and air) dividing the sum of the squares by four and taking the square root. See pages 37-43 of the revised Clearview Landfill HRS documentation record and pages 74-80 of the revised Folcroft Landfill and Annex HRS documentation record for the scoring of the human food chain threat.

Regarding the comment that Darby Creek has been designated "impaired and most people recognize that they should not eat fish caught there, human food chain organisms are present in Darby Creek , and some attempt has been made to catch those human food chain organisms. The HRS does not require that a detrimental effect on the human food chain organisms or correlation between the aquatic community and the contaminants in the watershed be established. Section 4.1.3.3 of the HRS, *Human food chain threat-targets,* instructs the user to:

> [c]onsider a fishery (or portion of a fishery) within the target distance limit of the watershed to be subject to actual human food chain contamination if any of the following apply:
>
> - A hazardous substance having a bioaccumulation potential factor value of 500 or greater is present either in an observed release by direct observation to the watershed or in a surface water or sediment sample from the watershed at a level that meets the criteria for an observed release to the watershed from the site, and at least a portion of the fishery is within the boundaries of the observed release (that is, it is located either at the point of direct observation or at or between the probable point of entry and the most distant sampling point establishing the observed release.
>
> - The fishery is closed, and a hazardous substance for which the fishery has been closed has been documented in an observed release to the watershed from the site, and at least a portion of the fishery is within the boundaries of the observed release.

The fishery has not been officially closed by the State for a contaminant that was attributable to the site. Even if the fishery was closed for a contaminant that was attributable to the site, as stated above, the fishery would still be subject to actual contamination as evaluated by the HRS.

Since the fishery has not been officially closed due to a hazardous substance documented in an observed release to the watershed from the site, and cadmium, copper, and zinc have bioccumulation potential factor values of greater than 500 and were documented in the observed release by direct observation from the Clearview Landfill into Darby Creek (see pages SW-87 and SW-115 of the HRS documentation record at proposal and pages 41-42 of the revised HRS documentation record). This portion of the fishery is subject to actual contamination. Darby Creek is classified as a fishery for the entire target distance limit (Reference 80 of the HRS documentation record). An observed release by direct observation has been documented for the Clearview Landfill. Hazardous substances are entering the Lower Darby Creek from the Clearview Landfill. The hazardous substances documented in the observed release and the Clearview Landfill could have an adverse effect on the targets present within the Clearview Landfill target distance limit (TDL). The Clearview Landfill represents a risk to humans through the consumption of fish, which are present and caught within the TDL (pages SW-119-SW-121 of the HRS documentation record at proposal and pages 41-43 of the revised HRS documentation record).

The same analysis also applies to the Folcroft Landfill and Annex. Copper chromium, iron, nickel, zinc, lead, arsenic, barium, and cadmium were detected in various samples collected from leachate seeps observed entering Darby Creek and John Heinz NWR from the Folcroft Landfill and Annex. Hazardous substances are entering the Lower Darby Creek from the Folcroft Landfill and Annex. The hazardous substances documented in the observed release and the Folcroft Landfill and Annex could have an adverse effect on the targets present within the Folcroft Landfill and Annex TDL. (See pages 70, SW-87, SW-88, SW-89, SW-115, and SW-119-SW121 of the HRS documentation record at proposal and pages 62, and 78-80 of the revised HRS documentation record).

Regarding the environmental targets, EPA correctly evaluated the sensitive environments at LDCA. There are targets present (John Heinz NWR at Tinicum, habitat known to be used by two Federal designated or proposed endangered or threatened species, a red-bellied turtle and southern leopard frog; and habitat known to be used by three State designated or proposed endangered or threaten species; American bittern, least bittern, and great egret, see page SW-135 of the proposed HRS documentation record, page 90 of the revised HRS documentation record, and HRS Table 4-23, *Sensitive Environments Rating Values*) and releases have been documented to Darby Creek; therefore, this site does pose a threat to human health and the environment. Section 4.1.4.3.1.1 of the HRS states: "[a]ssign value(s) from Table 4-23 to each sensitive environment" subject to contamination. The HRS does not require that an adverse impact on the ecosystem be documented. Tinicum Marsh and associated tidal creeks are subject to contamination from the site.

Folcroft Landfill and Annex (environmental targets are not evaluated for the Clearview Landfill) is located on the John Heinz NWR (the largest freshwater tidal marsh in Pennsylvania), which was established by Congress to preserve diverse fish and wildlife habitat for natural and educational purposes (page SW-134 of the HRS documentation record at proposal and page 88 of the revised HRS documentation record). The diverse habitat of the John Heinz NWR provides food, cover, and nesting requirements for a variety of wildlife that are endangered or threatened (see page SW-135 of the HRS documentation record at proposal and pages 88 and 90 of the revised HRS documentation record).

The listing stage of the Superfund process is intended only as a screening assessment. Listing indicates that sufficient information is available to demonstrate that the site warrants further investigation. A risk analysis, including both the risk to humans and to the environment, is performed in a later stage of the Superfund process, generally following the RI, and the result of this analysis is used in determining the need, if any, and the extent of the remediation at the site.

3.1.3.10 Previous Site Scores

The City of Philadelphia commented that "[i]f the site is listed, PRPs in ensuing litigation will question how EPA can give the site the maximum HRS score for the surface water migration pathway, when EPA previously scored the Clearview and Folcroft [Sources 1 and 7] below 28.5 on the HRS." The City of Philadelphia stated that EPA was unable to individually achieve an HRS score of 28.5 for any of the

seven sources included in the proposed LDCA site. The City of Philadelphia indicated that, at a minimum, EPA should score each site individually and then explain why the entire area should be designated a single site.

In response, EPA has demonstrated that the Clearview Landfill and Folcroft Landfill and Annex qualify for listing individually and has grouped them in a single listing. (EPA has excluded Sources 2, 3, 4, 5, and 6 from the LDCA site evaluation.) Clearview Landfill and Folcroft Landfill and Annex both score above 28.50 based on information included in the HRS documentation record as proposed (see section 3.1.3.2 *Site Definition* of this document, and the revised HRS documentation records for a detailed explanation of the site scores). Several previous scoring events have taken place at various areas along Lower Darby Creek. Some of these events involved scoring with the original (1982) HRS. (The revised HRS was not promulgated until December 14, 1990.) The original HRS did not evaluate the human food chain threat of the surface water pathway; therefore, not all of the same targets would have been evaluated in these scoring events as in the current scoring event. All of the past scoring events were preliminary events, none of them were proposed to the NPL, and none of them had gone through EPA Headquarters stringent review processes. The commenter does not indicate the specific scoring event where the Clearview Landfill site and the Folcroft Landfill and Annex site failed to score above 28.50. Regardless of the previous scores, as shown in the HRS documentation record for Clearview Landfill site and Folcroft Landfill and Annex site, these two sites score above 28.50 independently.

3.1.4 Conclusion

The original HRS score for this site was 50.00. Based on the above response to comments, and the Agency's decision to list the LDCA as a single listing of two sites consisting of the Clearview Landfill and the Folcroft Landfill and Annex, the final scores for the Lower Darby Creek Area listing are:

Clearview Landfill Site Score

Ground Water:	Not Scored
Surface Water:	96.06
Soil Exposure:	Not Scored
Air:	Not Scored
HRS Score:	48.03

Folcroft Landfill and Annex Site Score

Ground Water:	Not Scored
Surface Water:	100.00
Soil Exposure:	Not Scored
Air:	Not Scored
HRS Score:	50.00

REGION 6

4.1 MALONE SERVICE COMPANY, INC., TEXAS CITY, TEXAS

4.1.1 List of Commenters and Correspondents

NPL-APMS-3-2-1-R6	Comment received October 24, 2000 from W.J. "Billy" Powell, President of Twist, Inc.
NPL-APMS-3-2-2-R6	Comment dated October 23, 2000 from John R. Moore, Attorney for Southeast Texas, Environmental, L.L.C. (STE)
NPL-APMS-5-2-R6	Correspondence dated July 20, 2000 from Governor W. Bush, State of Texas

4.1.2 Site Description

The Malone Service Company (MSC) site is located in Texas City, Galveston County, Texas, and encompasses the property formerly used by the Malone Service Company, Inc., as a hazardous waste storage, reclamation, and disposal facility. The facility, which covers approximately 150 acres, operated from 1964 until 1996. The entire facility is surrounded by an 18-foot-high flood protection levee. Wetlands and Galveston Bay border the east side of the facility, adjacent to the levee. The site was proposed to the NPL based on evidence that hazardous substances from the facility, including chlorinated solvents, phenols, polycyclic aromatic hydrocarbons (PAHs), and metals (specifically chromium and lead) have contaminated the underlying ground water and have migrated to Galveston Bay, a National Estuary and major fishery, and associated wetlands.

Wastes were received by the facility from a variety of industries and included acids and caustics from industrial cleaning and surface preparations; contaminated residues and solvents removed from processing and storage units during cleaning operations; spent drilling fluids, including drilling muds and brines, from well workover and exploration activities; acids containing metals from etching and plating operations; inorganic slurries from sump cleaning; gasoline and crude oil tank bottoms; contaminated earth and water from chemical spill cleanup operations; general industrial plant wastes; phenolic tars; and waste oils.

The MSC facility used an earthen impoundment and an in-ground, concrete, American Petroleum Institute (API) separator for the equalization of the various waste streams and separation of wastes into aqueous, non-aqueous organic, and solid phases. The earthen impoundment, which covers approximately 5 acres, is filled with oily solids and contaminated water to a depth of up to 40 feet. The API unit, with a capacity of 1,308,000 gallons, also contains residual waste.

Beneath the site is a shallow ground water aquifer consisting of a buried sand channel that was formed as part of the delta of an ancient river. The aquifer crosses beneath the site and extends to Galveston Bay. Both the earthen impoundment and the API separator were constructed within the channel aquifer. The earthen impoundment is partially unlined where it comes into contact with the aquifer. The API separator is a concrete structure; the integrity of the structure has not been assessed.

The Texas Natural Resource Conservation Commission (TNRCC) collected samples of material in the impoundment and API separator as part of compliance inspections in 1986 and 1989. TNRCC returned to the site in 1997 to evaluate potential ground water and sediment impacts associated with the site. Ground water samples collected during the 1997 inspection indicated that hazardous substances originally found in the impoundment and API separator in the 1980s, including phenol, chlorinated compounds (chlorobenzene, 1,1-dichloroethane, 1,2-dichloroethane, 1,1-dichloroethylene, 1,2-dichloroethylene, 1,1,2-trichloroethane, and vinyl chloride), and metals (arsenic, barium, chromium, copper, and lead) had been released to the underlying aquifer. Chemical analysis of sediment samples collected from Galveston Bay during the 1997 inspection documents that chromium and lead have already migrated to the Bay.

