UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
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SEP 2 1992

REPLY TO THE ATTENTION OF:

MEMORANDUM

SUBJECT: Michigan Act 307 and the Superfund Process

FROM: Larry Kyte, Acting Branch Chief
Solid Waste and Emergency Response Branch

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Office of Superfund

TO: SWERB and Multi-Media Branch Attorneys
RPMs

Introduction

Section 121 (d)(2) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. Section 9601 et seq., as amended by the Superfund Amendments and Reauthorization Act of 1986, Pub. L. No. 99-499, 100 Stat. 1613 (1986) ("CERCLA", as amended) requires that, at completion, a remedial action attain a "level or standard of control" of any standard, requirement, criteria or limitation contained in "applicable or relevant and appropriate" federal environmental laws (ARARs). This requirement also applies to promulgated, more stringent State environmental and facility siting laws.

The Michigan Environmental Response Act (referred to as "MERLA," the "Act" or "Act 307") was originally enacted in 1982 and significantly amended in 1990. It is the State of Michigan's analogue to the Superfund law. Among other provisions, the Act authorizes the Michigan Department of Natural Resources (MDNR) to issue regulations related to cleanups in the State of Michigan. MDNR issued such rules effective July 11, 1990 (hereinafter the "307 Rules").

Region V has previously determined that the substantive provisions of Act 307 which are more stringent than CERCLA will constitute a potential ARAR for CERCLA remedial actions. However, now that we have greater experience in applying the provisions of Act 307 to sites within the State of Michigan over the past two years, it is appropriate to define more precisely which of the many provisions of Act 307 and the 307 Rules constitute a potential ARAR and how Region V should apply such provisions in the remedial selection process.

This memorandum will discuss the following:

I. Background and Overview of Act 307

II. Analysis of Act 307 as an ARAR and Application of Act 307 to the RI/FS and ROD process

I. Background and Overview of Act 307

With the 1990 amendments, Act 307 is a comprehensive cleanup statute similar in many ways to Superfund. It provides, for example, for:

- the identification of sites

- establishment of a fund to be used for cleanups

- administrative and judicial order authority in the case of imminent and substantial endangerment, and

- liability for recovery of costs.

Both Act 307 and the 307 Rules contain various provisions relating to cleanup decisions at hazardous waste sites. As far as Act 307 itself is concerned, Section 299.610e provides that MDNR can take or approve response activity that (1) is consistent with any rules promulgated under the act (see below), (2) assures "protection of the public health, safety, welfare or the environment" [Section 299.610e(2)(a)] and (3) attains a "degree of cleanup or control" that complies with standards of state and federal law [299.610e(2)(b)]. The statute also provides that cost effectiveness may be considered only in selecting among alternatives that meet the preceding requirements [Section 299.610e(3) and that remedial actions that permanently and significantly reduce the volume, toxicity or mobility of hazardous substances are preferred [Section 299.610e(4)].

The 307 Rules provide more detail for arriving at cleanup decisions. The 307 Rules consist of eight parts. Part 6 (Selection of Remedial Action) and Part 7 (Cleanup Criteria) outline the standards that apply to cleanup decisions in the State.

Rule 601 of Part 6 provides that all remedial actions shall be protective of "the public health, safety, and welfare and the environment and natural resources [Rule 601 (1)]; that remedial actions shall meet ARARs [Rule 601 (2)]; and that cost shall be a factor only in choosing among alternatives that meet the criteria in Part 7 of the rules [Rule 601(3)]. Rule 603 lists eleven factors to be considered in determining remedial action. These factors are very similar to the NCP's nine criteria with some

minor variations. Similar to CERCLA, Part 603 also contains a preference for treatment (Rule 603(2)) and provides that off-site remedies are not favored (Rule 603(3)).

Part 7 contains the most detailed provisions regarding the degree of cleanup at hazardous waste sites. Many of the provisions in this Part are quite detailed and cannot be summarized in this memorandum. In essence, however, it provides that any cleanup, in addition to meeting the requirements of Part 6 as discussed above, must meet entirely or in combination one of three different cleanup types (referred to as Type A, Type B and Type C). A Type A cleanup is set out in Rule 707 and basically provides a cleanup to background levels. A Type B cleanup (set forth in Rules 709 through 715)) establishes health-based cleanup standards for groundwater (Rule 709), soils (Rule 711), surface water (Rule 713) and air (Rule 715). A Type C cleanup is developed on the basis of a site-specific risk assessment, taking into account a variety of factors which are listed in the Rule (Rule 715).