Galveston Bay is the seventh largest estuary in the United States and is part of the National Estuary Program. This 600 square mile estuary and its adjacent wetlands support a wide range of commercial and recreational fishing. More than 70 species of waterfowl and shorebirds and 90 species of amphibians and reptiles inhabit Galveston Bay.

In July 1998, TNRCC and the State of Texas Office of the Attorney General (OAG) filed for involuntary Chapter 7 bankruptcy for Malone Service Company, Inc. Subsequently, the property was auctioned in a Federal Bankruptcy court and was awarded to Eagle Environmental Technologies. Eagle Environmental Technologies was unable to prove financial assurance and the facility was auctioned, again, with the condition that financial assurance be presented at the time of the auction. In this second auction, Southeast Texas Environmental, L.L.C. (STE), who had been acting as caretaker of the facility throughout the bankruptcy process, was awarded ownership of the property over TWIST, Inc., another prospective purchaser.

4.1.3 Summary of Comments/Correspondence

Governor George W. Bush of Texas wrote in support of the listing.

Mr. W. J. “Billy” Powell, President of TWIST, Inc., commented in “absolute objection to the Malone Service Company (MSC) Swan Lake Facility being added to the CERCLA National Priority [sic] List for cleanup at taxpayer expense.” Mr. Powell stated that his company is willing to purchase and clean up the MSC facility, but has been obstructed from acquiring the property. In addition, Mr. Powell asserted that the MSC facility does not pose an environmental threat if it is properly managed.

Mr. John R. Moore, Attorney for STE, commented on behalf of STE, the current owners of the MSC property, in opposition to the listing of MSC on the NPL. STE stated that it had performed site maintenance at the facility since 1997 and was willing to continue to conduct maintenance activities. In addition, STE stated that it is willing to perform remedial actions at the facility under an Administrative Order on Consent (AOC) with EPA. STE also claimed that the HRS documentation record at proposal does not establish that lead and chromium contamination in wetlands adjacent to Galveston Bay originated at the MSC facility. According to STE, several potential other sources of the lead and chromium contamination in the wetlands exist in the area.

4.1.3.1 Acquisition of the Facility and Texas Actions Regarding the Facility

Mr. Powell commented that the State of Texas OAG and the TNRCC had "actively obstructed private efforts to cleanup this facility." Mr. Powell stated that "the Malone Service Company Facility 'Problem' is and has been more of a political problem than an environmental danger." Mr. Powell also stated that "[t]here is an environmental cleanup at this facility that has needed to be carried out for over a decade."

According to Mr. Powell, MSC owed the State of Texas $2.4 million, but the State only collected $16,000 from MSC. In August 1998, Mr. Powell offered a settlement to the Texas Attorney General Collections Division in exchange for possession of the MSC facility. According to Mr. Powell, the OAG refused payment of this "offer to settle an otherwise uncollectable judgement." Mr. Powell stated that "we (or ETC)" offered the Texas OAG a $1.2 million "settlement," but this offer was refused in favor of another offer from a friend of an OAG employee. According to Mr. Powell, "the other offer never came through." Mr. Powell described other failed attempts to acquire the MSC property through "private contracts with the Malones" and through three Sheriff sales. Mr. Powell stated that he had asked to be updated on negotiations involving the MSC facility in March of 1998, but was "systematically denied the needed information that [TWIST, Inc.] had every legal right to be afforded." According to Mr. Powell, OAG filed an involuntary Chapter 7 Bankruptcy for MSC in July 1998. Mr. Powell stated that he then attempted to stop this involuntary bankruptcy by paying "in full the tax bill of the Malone Company to the Texas Workforce Commission." According to Mr. Powell, however, the "OAG had the payment stopped ... solely in order to stop my possession of the MSC Swan Lake Facility." Mr. Powell opined that he was excluded by OAG in favor of STE. Mr. Powell stated that, "[p]rior to the Bankruptcy, STE's predecessor group had a contract with Malone Service Company that would have paid the State on their Judgement and other creditors an aggregate of over seven million dollars." Mr. Powell alleged that the "Caretaker / Creditor in Possession scheme is clearly to the detriment of most all of the other creditors and parties of interest," and resulted in STE acquiring the MSC property at a considerably reduced price. Mr. Powell asserted that the Interim Trustee actively represented one of the Malone Service Company's creditors and that Assistant Attorney General Hal Morris "has spearheaded efforts to discredit me with the Court and Trustee." Mr. Powell stated that he purchased a controlling interest in the Malone Service Company and attempted to reorganize the company "through Chapter 11 Conversion / Reorganization, but was stopped in Bankruptcy Court by the OAG."

According to Mr. Powell, OAG and STE "schemed" to give ownership of the facility to STE by ensuring that there were no other prospective purchasers. Furthermore, Mr. Powell stated that "the OAG enabled STE to cause a pseudo-crisis by mismanaging storm water to intentionally keep the Swan Lake facility

[MSC site] teetering on the brink of environmental disaster during the hurricane season." Mr. Powell asserted that "[t]his cognitive environmental negligence worked well to keep the Court and Interim Trustee scared into fast tracking the sale process, which limited the participation of creditors and competing prospective purchasers."

Mr. Powell explained that STE had acquired the MSC facility with a condition of sale that STE would take environmental responsibility of the property. Mr. Powell asserted that the bankruptcy court had required a financial assurance closure bond as part of the bidding process for the MSC facility, but that STE did not post this bond.

Mr. Powell stated that his company had worked for five years and had spent "a great deal of money" in attempting to purchase the facility with the intent of performing a private cleanup and developing the Environmental Technology Commercialization Center. According to Mr. Powell, the "OAG and TNRCC prevented the facility from an orderly cleanup and productive operations" and thereby prevented the construction of an "Environmental Technology Commercialization Center." Mr. Powell asserted that the activities of the proposed Environmental Technology Commercialization Center "would be implemented consistent with the Interstate Regulatory Cooperation Agreement under the supervision of the Southern States Energy Board and Department of Energy." Mr. Powell stated that this approach has the support of "Texas Congressmen from Tom DeLay to Ralph Hall ... because it serves to avoid another Superfund site in Texas." Mr. Powell stated that "the forces that be are trying to create a Superfund site where private interest were [sic] prepared to act voluntary [sic]."

In response, because Mr. Powell's description of the State's actions and Twist, Inc.'s, unsuccessful attempts to acquire the MSC site property did not contain any comments specific to the proposed listing of the MSC site on the NPL, no EPA response is required or appropriate.

4.1.3.2 Private Parties Willing to Perform Cleanup

Mr. Powell objected to the proposed addition of the MSC site to the NPL "for cleanup at taxpayer expense." Mr. Powell stated that "the remaining closure of the 5-acre surface impoundment should be the financial burden of the new property owner Southeast Texas Environmental, L.L.C. (STE) and not the taxpayers." Mr. Powell stated that the MSC site could be cleaned up "under the risk based State Voluntary Cleanup Program," an approach facilitated by Texas' "Billy's Law (amendment to the Health and Safety Code HR 2776, Section 13 & 14)," which Mr. Powell asserts he "conceived and caused to be passed" in 1997.

Mr. Powell included in his comment letter a narrative describing his experience in attempting to acquire the MSC facility with the goal of returning the MSC facility to compliance and constructing an Environmental Technology Commercialization Center using private funds (see section 4.1.3.1 of this support document). Mr. Powell asserted that his efforts toward this goal were obstructed, but that he would still be willing to perform and finance the cleanup of the site if these obstructions were removed.

Mr. Powell proposed that:

> If my company [Twist, Inc.] can secure possession of the Swan Lake Facility [MSC site] we could arrange to stabilize the facility, post financial assurance, begin remediation, transfer the permits, rework the wells, develop a world class Environmental Technology Commercialization Center, install ground water flow prevention walls, develop barge slips, modernize the facility and pay the delinquent property taxes.

Mr. Powell indicated that TWIST, Inc., would be interested in negotiating "a Prospective Purchasers Agreement with the EPA, after STE dies the natural business death that seems to be inevitable and the facility can be acquired through foreclosure."

Mr. Powell commented that "[t]he only positive action that has occurred at the facility in the past ten years has been the Emergency Removal Action brought by the EPA." Mr. Powell described that removal action as "speedy and cost effective" and stated that it resolved the immediate threats to the environment, with exception to the 5-acre surface impoundment.

Mr. Powell stated that "[c]urrently the Malone Service Company Site poses no immanent [sic] threat to the public health." Mr. Powell opined that "with the cost effective cooperation and oversight of the EPA and TNRCC any possible or threatened groundwater contamination migration can be controlled, managed, monitored and attenuated by existing systems at the facility." According to Mr. Powell, if the facility is managed properly, there should be no danger of release from any of the waste management units at the facility, except for the 5-acre surface impoundment.

Mr. Powell commented that "[t]his site has no business on the National Priority [sic] List (NPL) and should score very low on the Hazardous [sic] Ranking System (HRS)." Mr. Powell stated that the "EPA Response and Prevention Branch, Removal Team #2 have addressed the immediate threat for the release of contaminants into the environment at the taxpayer's expense."

STE stated that, before the closing of STE's purchase of the MSC facility, EPA had notified STE, by letter, that EPA had evaluated the site for emergency response and had identified several areas of concern. According to STE, EPA's letter had stated that "it is the EPA's policy to avail potentially responsible parties the opportunity to implement the necessary investigations and action pursuant to an administrative order on consent" and that "the work must be conducted according to a signed administrative order and an EPA-approved workplan with federal oversight."

STE stated that it had repeatedly requested that EPA allow STE "to perform emergency remedial and removal actions at the MSC Site through an administrative order on consent." STE stated that STE made similar requests of TNRCC. According to STE, "EPA representatives stated that STE would be given the opportunity to do that work, but never provided STE with that opportunity and took over emergency remedial action at the site." STE claimed that "at the last communication between attorneys for STE and the EPA, the EPA's attorney, Pam Travis, advised [STE] that the administrative order on consent to

allow STE to perform removal actions was in draft and would soon be sent to STE." According to STE, "[t]he draft administrative order was never sent."

STE stated that "STE remains willing and able to perform necessary removal and remediation activities at the site." STE commented that "it is not necessary to expend federal funds on removal or remediation and therefore it is not necessary to list the MSC Site on the NPL." According to STE:

> Even though the documentation demonstrates that the MSC Site is not the source of the lead and chromium contamination found in wetlands sediments [See Section 4.1.3.3, of this support document], STE has proposed to cut off potential off-site migration of contaminants through the paleozoic channel aquifer by installation of a cutoff wall across the channel. STE is ready, willing and able to install the cutoff wall as an initial step in a comprehensive remedial action plan to address all areas of environmental concern at the MSC Site.