II. Analysis of Act 307 as an ARAR

Pursuant to Section 121(d)(2)(A) of CERCLA, compliance with state requirements is required when 1) hazardous substances, pollutants or contaminants will remain on-site, 2) the state requirement is promulgated (i.e. of general applicability and legally enforceable (40 CFR 300.400(g)(3)), the state requirement is an environmental or facility siting law, 4) the state requirement is more stringent than any federal requirement, 5) the state requirement has been identified in a timely manner, and 6) the state requirement is legally applicable to the hazardous substance or action or is relevant and appropriate under the circumstances of the release. In addition, with respect to both State and Federal ARARs, the NCP provides that remedial actions are subject only to the substantive, not administrative, requirements of other laws. (40 CFR 300.5, 55 FR 8756, March 8, 1990). Congress required, and EPA promulgated in the NCP, a complex process for decision-making under CERCLA. As the SARA Conference Report noted, only the "substantive" standards of other laws must be attained by CERCLA actions. See H.R. Conf. Rep. No. 962 at 246 (99th Cong, 2d Sess. 1986).

While a determination of applicability or relevance and appropriateness of other environmental laws and regulations may vary from site to site, the threshold determination of whether promulgated cleanup-related provisions of Act 307 or the 307 Rules are a potential ARAR will generally depend on two factors: (1) whether the provisions are substantive or administrative requirements, and (2) whether they are more stringent than similar requirements of CERCLA or other federal environmental laws.

Act 307 and the regulations promulgated thereunder are intended to enable the State of Michigan to implement a comprehensive State cleanup program. They contain numerous technical and procedural provisions designed to establish State priorities, raise and expend monies, and authorize and direct State enforcement efforts. Consequently, many of these provisions are either not related to actual cleanup levels or standards of control or are administrative in nature.[1]

Only the following provisions of Act 307 and the Act 307 Rules are relevant to cleanup decisions and will be discussed in further detail:

* Section 299.610e (2) through (4) of the Act.

* Rules 601 and 603 of Part 6 of the 307 Rules

* Part 7 of the 307 Rules

Other provisions of Act 307 and the 307 Rules are either unrelated to remedial selection process or so administrative in nature as not to require further more detailed discussion.

Section 299.610e of the Act

The requirement in Section 299.610e(2) of the Act that remedial actions assure protection of human health and the environment and attain a degree of cleanup that complies with other applicable or relevant and appropriate standards is nearly identical to those set forth in Section 121 of CERCLA.[2] Since

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[1] Some of these administrative provisions include the requirement that a decision be made with the approval of MDNR. For CERCLA cleanup decisions, it is not necessary to obtain such approval. The approval process is not a substantive requirement of the Act or Rules. It is part of EPA's remedy selection responsibility to make the determination as to whether the provisions of the ARAR have been met. See also CERCLA Section 121(e)(1) making clear that no permits or authorizations of other federal, state or local laws are required for CERCLA response actions. See also Arkansas v. Oklahoma, -- U.S. -- (1992) (noting in the Clean Water Act context that state standards are incorporated in the federal program and therefore EPA's interpretation of those standards is entitled to deference.)

[2] Section 299.610e(2)(a) also refers to protection of public safety and welfare. These terms are not defined in NERLA. While such terms can have distinct meaning in certain contexts (such as emergency situations) depending upon the particular statutory

Section 121 (d)(2)(A)(ii) provides that only those state standards which are more stringent than a Federal standard is an ARAR for purpose of CERCLA remedial decisions, Region V believes that this requirement is not a potential ARAR. Even assuming, arguendo, that it were, Region V is herein determining that a remedial decision which is made in accordance with CERCLA and the NCP will necessarily attain this standard.

Sections 299.610e(3) and (4) require that cost effectiveness be considered by MDNR only in selecting among protective alternatives and that remedial actions that reduce the volume, toxicity or mobility of hazardous substances be preferred. These are provisions which are already contained in CERCLA as well as the NCP.[3] These provisions, then, are not more stringent than CERCLA. Moreover, these are both factors for MDNR to consider as part of the process for selecting remedial action; they do not constitute a "standard or level of control" to which a remedy must attain upon completion of the remedial action. They are, therefore, administrative requirements. Since, as mentioned earlier, only substantive standards as established by State or Federal environmental law are potential ARARs, Region V does not believe that these provisions can be considered potential ARARs. Again, however, even assuming they were, a remedial decision made in accordance with CERCLA and the NCP would satisfy these provisions.