STE stated that it remains "willing to perform removal and remedial work at the MSC Site consistent with the National Contingency Plan pursuant to an administrative order on consent with the EPA," and requested an opportunity to meet with EPA representatives on this matter. STE indicated that it would "welcome an opportunity to advance a privately funded remediation solution for this site."

STE commented that STE has acted as caretaker for the site and has "continuously maintained the site" since May 1997. STE stated that "[s]ite maintenance by STE has included controlling surface water run-on and run-off, preventing off-site migration of contamination, maintaining vital equipment and maintaining a full time around-the-clock staff as required for all hazardous waste sites." STE claimed that this maintenance also included "preparation for and response to all major storm events throughout the nearly 4 year period" during which STE was caretaker. Furthermore, STE claimed that during its time as caretaker, "all surface water was properly handled with no off-site surface water discharges."

STE stated that, in 1997, STE negotiated with MSC and TNRCC to purchase the property and to have permits reissued for hazardous waste injection wells and associated processing facilities. STE stated that:

> In February of 1998, attorneys from the Texas Attorney General's Office representing the TNRCC proposed that, rather than STE directly acquiring the Swan Lake Facility [MSC site] from Malone Service Company, Inc., that the TNRCC would force Malone Service Company into bankruptcy and subsequently have the property sold by the Bankruptcy Trustee to STE. The permits would be reissued to STE and the facilities used to facilitate private financing of remediation of the MSC Site.

According to STE, "TNRCC and other creditors of Malone Service Company, Inc. filed an involuntary petition under Chapter 7 of the United States Bankruptcy Code in the United States Bankruptcy Court in the Southern District of Texas." STE stated that, throughout this process, STE performed maintenance at the facility and prevented off-site migration of contaminants. STE commented that "STE was willing to

perform these expensive activities based on the TNRCC's and the Texas Attorney General's continuing representations that their intention was to have the permits reissued to STE." STE explained that it acquired the facility after another company, Eagle Environmental Technologies, bid highest for the property during the first bankruptcy auction, but was later found to be unable to meet the financial commitments. STE stated that "[s]everal months after the Eagle transaction failed, STE finally purchased the site on September 24, 1999." STE claimed that, during this time:

> STE incurred the expenses of maintaining the Swan Lake Facility, handling surface water and preventing off-site migration of contamination. STE was willing to undertake those expenses based on the TNRCC's continuing representations that it was willing to pursue a course that would allow STE to perform remediation activities at the site financed in part through use of the site facilities pursuant to reissued permits.

According to STE, "STE has spent over 4.5 million on this project" for payroll expenses, equipment costs, site acquisition, and in pursuit of reissued permits and the authority to remediate the site.

In response to Mr. Powell's suggestion that the MSC site should be deferred to a State cleanup program, EPA is guided in this matter by its "*Guidance on Deferral of NPL Listing Determinations While States Oversee Response Actions*," issued on May 3, 1995. EPA developed this guidance in an effort to enhance the State role in addressing sites. The deferral program is an administrative tool to enable States and Tribes, under their own laws, to respond at sites that EPA would otherwise not soon address. Generally, under the deferral policy:

- Deferral may be implemented on either a State-wide, Tribe-wide, or site-specific basis;
- The State or Tribe must express interest in having the site deferred to it and must agree to address the deferred site sooner than, and at least as quickly as, EPA would expect to respond;
- Response actions will be conducted under State or Tribal authority;
- Viable and cooperative PRPs will agree to pay for and conduct response actions--Superfund Trust funds generally will not be made available for conducting response actions;
- Response actions must be protective of human health and the environment and meet State or Tribal and Federal applicable requirements;
- A site may not be deferred if the affected community has significant, valid objections;
- The level of oversight of States and Tribes will be negotiated with the Region; and

- Once a deferral response is complete, EPA will remove the site from CERCLIS and will not consider the site for the NPL unless the Agency receives new information of a release or potential release that poses a significant threat to human health or the environment.

In the case of the MSC site, both TNRCC and the Governor of Texas have requested that EPA propose the MSC site to the NPL. Since the State has not requested that the MSC site be deferred to Texas, application of EPA's state deferral policy is not appropriate at this time.

In response to the commenters' willingness to clean up the MSC site, themselves, NPL listing would in no way prevent a private party from doing so. CERCLA Section 122, Settlements, specifies that:

> The President, in his discretion, may enter into an agreement with any person (including the owner or operator of the facility from which a release or substantial threat of release emanates, or any other potentially responsible person), to perform any response action ... if the President determines that such action will be done properly by such person. Whenever practicable and in the public interest, as determined by the President, the President shall act to facilitate agreements under this section that are in the public interest and consistent with the National Contingency Plan in order to expedite effective remedial actions and minimize litigation.

Therefore, the commenters' willingness to perform future cleanup activities is not relevant to the proposed listing of the MSC site on the NPL. Furthermore, including a site on the NPL does not necessarily cause EPA to undertake or recommend any remedial action or indicate that any action is required by, nor liability for site response costs assigned to, a private party (56 FR 21462, May 9, 1991). Responsible parties may bear some or all the costs of the Remedial Investigation/Feasibility Study (RI/FS), if conducted, and subsequent work, or the costs may be shared by the EPA and the States. Any Agency actions that may impose costs are based on discretionary decisions and are made on a case-by-case basis. These decisions are made after NPL listing.

In response to Mr. Powell's comments about the removal action at the MSC site, EPA agrees that the surface water impoundment may have the continuing potential to release hazardous substances. EPA is not certain, however, that the existing systems at the site are adequate to prevent further migration of hazardous substances into and/or through ground water. The HRS score for the MSC site is based on an evaluation of the ground water to surface water migration component of the surface water migration pathway. This evaluation demonstrates that an observed release of hazardous substances has already occurred, both to the ground water beneath the site and to nearby surface water sediments, via ground water. To more fully evaluate the threats associated with these releases, EPA's current intent is to conduct an RI/FS after the MSC site is listed on the NPL.

In response to Mr. Powell's comments regarding the appropriateness of NPL listing for the MSC site, EPA asserts that the MSC site is an appropriate candidate for inclusion on the NPL based on its HRS score of 50, as documented in the HRS documentation record at proposal.

In response to STE's suggestion that "a cutoff wall across the channel" should be installed and to Mr. Powell's suggestions that remedial action is required at the surface impoundment, these and/or other cleanup remedies for the site will be addressed, if appropriate, after NPL listing, during the remedy selection phase. At that time, the public can comment on any remedy that might be proposed by EPA. EPA believes that this procedure, which is specified in the NCP, will ensure that the selected remedy is protective, feasible and cost-effective, and that the public has had sufficient opportunity to examine and comment on the basis for remedy selection. The issue of remedy selection is not considered during the NPL listing process. Therefore, the comments addressing this issue have no affect on the HRS score for the MSC site or on the proposed listing of the MSC site on the NPL.

In response to STE's comments on their process of acquiring the MSC site and their reasons for maintaining it, these comments are not relevant to the proposed listing of the MSC site on the NPL. Therefore, no EPA response is required or appropriate for these comments.

In response to STE's assertions that their maintenance of the MSC site has been adequate to control stormwater runoff from the site, these comments are irrelevant to the HRS site score. The HRS documentation record at proposal documents that hazardous substances have migrated from the site to nearby wetlands via ground water flow, rather than via stormwater runoff. STE does not assert that their maintenance efforts have or will prevent the continued migration of hazardous substances through ground water.

4.1.3.3 HRS Scoring Based on Flawed Assumption

STE commented that "the hazard ranking was performed based on a fundamentally flawed assumption" that lead and chromium had migrated from the sources at the site, through the Paleozoic channel beneath the site, to the wetlands adjacent to Galveston Bay. STE opined that "[t]his assumption is unjustified and is contradicted by the reference documentation upon which the EPA performed its ranking."

STE stated that Reference 4 of the HRS documentation record at proposal, the SSI Report, describes "an investigation of sediments of wetlands adjacent to Galveston Bay in an area where a paleozoic channel aquifer outcrops into the wetlands." STE reported that the SSI Report found numerous contaminants in the Paleozoic channel aquifer, including: arsenic; barium; chromium; lead; chlorobenzene; 1,1-dichloroethane; 1,2-dichloroethane; 1,1-dichloroethylene (1,1-dichloroethene); 1,2-dichloroethylene (total) (1,1-dichloroethene); phenol; 1,1,2-trichloroethane; and vinyl chloride. According to STE, "[a]mong these contaminants, only lead and chromium were found in the wetlands samples." STE concluded that:

> If the lead and chromium found in the wetlands sediment samples originated in the paleozoic channel aquifer at MSC Site, the other constituents would also be present. Because they were not found, the lead and chromium must have originated from a source other than the MSC Site. The evidence in the HRS Documentation Record demonstrates that the lead and chromium contamination, which form the only basis for a score of 50 in

> the hazard ranking system, did not originate at the MSC Site. The entire score of 50 is therefore unjustified.

STE opined that the "very documentation upon which the claim is made that the MSC Site is the source demonstrates that the MSC Site can not be the source because of the absence of other constituents found at the MSC Site in the wetlands sediments." According to STE:

> Because the assumption of a connection between the contamination at the two locations is unsubstantiated, the only scored component of environmental risk addressed in the HRS materials is unjustified and must be disregarded. Without this component, there is no basis to move forward with listing of the MSC Site on the National Priorities List.

STE stated that there are several other potential sources of the contamination found in the wetlands adjacent to Galveston Bay. STE acknowledged that the HRS documentation record at proposal names several of these potential facilities, including Monsanto South 20, the Gulf Coast Waste Disposal Authority (GCWDA) facility, and the Texas City Landfill. STE stated that the Tex-Tin site should be added to this list. According to STE, the Tex-Tin site is located 2.5 miles to the northwest of the MSC facility and is a "documented source of lead and chromium contamination in the area." According to STE, "[d]rainage from the Tex-Tin site and waste management units operated by other local industry has historically drained into Swan Lake."

In response to STE's comments asserting that the lead and chromium in the wetland samples did not originate from sources at the MSC site, Section 2.3 of the HRS states that an observed release has occurred if a contaminant is measured significantly above background if some portion of the release is attributable to the site. At the MSC site, chromium and lead were measured in ground water and sediment release samples at concentrations significantly above background sample concentrations from these same media, as described in the HRS documentation record at proposal (pages 49, 50, 56, and 59 and References 22 and 23). Ground water background samples were collected from locations in the Paleozoic channel aquifer up-gradient of the MSC site sources, up-gradient of the surface water sediment release samples, and down-gradient of any other potential sources of hazardous substance migration. These locations (BW-28A, BW-24, and MW-15U) were intentionally selected to capture any background levels of hazardous substances migrating from the Gulf Coast Waste Disposal Authority, the Monsanto 20 Wastewater Pond, or any other up-gradient sources (including Tex-Tin), as described on pages 54 through 64 of the documentation record at proposal. Except for arsenic, no hazardous substances were detected in any of these background ground water samples. Surface water sediment background samples were also collected from locations intended to capture any background levels of hazardous substances (SE-01 through SE-04). While chromium and lead were detected in each background sediment sample, the background concentrations of these hazardous substances were significantly lower than in the sediment release samples collected adjacent to the MSC facility (SE-05, SE-08 and SE-12), as described on pages 48 to 52 of the documentation record at proposal. These same hazardous substances were found in samples taken from the sources at the MSC site (see Reference 16 of the HRS documentation record at proposal). The sources at the MSC site are not fully contained to prevent releases.