Part 6 of the 307 Rules

The provisions contained in Rule 601 and Rule 603(2) and (3) are nearly identical to those set forth in Section 299.610e(2) through (4).[4] Therefore, for the reasons set forth

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provision, for purposes of remedial decisions in the present context, Region V will generally interpret Section 299.610e(2)(a) as intended to be coextensive with CERCLA. This is a reasonable interpretation since MERLA is patterned after CERCLA. However, the determination as to whether these terms have distinct meaning will be decided on a case-by-case basis.

[3] The requirement for cost effectiveness is contained in Section 121(a). This requirement has been codified in the NCP to mean that cost can only be considered in selecting from among protective alternatives. 40 CFR 300.430(f)(1), 55 FR 8726-8729. The preference for permanent remedies is set forth in Section 121(b) and in the NCP at 40 CFR 300.430(f)(1)(ii)(E).

[4] Rule 603(3) adds one additional factor. It provides that the off-site transportation of contaminated waste is the least favored remedial decision. Again, this is provision already contained in CERCLA (Section 121(b)) and the NCP (40 CFR 300.430(f)(1)(ii)(E)). While this provision is not actually set

above, Region V does not consider these provisions to be potential ARARs, but even if they were, a remedial decision which is made in accordance with CERCLA and the NCP would satisfy these provisions.

Rule 603(1) sets forth eleven criteria to consider in assessing remedial action alternatives. These criteria are similar, although not identical to the nine criteria which form the basis for remedial decisions under the NCP (40 CFR)300.430). Under Section 121(d)(2)(A) a remedial decision must attain the "standard or level of control" set forth in an ARAR at completion of the remedial action. The requirement of Rule 603(1) to consider various factors does not constitute a "standard or level of control," nor is it a standard whose attainment can be measured at completion. Instead, it is an administrative or procedural provision which is intended to be followed during the process of reaching a decision. However, as discussed earlier, administrative provisions of Federal or State statues are not considered potential ARARs. Therefore, the requirements of Rule 603 to consider certain factors as part of a state decisionmaking process would not be considered a potential ARAR for purposes of a remedial decision.

Moreover, the criteria set forth in Rule 603(1) are similar to, or encompassed within, the nine criteria set forth in the NCP which are required to be considered by EPA in the remedial selection process. 40 CFR 430(e)(9). To the extent that the criteria in Rule 603(1) are phrased in a manner different from the nine criteria in the NCP, Region V has determined that the differences are not material.[5] The essence of each of the factors set forth in Rule 603(1) are encompassed within the nine

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forth in Section 299.610e, it is, like 299.610e(2) and (3), an administrative provision which provides direction to MDNR, but does not constitute a "level or standard of control" to be attained at completion within the meaning of the statute. Therefore, the same rationale applies for not considering this provision an ARAR. In any event, here too, compliance with CERCLA would result in satisfying this provision.

[5] One difference from the nine criteria is that Rule 603 specifically directs MDNR to consider the goals of the Michigan Solid Waste Management Act and the Michigan Hazardous Waste Management Act. However, CERCLA and the NCP already require a remedial decision to comply with ARARs and therefore the requirements of these state laws will necessarily be considered. Similarly, the requirement to consider the threats associated with excavation, transportation and redisposal or containment of waste are subsumed within the requirement to consider the long and short term effects of remedial decisions. 40 CFR 300.430(e)(9).

criteria. Therefore the provisions of Rule 603(1) are not considered more stringent than CERCLA.[6]

Finally, even assuming, arguendo, that the provisions of Rule 603(1) were considered a potential ARAR, Region V is herein determining that a remedial decision which is made in accordance with CERCLA and the NCP will necessarily attain the standards contained in those provisions.

Part 7 of the 307 Rules

Rule 705(2) and (3)[7] require that all remedial actions shall attain the degree of cleanup for a Type A, B or C remedy or a combination thereof. Region V considers the requirement to select a Type A, Type B or Type C cleanup to be a substantive requirement which constitutes an ARAR within the meaning of Section 121(d)(2)(A), although Rule 705(4) which requires MDNR approval of the cleanup plan is considered an administrative requirement which does not constitute a potential ARAR and is not required.

Compliance with the 307 Rules requires a demonstration in the Record of Decision and the Administrative Record that the selected remedy satisfies the criteria for a Type A, B or C cleanup for each component of the remedy. Each media will be analyzed separately. Therefore, a remedy may satisfy the requirements of Act 307 and the 307 Rules by showing, for example, that it meets the criteria for a Type B cleanup for groundwater and a Type C cleanup for soils. This combination is specifically countenanced by Rule 705(4).