In response to STE's suggestion that the lead and chromium in the wetlands adjacent to the MSC site may have originated at the Tex-Tin site, this theory is contradicted by sampling data from both the MSC site and the Tex-Tin site. The Tex-Tin site is located approximately 2.5 miles northwest of the MSC site. Until the late 1960's, a drainage ditch, known as the Wah Chang Ditch, drained the Tex-Tin site. The Wah Chang Ditch flowed from the Tex-Tin site, through the Swan Lake Marsh, and into Swan Lake, entering Swan Lake approximately 1 mile north of the MSC site. Sediment sample SE-09 was collected from Swan Lake in 1997 for the Malone Service Company Screening Site Inspection (see page 3 of Reference 22 of the HRS documentation record at proposal). Figure 5 of the 1998 Screening Site Inspection Report, Volume I, shows that SE-09 was collected from Swan Lake between the mouth of the Wah Chang Ditch and the wetlands adjacent to the MSC site, northwest of the PPE for the MSC site and MSC Level II release samples SE-05, SE-08, and SE-12 (see page 43 of Reference 4 of the HRS documentation record at proposal). The inorganic constituents detected at sediment sample location SE-09, include chromium at 8.3 mg/kg and lead at 11.8 mg/kg (see page 21 of Reference 22 of the HRS documentation record at proposal). Concentrations of chromium and lead detected at sediment sample locations SE-05, SE-08, and SE-12 (the release samples for the MSC site) exceed three times the concentrations detected at SE-09 as well as three times the background sample concentrations for the MSC site at sample locations SE-01 through SE-04. Based on these analytical data, EPA maintains that at least some portion of the lead and chromium contamination in the Swan Lake wetlands adjacent to the MSC site can be reasonably attributed to the sources at the MSC site.

According to HRS section 2.3:

> The minimum standard to establish an observed release by chemical analysis is analytical evidence of a hazardous substance in the media significantly above the background level. Further, some portion of the release must be attributable to the site. Use the criteria in Table 2-3 as the standard for determining analytical significance.

HRS Table 2-3 defines analytical significance as "3 times or more above the background concentration" when "the background concentration equals or exceeds the detection limit," as at the MSC site. Likewise, page 55 of the *Hazard Ranking System Guidance Manual*, (OSWER, EPA 540-R-92-026, November 1992) suggests that to confirm attribution for HRS purposes, one should document that at least one hazardous substance found in a release at a concentration significantly above background was produced, stored, deposited, handled, or treated at the site; and at least a portion of the significant increase could have come from a source at the site. Chromium and lead have been detected in sources at the MSC site, in ground water beneath the MSC site, and in wetlands adjacent to the MSC site in concentrations greater than three times background concentrations (samples SE-01 through SE-04) and greater than three times sediment sample SE-09.

Further support for the attribution of wetland contamination to the Malone site can be found in the administrative record for the Tex-Tin site. According to the *Final Report for Tex Tin Site, Swan Lake Marsh* (EPA's Environmental Response Team Center, March 2000), concentrations of chromium and lead in the sediments of the Wah Chang Ditch and the Swan Lake Marsh (which surrounds the ditch) decrease as the water flows east, through Swan Lake Marsh and into Swan Lake at the delta of the Wah Chang Ditch. The concentrations found at the delta of the Wah Chang Ditch are significantly lower than those found in the Swan Lake Marsh. The *Final Report* indicates that the highest concentrations of

metals, including chromium and lead, are found west of Swan Lake in the Swan Lake Marsh, north of the Wah Chang Ditch, at concentrations ranging from 49.4 mg/kg to 566 mg/kg of chromium and from 95.6 mg/kg to 723 mg/kg of lead. According to the *Final Report*, these concentrations decrease toward the south and east within the Swan Lake Marsh, along the Wah Chang Ditch and its tributaries, to a range of 19 mg/kg to 63 mg/kg of chromium and 64 mg/kg to 179 mg/kg of lead. The *Final Report* further indicates that sediment samples collected within Swan Lake, at the delta (near the mouth) of the Wah Chang Ditch, contain still lower concentrations of chromium and lead, ranging from 13 mg/kg to 57.8 mg/kg of chromium and from 36.8 mg/kg to 114 mg/kg of lead.

Thus, the concentrations of lead and chromium in sediments decrease as one moves from the Swan Lake Marsh to the delta formed where the Wah Chang Ditch enters Swan Lake. These concentrations continue to decrease as one moves, in Swan Lake, from the mouth (delta) of the Wah Chang Ditch toward the MSC site. These concentrations then increase, again, in the wetlands adjacent to the MSC site (where the release samples for the MSC site were collected). Given that the concentrations of lead and chromium in sediment samples decrease as one moves away from the Wah Chang Ditch (the former drainage of the Tex-Tin site), but then increase, again, as one moves towards the MSC site, it is reasonable to conclude that at least some portion of the lead and chromium contamination in the Swan Lake wetlands adjacent to the MSC site can be attributed to the sources at the MSC site.

The fact that more hazardous substances were found in the source samples at the MSC site than were found in the ground water and sediment release samples does not negate the conclusion that an observed release of chromium and lead has occurred at the site, as documented by the background and release samples. Many releases vary in concentration through time or occur sporadically, and specific substances may migrate at different rates or within different strata within a media. Random variables in sampling and/or laboratory techniques may also favor the detection of one hazardous substance over another, even if several are present in the media or sample.

To the extent that the commenters question the HRS criteria for determining when an observed release has occurred, these comments raise issues that are beyond the scope of this rulemaking. The HRS is a final rule and thus is binding on EPA. EPA does not have discretion to deviate from the HRS. The HRS was adopted in its final version on December 14, 1990 (55 FR 51532). This final adoption was preceded by an advance notice of proposed rulemaking on April 9, 1987 (52 FR 11513) and a notice of proposed rulemaking on December 23, 1988 (53 FR 51962).

In response to STE's comments about other potential sources, it is possible that future investigations at the MSC site will reveal additional sources on the properties named in the documentation record at proposal, by STE, or at other locations. The site and its boundaries are not defined strictly at the listing stage. Although all of the sources described in the HRS documentation record at proposal occur on the Malone Service Company property, this does not negate the possibility that other sources are contributing to the ground water and surface water contamination in the area. A site may consist of an identified area of known contamination with the sources less than fully specified. See Washington State Department of Transportation v. EPA, 917 F. 2d 1309 (D.C. Cir. 1990). In addition, even though the currently known contaminants of concern at this site are lead and chromium, this does not preclude the possibility that

other substances will need to be addressed in future remedial activities. Thus, STE's comments do not undermine EPA's basis for listing.

EPA notes that before any remedial action is taken, an RI/FS will be conducted and will provide more information on sources at this site. In addition, before any remedy is chosen, STE will have an opportunity to raise any concerns about additional sources. STE's comments on other potential sources do not affect the validity of the listing of this site.

Placing a site on the NPL is based on an evaluation, in accordance with the HRS, of a release or threatened release of hazardous substances, pollutants, or contaminants. However, the fact that EPA initially identifies and lists the release based on a review of contamination at a certain parcel of property does not necessarily mean that the site boundaries are limited to that parcel.

CERCLA Section 105(a)(8)(A) requires EPA to list national priorities among the known "releases or threatened releases" of hazardous substances; thus, the focus is on the release, not precisely delineated boundaries. Further, CERCLA Section 101(a) defines a "facility" as the "site" where a hazardous substance has been "deposited, stored, placed, or otherwise come to be located." The "come to be located" language gives EPA broad authority to clean up contamination when it has spread from the original source. On March 31, 1989 (54 FR 13298), EPA stated:

> HRS scoring and the subsequent listing of a release merely represent the <u>initial</u> [emphasis added] determination that a certain area may need to be addressed under CERCLA. Accordingly, EPA contemplates that the preliminary description of facility boundaries at the time of scoring will need to be refined and improved as more information is developed as to where the contamination has come to be located; this refining step generally comes during the RI/FS stage.

The revised HRS (40 CFR Part 300, Appendix A; 55 FR 51587, December 14, 1990) elaborates on the "come to be located" language, defining "site" as "area(s) where a hazardous substance has been deposited, stored, disposed, or placed, or has otherwise come to be located. Such areas may include multiple sources, and may include the area between the sources."

4.1.4 Conclusion

The original score for the Malone Services Company, Inc., site was 50.00. Based on the above response to comments, the site score remains unchanged. The final score for the Malone Services Company, Inc., site is:

Surface Water:	100
(Ground Water to Surface Water)	
Ground Water:	Not Scored
Soil Exposure:	Not Scored
Air Pathway:	Not Scored
HRS Site Score:	50.00

REGION 10

5.1 TAYLOR LUMBER AND TREATING, SHERIDAN, OREGON

5.1.1 List of Commenters and Correspondents

NPL-U34-3-13-1-R10	Comment dated January 31, 2001 from Steven P. Taylor of Maul Foster & Alongi, Inc., on behalf of Taylor Lumber and Treating
NPL-U34-5-13-R10	Correspondence dated September 27, 2000 from the Honorable John A. Kitzhaber, M.D., Governor of the State of Oregon

5.1.2 Site Description

The Taylor Lumber and Treating (Taylor Lumber) site is an active wood processing and treating business located approximately 1 mile west of Sheridan, Oregon. The wood treating facility began operation in autumn 1966. The wood treating facility's primary functions are to condition and pressure-treat wood products with preservatives in order to prolong the useful life of the products. Wood products treated at the facility include lumber, poles, pilings, posts, railroad ties, and plywood. Wood-preserving chemicals, which historically have been used at this facility and are still in use, include petroleum-based creosote and pentachlorophenol (PCP) solutions. Chemonite, a water solution of arsenic acid, copper salts, and zinc, was used on site from 1982 to September 1996. The finding of mercury in both soil and ground water samples at the facility suggests that mercury-containing biocide compounds might also have been used at some point in the facility's history.

Key factors in the HRS score at this facility are a sports fishery contaminated with hazardous substances that bioaccumulate, contamination of sensitive environments in both the surface water and the air pathways, arsenic contamination in the soil around residences, and arsenic and semi-volatile hazardous substances in the atmosphere in the vicinity of workplaces and residences. Five sources at this site are included in the HRS scoring. Sources 1, 2, and 3 are composed of contaminated soil. Source 4 is a pile of contaminated boiler ash and underground storage tank (UST) bioremediated soil waste. Source 5 consists of three surface impoundments used to retain stormwater and sediments before the water is passed through oil water separators.

A number of Federal response actions under CERCLA and RCRA have been carried out at this facility. In February 1999, EPA conducted an emergency removal action for a spill of approximately 3,500 gallons of 5%-PCP solution in P-9 oil. Heavy rain flushed the contaminants into drainage ditches and the South Yamhill River. Again in the fall of 1999, EPA carried out another emergency response to a spill of approximately 27,448 gallons of reclaimed creosote and wastewater containing PCP and creosote. The majority of the spill was contained within the on-site tank farm's secondary containment. However, a breach in the secondary containment was discovered when creosote oil was observed in the Rock Creek Road ditch. Product was observed to have flowed to within 100 feet of State Highway 18B before it was stopped.

In June and August 1999, EPA performed an Integrated Assessment (IA) at the facility to evaluate the site's potential for inclusion on the NPL and to assess the extent of contamination for subsequent removal actions. This included surface and subsurface soil sampling, ground water sampling, surface water and sediment sampling, and air sampling. The soil samples showed the presence of semivolatiles (including benzo(a)pyrene and PCP), toxic metals (including arsenic, copper, lead, mercury, and zinc), and a number of dioxins both in the operation areas of the facility and in drainage ditches that lead off site. The ground water sampling showed a large plume of non-aqueous phase liquids (NAPLs) in the vicinity of the treatment plant. The surface water and air sampling showed the migration of hazardous substances into the environmental media and to locations associated with human and environmental targets.

In September 1999 an EPA Action Memorandum determined that an imminent and substantial danger to the public health or welfare and the environment existed at Taylor Lumber that met the criteria for a time-critical removal. On November 5, 1999, EPA issued a Unilateral Administrative Order that described work that Taylor Lumber needed to complete as quickly as possible. Some of these activities were undertaken by EPA as part of a Fund-lead removal action. The time-critical removal actions taken under this Order were completed shortly before December 1, 2000, and include:

- Placing asphalt caps over hot spots of surficial arsenic contamination,
- Placing a soil-bentonite slurry wall around the worst of the NAPL contamination,
- Excavating hot spots of arsenic contamination from the drainage ditches,
- Storing contaminated soils in soil cells in an Area of Contamination,
- Improving the site drainage system and sending water through a surface water treatment system before release to the environment.

These actions are an interim solution to the worst of the contamination until a remedial investigation can be done and any necessary long-term remedial solutions determined. These interim removal actions have resulted in modifications in four of the five HRS sources that were assessed in the HRS documentation record at the time of proposal. Specifically:

- Portions of exposed contaminated soils in Sources 1 and 2 have been covered with asphalt caps. Other portions of the exposed soils and the subsurface contamination have not been addressed.

- The pile of boiler ash and bioremediated soils from a leaking underground storage tank, HRS Source 4, has been combined with other contaminated soils and moved to an interim on-site soil cell to await final remedial action.

- Contaminated sediments of Source 5 from two of the catchment areas associated with oil/water separators are located in the area that is enclosed by a soil/bentonite slurry wall and capped as part of the response action at Source 1, and a third catchment area has been filled and abandoned.

5.1.3 Summary of Comments/Correspondence

The Honorable John A. Kitzhaber, Governor of the State of Oregon, supported the proposed listing of Taylor Lumber as a Superfund site. He said that Oregon generally prefers to address these kinds of sites through the Department of Environmental Quality but that he recognized the long-standing relationship between Taylor and EPA and the momentum generated through the work of the recent removal program. He emphasized continued coordination with the State and the need to involve all potential stakeholders, including the Tribes, the local community, the business community, and local governments.

Steven P. Taylor, Professional Engineer with Maul Foster & Alongi, Inc., stated that Taylor Lumber objects to data used in the HRS documentation record and wants to make sure that the most accurate and up-to-date information on the site be used in determining whether the site should be included on the NPL. He said that the assessment of the site fails to include removal actions by EPA and Taylor Lumber that were concluded before proposal on December 1, 2000. These removal activities included substantial paving of HRS sources, the removal of soil stockpiled from response actions to an on-site containment structure, and the development of a stormwater treatment system that reduces the risk of contaminant exposure in the surface water pathway. These omissions, he said, led to erroneous documentation and assessment of the HRS sources available to the pathways and of source quantity and containment. Further, he stated that the term "significant," when used for analytical findings, was undefined and that sampling results should be compared against Oregon or EPA benchmarks for cleanup. He doubted the correlation between the detection of mercury at the Taylor facility and the City of Sheridan water intake and said that the drinking water targets should be scored for potential contamination rather than Level I concentrations. Mr. Taylor provided a reference that states that Winter Steelhead are the "only native anadromous fish in the watershed" and concluded that Coho Salmon should be removed from the assessment of surface water and air pathway targets. He also objected to the scoring of the air pathway on the basis of mercury when, he said, mercury was not found in the air samples and was not representative of the hazardous substances found at the site.

5.1.3.1 Support for Listing

Oregon Governor John A. Kitzhaber concurred with EPA's decision to list Taylor Lumber. He said that, although Oregon generally prefers to address these kinds of sites through the Department of Environmental Quality, he recognized the long-standing relationship between Taylor and EPA and the momentum generated through the work of the recent removal program. He emphasized continued coordination with the State and the need to involve all potential stakeholders, including the Tribes, the local community, the business community and local governments.

In response, EPA has added Taylor Lumber to the NPL. Although removal actions have already been conducted at this site, listing makes a site eligible for remedial action funding under CERCLA, and EPA will examine the site to determine what response, if any, is appropriate. Actual funding may not necessarily be undertaken in the precise order of HRS scores, however, and upon more detailed investigation may not be necessary at all in some cases. EPA will determine the need for using Superfund monies for remedial activities on a site-by-site basis, taking into account the NPL ranking, State priorities, further site investigation, other response alternatives, and other factors as appropriate.

The Superfund program offers numerous opportunities for public participation at NPL sites, in addition to commenting on proposed sites. The EPA Region 10 Office developed a Community Relations Plan (CRP) in February 2000. The CRP is the "work plan" for community relations activities that EPA will conduct during the entire cleanup process. In developing the CRP, Regional staff interviewed State and local officials and interested citizens in December 1999 to learn about citizen concerns, site conditions, and local history. This information will be used to formulate a schedule of activities designed to keep citizens apprised and to keep EPA aware of community concerns. Typical community relations activities include:

- Public meetings at which EPA presents a summary of technical information regarding the site and citizens can ask questions or comment.
- Small, informal public sessions at which EPA representatives are available to citizens.
- Development and distribution of fact sheets to keep citizens up-to-date on site activities.

An "information repository" has been established at the Sheridan Public Library, 142 NW Yamhill Street. This repository contains reports, studies, fact sheets, and other documents containing information about the site. The EPA Region 10 Office will continually update the repository and ensure that the facility housing the repository has copying capabilities.

After the RI/FS is completed and EPA has recommended a preferred cleanup alternative, the EPA Region 10 Office will send to all interested parties a Proposed Plan outlining the cleanup alternatives studied and explaining the process for selection of the preferred alternative. At this time, EPA will also begin a public comment period during which citizens are encouraged to submit comments regarding all alternatives. Once the public comment period ends, EPA will develop a Responsiveness Summary, which contains EPA responses to public comments. The Responsiveness Summary becomes part of the Record of Decision (ROD), which provides official documentation of the remedy chosen for the site.

In addition, EPA makes every attempt to ensure that community relations is a continuing activity designed to meet the specific needs of the community. Anyone wanting specific information on Taylor Lumber should contact the Community Relations Coordinator, Debra Packard, at U.S. EPA, 1200 Sixth Avenue, Mail Stop ECO-081, Seattle, WA 98103.

5.1.3.2 Removal Actions

Mr. Taylor stated that the HRS documentation record and score sheets do not take into account work completed prior to proposal by EPA and Taylor Lumber under a Unilateral Administrative Order. This response work included asphalt paving to cover “a majority” of HRS contaminated soil sources 1, 2, and 5, moving the pile of boiler ash and UST bioremediated soil, Source 4, to an on-site cell that is covered by soil and two layers of geomembrane, and the new stormwater treatment system that “has greatly reduced contaminant exposure via the surface water pathway.” He pointed out that these response actions significantly change the nature of the exposure pathways and cited specific changes in

documentation and scoring required for source descriptions, source hazardous waste quantity, source containment against release, and the availability of source material to the pathways.

In response, EPA's policy is to consider certain removal actions to increase incentives for rapid response actions at sites. The preamble to the HRS discusses consideration of such removal actions in the assignment of HRS scores (Section Q of the preamble of the HRS, 55 FR 51568, December 14, 1990). According to Section Q, EPA will calculate waste quantities based on "current conditions," which may differ from initial conditions, as the result of a response action; however, the preamble notes that this approach must ensure that "the HRS score reflects any continuing risk at sites where contamination occurred prior to any response action" and that "the accuracy of this approach depends on being able to determine with reasonable confidence the quantity of hazardous constituents remaining in sources at the site and the quantity released to the environment." The preamble further states that "removal actions may not reduce waste quantity factor values unless the quantity of hazardous constituents remaining in sources and in releases can be estimated with reasonable confidence" and that "parties undertaking removal actions will have primary responsibility for collecting any data needed to support a determination of the quantity of hazardous constituents remaining." Thus, the parties arguing for a change in HRS score have the burden of providing the information to support such a score change.

EPA has reexamined the site score in the light of the removal actions mentioned by Mr. Taylor. For the surface water and air pathways, no change in the overall score would result even if the site was scored on current conditions rather than initial conditions. In some instances, Taylor has performed the response actions but has not provided EPA with sufficient information to accurately apply the HRS. In those cases, EPA has left the pertinent HRS factor values unchanged. The soil exposure pathway has been rescored on the basis of current conditions, as explained in Section 5.1.3.2.5 of this support document. Again, no change in the overall site score results, and the site remains eligible for the NPL regardless of the removal actions. The details of EPA's evaluation of the site based on current conditions are discussed in the following sections.

5.1.3.2.1 Capping of Portions of Sources 1 and 2

Mr. Taylor pointed to specific places in the description of Sources 1 and 2 where reference is made to "exposed soil" and said that "a substantial portion" or "much of the area" of the exposed soil is now covered by engineered asphalt caps. Mr. Taylor said that the descriptions of containment for the two sources are incorrect because they do not reflect the capping of much of the two sources. He claimed that the sampling points that now lie under the caps should be deleted from Tables 1 and 2, which document the presence of hazardous substances detected in the sources and from the calculations of source area. He also said that Source 1 is "supposed to be limited to 'exposed soil'" and requested that the sampling results for all subsurface samples be dropped from Table 1 and that the value for hazardous waste quantity for the air pathway be revised to account for the engineered asphalt cap installed at Sources 1 and 2.

In response, the consideration of the partial capping of Sources 1 and 2 in the HRS evaluation of the site would not alter the HRS site score. Portions of both sources remain uncapped. Therefore, the values of

containment are unchanged for the uncapped areas. Further, the capped portions of the sources receive a containment value of 9 from HRS Table 4-2 (*Containment Factor Values for Surface Water Migration Pathway*) because, although they have an engineered asphalt cover that Taylor is required to maintain, they lack a liner underneath the sources and a functioning leachate collection and removal system immediately above the liner. They also may lack a "functioning and maintained run-on control system and run-off management system." EPA does not have any report from Taylor documenting that the grading of the site to direct storm water to the storm water treatment system (SWTS) resulted in a structure to prevent run-on for each of the capped areas and to treat any run-off from each of the capped areas. Because the entire area of each source (both capped and uncapped) has a containment value greater than 0, the entire volume of each source and all the hazardous substances within that volume are considered available to the surface water pathway (HRS Section 2.2.3, *Identify hazardous substances available to a pathway*). No change in the evaluation of area or hazardous substances available to the surface water pathway results.

With respect to Mr. Taylor's request that the subsurface samples for Source 1 be deleted from consideration because the sources are described as "exposed soils," Mr. Taylor has misunderstood the HRS definition of a source (HRS Section 1.1, *Definitions*). The source includes those soils that have become contaminated by migration from the original place of deposit. The subsurface samples that document contamination define the vertical extent of this source and are properly included in the listing of hazardous substances associated with the source. The HRS documentation record at the time of proposal emphasizes that the soil is exposed in describing these two sources because this is the most immediate threat that these sources pose to runoff and to air entrainment. The exposed soil was emphasized to better inform the public of site conditions. The entire volume of the sources is, however, of remedial concern inasmuch as it may be disturbed and exposed in the future and also represents an ongoing potential for further migration to ground water and the possibility of discharge to surface water.

With respect to the air pathway, even if the capping of portions of Source 1 and 2 were taken into account, no difference in the HRS values for the air pathway would result. Portions of both sources remain uncapped. Therefore, the values of containment, which are based on the uncapped areas of each source, are unchanged. The pathway value for hazardous waste quantity and the listing of hazardous substances available to the air pathway also remain unchanged even though a portion of each source has an "essentially impermeable, regularly inspected, maintained cover" (HRS Table 6-9, *Particulate Containment Factor Values*). The reason for this is that each source, as an entity, has a particulate containment factor value greater than 0 (HRS Section 2.3.3, *Identify hazardous substances available to a pathway*).

While not relevant to the HRS score, the removal action was not designed to be a permanent remedy. The removal action report issued by EPA Region 10 (*Taylor Lumber and Treating Removal Action Report, Sheridan, Oregon,* dated January 2001, added to the record as Reference 27 to the revised HRS documentation record) describes the cleanup goals of the removal action (RA) on pages 3-11 and 3-12 as:

> Cleanup goals for an RA are based on the RA's time-critical nature. Because of the determination that there is an immediate threat to public health or welfare or the environment, the RA addresses only those actions or remedies that would stop that

threat. Once the threat is removed, the EPA Remedial Project group will oversee cleanup at the site.

The capping of the areas of contaminated soil in Source 1 and Source 2 was based on the Oregon Pre-calculated Hot Spot Level for industrial land-use. The action level for arsenic was set at 300 mg/kg. This level is many times higher than would be considered protective of human health for remedial cleanup. Other contaminants were not even considered, although they were present.

Although the capped areas in Source 2 cover the hot spots of arsenic that were identified by field sampling, arsenic levels at 24 of the 26 sampling locations outside the cap show contamination at levels that are above background. One sample showed 778 mg/kg of arsenic (OS-02, Table 6-10 of Ref. 8 at the time of proposal). Further, Figure 3-5 (Ref. 8) of the report shows that sampling points PS-07 and PS-14, which the commenter claimed to have been covered, lie outside the cap. Concentrations reported in Ref. 8, Tables 6.5, 6.6, and 6.7, of the HRS documentation record show sampling location PS-14 to be particularly contaminated with semi-volatiles including benzo(a)pyrene and PCP (960,000 ug/kg), arsenic and other toxic metals, and a toxic equivalent quotient (TEQ) value for 2,3,7,8-tetrachlorodibenzodioxin of 1734 ng/kg (Tables 6-5, 6-6, 6-7, 6-10, and 6-11 of Ref. 8 at the time of proposal). Sampling point PS-07 is also contaminated with a number of substances, as are the eight additional sampling points that defined Source 2 but were not covered by the removal action (OS-01, OS-02, PS-01, PS-02, PS-03, PS-05, PS-11, and PS-12).

The extent of the capping at Source 1 was not primarily based on the concern for surficial arsenic concentrations but on the concern that NAPLs under the treatment plant area may migrate to ground water and ultimately to surface water. The selected removal action was to place a soil-bentonite slurry wall around the area, cap the surface of the area to hinder infiltration, and install a ground water extraction system. PCP was identified as the key contaminant of concern. The EPA soil screening level (SSL) for this substance is 0.03 mg/kg. As the removal action report notes, “The SSL for PCP was so low that virtually the entire site would have been surrounded by a barrier wall. The costs for this type of action were too high so the action was ruled out.” (Page 3-11) Rather, a level 30 times higher was selected. The report continues: “When the revised SSL of 0.9 mg/kg for PCP was evaluated, it was found that a barrier wall surrounding the area in which PCP was equal to or lower than 0.9 mg/kg would be cost-effective and would meet the time-critical nature of the RA.”

The substantial subsurface contamination at Source 1, particularly the large plume of NAPLs, was not remediated by the slurry wall. Rather, the slurry wall was designed to surround hot spots of PCP and to hinder further contamination at these hot spots from reaching the subsoils, the ground water, and the river to which the ground water discharges. As already noted, there is also substantial surface and subsurface contamination outside the slurry wall and capped area.

The caps that were placed on portions of Sources 1 and 2 included two feet of fine base aggregate to provide stability and two layers of hot mixed asphalt concrete of two inches each for a total of four inches, as described in the Removal Report. This response was taken by EPA as an interim measure to reduce the immediacy of threat and to avoid the expense of placing a final cap when the sources

themselves might later be removed for off-site disposal. The caps are designed to only last for 3 to 5 years and are likely to crack and break up if heavy equipment is driven over them. If, at the completion of the RI/FS, the determination was made that on-site storage is to be the final remedy, additional asphalt would be required to meet usual closure standards. Additional areas that are contaminated may also require cover to meet EPA remedial standards.

The impact of all of the removal activities to the score for the soil exposure pathway is discussed in Section 5.1.3.2.5 of this support document.

5.1.3.2.2 Moving Source 4 to an On-Site Soil Cell

Mr. Taylor stated that the pile of boiler ash and UST bioremediated waste that comprises Source 4 was used by the EPA Removal Program to construct a container structure for contaminated soil excavated from other sources at the site and, therefore, is now "under two layers of geomembrane cover and additional soil stockpiled by the EPA removal program." He concluded that Source 4 can no longer be defined as exposed soil and, therefore, should be removed from the HRS documentation record. He pointed out that stormwater no longer comes in contact with the material in Source 4 because that material has been removed to the soil cell and requested that Source 4 be removed from the evaluation of hazardous waste quantity for the three threats (drinking water, human food chain, environmental) of the surface water pathway. Mr. Taylor also stated that the descriptions of containment for the air pathway are incorrect because they do not reflect the fact that the soil is no longer exposed. He concluded that the value for hazardous waste quantity should be revised to account for the engineered asphalt cap installed at Sources 1 and 2 and for the elimination of exposed soils at Sources 4 and 5.

In response, even if the removal action was taken into account, the waste that was evaluated as Source 4 still remains on site. The gathering of this waste into soil cell 3, which is now located over some of the area that was occupied by Source 4, does not exclude this material from the consideration in HRS scoring. EPA disagrees that this source material should be dropped from consideration. The surface water containment value for the soil cell is 10 (HRS Table 4-2, *Containment Factor Values for Surface Water Migration Pathway*). Contrary to Mr. Taylor's claims, the soil cell is covered by a single layer of reinforced plastic secured in place by sandbags. There also is no maintained engineered cover and no leachate collection and removal system. The construction of the soil cells is described in the EPA's START contractor's report of the removal action (*Taylor Lumber and Treating Removal Action Report, Sheridan, Oregon*, dated January 2001, added to the record as Reference 27 to the revised HRS documentation record) as "solely to facilitate the time-critical RA [removal action] at the Taylor Lumber and Treating site, and it will be an interim measure until final disposition of the soils is determined as part of the long-term cleanup." (Page 3-9). Further, Taylor Lumber has provided EPA with no evidence that the recontouring of the site to direct stormwater through the SWTS resulted in a "functioning and maintained run-on control system and runoff management system" specific to the soil cells. Because the soil cell has a surface water containment value greater than 0, the contents of the cell are considered available to the surface water pathway (HRS Section 2.2.3, *Identify hazardous substances available to a pathway*) and properly included in the HRS evaluation of that pathway. The hazardous waste quantity values for the three threats of the surface water pathway remain unchanged because the containment

values for the waste in Source 4 are greater than 0, whether the original location or the current location of the waste is considered.

With respect to the air pathway, the removal of the contents of this source to soil cell 3 is not relevant to the HRS evaluation. The cover on this soil cell has not been documented by Taylor to be "essentially impermeable," as would be required to warrant an HRS containment factor value of 0 (HRS Table 6-9, *Particulate Containment Factor Values*). Neither is the source "covered with liquids" or covered with greater than 3 feet of uncontaminated soil cover and "substantially vegetated," alternative conditions that would merit an HRS containment factor value of 0. As a result, no change in the evaluation of the air pathway is required. It should be noted that, even if the cover to soil cell 3 were adequate to prevent migration of the underlying materials, no change in HRS score would result. Footnote b for HRS Table 2-6 (*Hazardous Waste Quantity Factor Values*) states that, if hazardous constituent quantity is not adequately determined for the sources at the site, the value for hazardous waste quantity for the pathway is to be assigned from the text of HRS Section 2.4.2.2 (*Calculation of hazardous waste quantity factor value*) rather than from HRS Table 2-6. Section 6.2.2 of the HRS documentation record at the time of proposal shows that hazardous constituent quantity data are not complete at any of the five sources. The text specifies that when any target for a migration pathway is subject to Level I or Level II concentrations, the value 100 is assigned for hazardous waste quantity for that pathway. In Section 6.3 of the HRS documentation record at the time of proposal, air pathway targets are shown to be exposed to both Level I and II concentrations. The value of 100 for the pathway hazardous waste quantity would be the same value as is assigned when Source 4 is included as an eligible source for the air pathway.

It should also be noted that the dropping of Source 4 from consideration for the air pathway would also have no impact on the selection of mercury as the substance evaluated for toxicity/mobility (HRS Section 6.2.1, *Toxicity/mobility*). Mercury was not found in Source 4 but at a number of other locations such as OS-09, the north and south railroad ditches and the west ditch. Although some of these locations may have been addressed in Taylor's removal action (excavation of contaminated soils and sediments from the drainage ditches on the north and east sides of the site, grading all soils and ditches so that stormwater is directed to the SWTS), EPA has not received sufficient information from Taylor to judge whether mercury was removed from all of those sampling locations or covered by more than three feet of clean fill and "substantially vegetated with little or no exposed soil." (HRS Table 6-9, *Particulate Containment Factor Values*).

5.1.3.2.3 Abandonment or Capping of Source 5

Mr. Taylor said that, as a result of the removal action, the "easternmost ditch segment was filled as a part of the abandonment associated with the construction of " the storm water treatment system (SWTS), and the two western segments have been paved and now discharge to the SWTS rather than directly to the NPDES outfall. He concluded that, because this source has been either capped or is no longer in use, it should be dropped from the HRS documentation record and, particularly from the assessment of area for hazardous waste quantity. He also requested that Source 5 be removed from the evaluation of hazardous waste quantity for the drinking water, human food chain, and environmental threats of the surface water pathway. Further, he said that the value for hazardous waste quantity for the air pathway should be revised to account for the elimination of exposed soils at Source 5.

In response, as suggested by Mr. Taylor, the two western segments are located in the area that is enclosed within the soil-bentonite slurry wall and capped as part of the response action for Source 1. If the removal action of capping was taken into account, the surface water containment value for these two segments is 9, as already discussed for Sources 1 and 2. For the segment that was, according to Mr. Taylor, "filled as part of abandonment associated with construction of the SWTS and is no longer in use," Taylor has not provided information on whether wastes were removed from this segment, on the nature and depth of the fill, and whether the final cover and contouring constitutes a "maintained engineered cover" or a "functioning and maintained run-on control system and runoff management system" for this specific area (HRS Table 4-2, *Containment Factor Values for Surface Water Migration Pathway*). For instance, it is unclear whether the contouring of the site performed by Taylor prevents stormwater from flowing over this source or instead directs stormwater over the source as a path to the SWTS. As a result, both the capped and the abandoned segments of this source are properly assigned containment values greater than 0 and are considered available to the surface water pathway (HRS Section 2.2.3, *Identify hazardous substances available to a pathway*). The evaluation of hazardous waste quantity for the surface water pathway remains unchanged.

For the air pathway, the two segments that lie within the capped area that also partially covers Source 1 would receive a particulate containment value of 0 because these two segments are now covered with an "essentially impermeable, regularly inspected, maintained cover." (HRS Table 6-9, *Particulate Containment Factor Values*). Therefore, the waste quantities associated with these two segments could be dropped from consideration for the air pathway. However, the quantity associated with the ditch segment that was filled by Taylor would not be dropped from consideration because, as discussed above, Taylor has failed to provide the documentation required to establish a 0 value for containment (e.g., uncontaminated soil cover greater than three feet deep that is "substantially vegetated with little or no exposed soil" as specified in HRS Table 6-9, *Particulate Containment Factor Values*). Although the dropping from consideration of the two capped segments would reduce the source hazardous waste quantity from 34.62 to 11.54 for the air pathway, this would have no effect on the value for hazardous waste quantity for the air pathway. As already explained for Source 4, when hazardous constituent quantity is not adequately determined for all sources and when any targets within the pathway are subject to Level I or II concentrations, the minimum value assigned for hazardous waste quantity is 100.

5.1.3.2.4 Redirection of Outfalls from the Site

Mr. Taylor said that Outfalls 001, 002, and 003 were abandoned during the construction of the storm water treatment system (SWTS) and that stormwater is now collected and routed through the SWTS and is discharged after treatment to a location south of the previous location of Outfall 003. He said that the description of the hazardous substance migration path for the surface water pathway should be changed accordingly.

In response, this change in the routing of these discharges has no impact of the HRS scoring of the site and the surface water pathway in particular because Outfalls 001, 002, and 003 and the new outfall all discharge to the Rock Creek ditch and hence, by overland flow, to the same probable point of entry, PPE 2. The fact that stormwater flows from the site are now diverted through a stormwater treatment system does not negate the documentation of an observed release from the site at PPE 2. Unknown quantities of

hazardous constituents have been discharged to the South Yamhill River via this PPE as shown by the documentation of observed releases to surface water in Section 4.1.2.1.1 of the HRS documentation record at the time of proposal and may remain a continuing threat to human health and the environment.

5.1.3.2.5 Impacts of Removals on the Soil Exposure Pathway

Mr. Taylor said that the hazardous waste quantity factor value for the soil exposure pathway should be recalculated. He claimed that the areas of exposed soil for Sources 1 and 2 should be revised to account for the engineered asphalt cap and that Sources 4 and 5 should be eliminated from the calculations because they no longer contain exposed soils.

In response, the soil exposure pathway estimates the threat to persons or environments of exposure to hazardous substances where those substances are currently located. The removal action has resulted in the capping of portions of the documented surficial contamination in Sources 1 and 2, the storage of the material in Source 4 in soil cell 3, and the abandonment or capping of the catch areas or "ponds" that made up Source 5. Based on these actions:

- For Source 1, EPA has revised the quantity value for the area of contamination associated with the source to ">0." The capped area is excluded from consideration because it is covered by "a permanent, or otherwise maintained, essentially impenetrable material" (HRS Section 5.0.1, *General Considerations*). The residual area that has been left uncapped has not been carefully measured but is known to be greater than 0 because 12 surficial sampling points, OS-06 through OS-11 and TP-01, TP-05, TP-07, TP-17, TP-19, and TP-25, document observed contamination (HRS Section 5.0.1, *General Considerations* and HRS Documentation Record Table 1).

- For Source 2, whereas much of the source was paved, it is not certain how much of the source remains exposed following the removal action. As discussed in Section 5.1.3.2.1 of this support document, *Capping of Portions of Sources 1 and 2*, the continued presence of elevated concentrations of arsenic at sample locations outside the paved area demonstrates that the area of this source is still greater than 0.

- Source 4 is now stockpiled in soil cell #3 close to its original location. The construction of this cell is: a liner, 2 feet of bermed clean fill above the liner, contaminated soils from the site, and a reinforced plastic cover secured in place by sandbags. This structure is to provide interim protection against migration of hazardous substances but fails to be protective against direct exposure for HRS purposes. The HRS instructs that an area with documented contamination is excluded from the area of observed contamination if it is "covered by a permanent, or otherwise maintained, essentially impenetrable material (for example, asphalt)." (HRS Section 5.0.1, *General Considerations*). Although Taylor Lumber is required to inspect and maintain the cover weekly, the cover secured with sandbags is not the impenetrable cover that the soil exposure pathway describes under general considerations in Section 5.0.1. The footprint of Cell 3 is shown in the Removal Action Report (Figure 3-11, *Contaminated Soil Cell Sample Locations*) to be approximately 25,240 square feet. The divisor used to calculate a value for hazardous waste quantity for a pile in the soil exposure pathway is 34 (HRS Table 5-2, *Hazardous Waste Quantity*

Evaluation Equations for Soil Exposure Pathway). The quantity value for Source 4, given that it has now been moved to Cell 3, is 742.35.

- For Source 5, the two segments that are now under the cap that also partially covers Source 1 have been dropped from consideration for the soil exposure pathway (see discussion of Source 1, above). The third or eastern segment is, however, retained because Taylor has not provided information showing that the hazardous substances were either removed from this source or are now covered by more than two feet of clean fill or that they are covered by a permanent or otherwise maintained, essentially impermeable material (HRS Section 5.0.1, *General Considerations*). The assigned value for a 150 square foot buried surface impoundment (the area of the third or eastern segment) is 11.54 (HRS Table 5-2, *Hazardous Waste Quantity Evaluation Equations for Soil Exposure Pathway*).

The result of these changes is to reduce the total Soil Exposure Pathway waste quantity value shown in Table 18 of the HRS documentation record at the time of proposal from 3,042.12 to 754.95. Both the original value and the revised value are assigned the value 100 for the pathway hazardous waste quantity by HRS Table 2-6, *Hazardous Waste Quantity Factor Values*). No change in HRS values or scores results from this reevaluation of hazardous waste quantity for the soil exposure pathway.

5.1.3.3 Surface Water Overland Flow Path

Mr. Taylor said that the implication that water from Outfall 005 travels to the Rock Creek Road ditch is in error. Rather, he said, water from Outfall 005 is blocked from Rock Creek Road Ditch by an elevation rise and, instead, crosses under Highway 18 through a culvert in close proximity to the outfall and drains to the South Yamhill River. He also noted that the HRS documentation record incorrectly states that Source 5 discharges through Outfall 001.

In response, Mr. Taylor's description of the path of stormwater flow from Source 3 appears to be accurate, as evidenced by Ref. 8., Figure 8-1, at the time of proposal. This site map shows what appears to be a barrier to flow from Source 3 to the Rock Creek Road ditch. The HRS documentation record at the time of proposal has been revised to reflect this change. The fact that Source 3 may drain directly to the South Yamhill River between Rock Creek and PPE 2, rather than to the Rock Creek Road ditch and through PPE 2, has no bearing on the HRS evaluation. The locations of the overland flow path and PPEs are used for HRS purposes in determining the target distance limit (TDL) for a site. This change in the definition of the overland segment of the hazardous substance migration path for the surface water pathway has no impact on the HRS evaluation or score for the site. As directed in Sections 4.1.1.1 *Definition of hazardous substance migration path for overland/flood migration component* and 4.1.1.2 *Target distance limit*, of the HRS, the in-water segment for a site extends 15 miles from the PPE for all sources at the site. The overland segment of the hazardous substance migration path for this site is described on page 38 of the HRS documentation record at the time of proposal. Discharge from the south side of the railroad tracks to Rock Creek remains the most upstream PPE and discharge along the Sheridan Forest Products ditch to the South Yamhill River at river mile 41 remains the most downstream PPE (see Reference 8 of the HRS documentation record as proposed, pages 2-4 and 2-5, Figure 3-4). The revised TDL for this source is encompassed in the TDL for these other sources.

The HRS documentation record has been corrected to reflect that Source 5 historically discharged to Outfall 003 rather than Outfall 001. This correction in the description of surface runoff discharge has no impact on the description of the hazardous substance migration path for the surface water pathway or on the overall score for the site.

Further, the interim containment of the soil cell (HRS Source 4) and the redirection of surface runoff through the SWTS would not negate that the hazardous substances that have already migrated along the overland segment of the surface water migration path and have been discharged to surface water. The HRS defines a source to include soils that have become contaminated by subsequent migration (HRS Section 1.1, *Definitions*). Contamination is shown in the HRS documentation record at many locations within the drainage ditches, including locations that were not subject to removal (pages 55 through 60). Observed releases to surface water sediments and/or water are also documented in Rock Creek and the South Yamhill River (HRS Documentation Record at proposal, pages 55 through 60). The value assigned to likelihood of release in the HRS is based on "the likelihood that waste has been or will be released to the environment." (HRS Section 2.3, *Likelihood of release*) The fact that the probability of future releases may be reduced by the SWTS does not negate the fact that hazardous substances have been released to surface water and that unknown quantities may remain in the associated sediments.

5.1.3.4 Source Type for Source 5

Mr. Taylor said the three ponds that the HRS documentation record refers to and evaluates are actually ditch segments and that these ditch segments "were not intended, installed, or maintained as sedimentation ponds, retention ponds, holding ponds or any kind of pond. Historically, their whole purpose was to convey stormwater to the outfall 003 oil/water separator."

In response, with respect to the purpose of the ponds and their classification as surface impoundments, EPA points out that as described on page 32 of the HRS documentation record at proposal, each of the ponds is followed by an oil/water separator. The purpose of these ponds is to retain oily stormwater and sediment through settling before the stormwater is passed through the oil/water separators. The separators function as a dike or modification that lead to the retention of the waste water in the ponds. The oil/water separators are identified in Appendix A of Reference 8 at the time of proposal as Solid Waste Management Units (SWMU) 13 and 14 (Figure A-1), and the retention areas are shown as associated with the oil/water separators in Figures 3-4 and 8-3 of HRS Reference 8. Whether they were originally designed to be ponds or not, they functioned as surface impoundments for this wastestream. They were structures where liquid wastes were placed, stored for some period of time, and from which the deposited contamination could migrate. For HRS purposes, these "ponds" were correctly evaluated as sources. For HRS purposes, a source is defined as "any area where a hazardous substance has been deposited, stored disposed or placed..." (Section 1.1, *Definitions*, of the HRS). That they are classified as surface impoundments is consistent with the HRS and Agency guidance in that these sources were used to contain liquid wastes and had no soil cover. (See HRS Table 2-5, *Hazardous Waste Quantity Evaluation Equations*, and pages 41 and 42 of the *Hazard Ranking System Guidance Manual, Interim Final.* EPA 540-R-92-026). If the removal action at Source 5 was taken into account, the ponds would be properly described as "Surface impoundment (buried/backfilled)" in HRS Table 2-5, *Hazardous Waste Quantity Evaluation Equations*, and would be assigned the same divisor and value.

5.1.3.5 The Term "Significant"

Mr. Taylor objected to the use of the term "significant" as used to describe sampling results in the HRS documentation record. He said that the term is not defined, has no meaning in relation to endangerment of human health and the environment, and should be applied only to concentrations that are at or above State soil cleanup standards for industrial facilities or EPA preliminary remediation goals for industrial facilities. He concluded that references to samples that do not exceed such cleanup or remediation standards should be deleted from the HRS documentation record.

In response, the term "significant" is used in the HRS documentation record as it is used in Section 2.3 of the HRS, *Likelihood of release*. When an analytical finding is termed "significant," it means that the concentration of the substance is sufficiently higher than its background level to ensure that the difference in concentrations observed is an actual increase in concentration and not likely to be due simply to analytical sample result variation. A conservative approach to the definition of significance is found in HRS Table 2-3 (*Observed Release Criteria for Chemical Analysis*). This table specifies the minimum requirement for documenting an observed release (HRS Section 2.3, *Likelihood of release)* and for documenting an area of observed contamination for the soil exposure pathway (HRS Section 5.0.1, *General considerations*). Essentially, if the background level is undetected, the release concentration must meet or exceed the sample quantitation limit. If the background level meets or exceeds the detection limit, the release concentration must not only meet or exceed the sample quantitation limit but must be three times or more the background level. These criteria protect against "false positives" where the release concentration is likely to exceed the background level by chance alone or where a substance in the sample may be present as a natural component of the soil rather than from a release.

The term "significant" in the HRS does not include any comparison to health-based or environmental criteria or to cleanup standards. It only means that the substance had been documented to be present in a sample above its background level. The issue of whether the concentration of a hazardous substance requires response action, either removal or remedial, goes beyond the scope of the HRS and is determined in the investigation phases of removal or remedial actions.

5.1.3.6 The Surface Water Pathway: The Sheridan Intake

Mr. Taylor claimed that EPA has not "demonstrated that there is a correlation between the detections of mercury at Taylor Lumber's facility and the detection of mercury at the City of Sheridan drinking water intake. He said that the HRS documentation record does not include the analytical data from five surface water samples (YR-04-SW, YR-05-SW, YR-08-SW, YR-10-SW, YR-12-SW) "collected between Taylor Lumber and the Sheridan drinking water intake that show consistent mercury concentrations below the current USEPA drinking water standard (MCL) for mercury of 2 ug/L as well as the USEPA Region 9 PRG for mercury in tap water of 11 ug/L."

Mr. Taylor also claimed that the mercury concentration at the drinking water intake should not be scored as Level I concentrations but as potential contamination. He stated that the concentration of mercury in sample YR-02-SW should be 2.7 ug/L, not 2.7 mg/kg. He also said that the unit stated in the HRS

documentation record for the health based benchmark for mercury is incorrect, being stated in mg/kg. He said that if this benchmark concentration is intended to be stated in mg/L, as is the EPA Region 9 PRG for mercury in tap water at 0.011 mg/L, then the detected concentration at the intake is lower than the benchmark.

In response, EPA agrees that insufficient documentation to attribute the mercury at the Sheridan drinking water intake to a release from this site was contained in the HRS documentation package at proposal. EPA has removed this identification from the HRS scoring. The HRS score for the drinking water threat drops from 100 to 1.11 (HRS documentation record, page 2, Surface Water Overland/Flood Migration Component Scoresheet). The target value for Nearest intake is 0 (HRS Section 4.1.2.3.1, *Nearest intake*) based on a stream flow greater than 1,000 cubic feet per second. The assigned value for a drinking water intake serving between 1,001 and 3,000 people, subject to potential contamination, and located on a large stream or river (1,000 to 10,000 cubic feet per second average annual flow) is 2 (HRS Table 4-14, *Dilution-weighted population values for potential contamination factor for surface water migration path*). This value is multiplied by 1/10 for potential contamination (HRS Section 4.1.2.3.2.4, *Potential contamination*). The value assigned to *Resources* on the scoresheet remains unchanged at 5. No change in site score results from this decision and more detailed investigation of mercury contamination from the site may follow listing. The score for the human food chain threat remains 96.06 and the score for the environmental threat remains 60, giving a pathway score of 100 (HRS documentation record at proposal, pages 3 and 4). As a part of these changes in the HRS documentation record, the errors in units of measurement noted by Mr. Taylor have been removed.

5.1.3.7 The Air Pathway: Waste Characteristics

Mr. Taylor stated that arsenic, rather than mercury, should be used in assigning the value for toxicity/mobility in the air pathway because mercury was not found in air samples and because arsenic is more representative of the hazardous substances at the facility.

In response, HRS Section 6.2 (*Waste Characteristics*) for the air pathway defines the hazardous substances available to migrate to the atmosphere not only as those found in an observed release to the atmosphere but also all gaseous or particulate substances associated with a source that has a gas or particulate containment factor value greater than 0. Mercury was found at a number of locations in surficial soils that were not subject to the removal action (e.g., OS-09, WD-01, RCD-02, or SRD-01 through –06, Reference 8). These sampling locations are not covered by greater than 3 feet of uncontaminated soil that is “substantially vegetated with little exposed soil” (HRS Table 6-3, *Gas Containment Factor Values*).

Furthermore, the HRS does not evaluate whether a substance is “representative” in the selection of substances available to the air pathway. The assignment of toxicity/mobility based on mercury is consistent with the HRS (see pages 113 and 114 of the HRS documentation record as proposed). To change this factor value to be based on arsenic would be contrary to the HRS. HRS Section 6.2.1.3 *Calculation of toxicity/mobility factor value*, states “Use the hazardous substance with the highest toxicity/mobility factor value to assign a value to the toxicity/mobility factor for the air migration

pathway." The HRS simply requires that the constituent be documented to be present and not fully contained against release to air. (HRS Section 6.2, *Waste Characteristics*).

5.1.3.8 Surface Water and Air Targets: The Presence of Coho Salmon

Mr. Taylor requested that Coho Salmon be removed from the documentation and assessment of sensitive environments subject to Level II concentrations for the surface water pathway and of environmental targets subject to actual contamination for the air pathway. He provided a reference that states that winter Steelhead are the "only native anadromous fish in the watershed." He also presented minutes from the Yamhill Basin Council that state that "winter Steelhead are the only anadromous fish in the watersheds."

In response, the Coho Salmon has been dropped from the evaluation of environmental targets in the surface water and the air pathways. The impact of this change in the surface water pathway is to reduce the value of sensitive environments subject to Level II concentrations from 325 to 150 (HRS documentation record page 83). This reduces the value of environmental targets in the surface water scoresheet (HRS documentation record at proposal, page 4) to 150.05. No change, however, results in the score for the environmental threat because the maximum score is 60 (HRS Section 4.1.4.4, *Calculation of environmental threat score for a watershed*), and this value is exceeded even with 150.05 target points.

In the air pathway, the result is similar. The value for sensitive environments subject to actual contamination is dropped from 275 to 150 (HRS documentation record at proposal, page 120). To this sum, 275 points are added for wetlands that are subject to actual contamination, giving a total of 425 for the Actual Contamination Factor Value (HRS documentation record, page 124). When this revised value is entered into the air pathway scoresheet (HRS documentation record at proposal, page 6), the pathway score remains unchanged at 100, its maximum value.

5.1.4 Conclusion

The original score for Taylor Lumber and Treating was 71.78. Based on the above response to comments, the overall site score remains unchanged. The final scores for the Taylor Lumber and Treating site are:

Ground Water	Not Scored
Surface Water	100.00
Soil Exposure	24.73
Air Pathway	100.00
HRS Score	71.78