To demonstrate compliance with a Type A or Type B cleanup, the Record of Decision must reflect that the standards of Rule 707 (Type A) or Rules 709 through 715 and Rule 723 (Type B) will be met. As a general rule, these provisions will result in numerical cleanup levels. Please note that it is not necessary to rely on the State to provide these calculations although it is advisable to consult with the State to ensure accuracy. While the Type A and Type B rules are relatively straightforward in most respects, there are undoubtedly provisions which require

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[6] Where narrative, non-numerical standards are ARARs, EPA has considerable discretion in interpreting the standard. 55 FR 8746 (March 8, 1990).

[7] Rule 705(1) simply requires that remedial action be protective of the public health, safety and welfare and the environment and natural resources. For reasons discussed earlier, even if this were considered a potential ARAR, a remedy which is selected in accordance with CERCLA and the NCP will satisfy this requirement.

interpretation. These provisions may require further Regional interpretation. The Region will consider MDNR's views on such matters. However, EPA is ultimately responsible for determining whether the standards in the 307 Rules have been met.

Unlike Type A and B cleanups which generally yield numerical cleanup levels, Type C cleanups can consist of remedies approved by MDNR which have been developed on the basis of a site-specific risk assessment taking into account certain factors.[8] Rule 717(2). In order to demonstrate compliance with a Type C remedy, it is necessary to show that the remedial decision was based on a site-specific risk assessment. This will, of course, almost always be the case with remedial decisions selected under CERCLA.

Rule 717 also requires that certain information be developed and considered in connection with a Type C cleanup "as appropriate to the site in question." For reasons set forth above, Region V has determined that such "considerations" are administrative provisions, not substantive standards under Section 121(d)(2)(A). These factors are required to be considered by MDNR, but do not establish a "standard or level of control" such as to constitute a potential ARAR.

Even assuming that the considerations set forth in Rule 717 were to constitute potential ARARs, Region V has carefully compared the factors set forth in Rule 717 with the information which is considered by EPA in conducting a Remedial Investigation/Feasibility Study (RI/FS). Attached hereto is a document comparing each of these requirements in detail. Based upon this review, it is clear that EPA, through the CERCLA process, considers, as appropriate, each of the factors which are specified in Rule 717. Therefore, even if the considerations in Rule 717 are considered ARARs, Region V herein determines that a RI/FS conducted and approved in accordance with the NCP and applicable EPA guidance will satisfy the provisions of Rule 717.[9]

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[8] As stated above, the requirement of MDNR approval as outlined in Rule 717(1) is considered administrative and not substantive.

[9] Rule 717 also requires that any remedial action which addresses a genotoxic teratogen or a germ line mutagen (Rule 717(4)) or which addresses surface water or sediments (Rule 717(5)) must include cleanup criteria established by MDNR. In the case of cleanup criteria for surface water or sediments certain listed factors should be considered by MDNR in making this determination. These provisions are administrative since there are no cleanup criteria established. They would not, therefore, be considered a potential ARAR.

There are certain additional requirements which are applicable to Type C cleanups. Region V believes that the requirement contained in Rule 719(1) which requires provisions for long-term monitoring for remedial actions which involve the on-site containment of hazardous waste is a substantive requirement. However, the remainder of this rule, which deals primarily with the necessity of certain provisions in agreements with responsible parties and with the nature of certain deed and land use restrictions, are considered administrative. The same is true of Rule 727 which specifies certain requirements for the conduct of risk assessments.

Conclusion

In implementing CERCLA, EPA is required to select remedies which attain a level or standard of control which attains promulgated, more stringent State laws and regulations where such laws or regulations are applicable or relevant and appropriate to a release. It is EPA's responsibility to determine whether a state law is an ARAR and whether the remedial decision will attain such ARAR.

MERLA is a comprehensive hazardous waste cleanup statute for sites within the State of Michigan. Like CERCLA, after which it was patterned, the statute provides guidance and discretion to State decision makers in making remedial decisions. MERLA requires that remedial decisions in the State of Michigan meet the requirements of a Type A, Type B or Type C remedy as set forth in Part 7 of the 307 Rules. Region V considers this to be an ARAR for purposes of CERCLA. However, to the extent that the provisions of Act 307 or the 307 Rules base a remedial decision on consideration of various factors (such as those set forth for selection of a Type C cleanup), these factors are considered "administrative" and not substantive requirements. They are not considered ARARs under CERCLA. Moreover, as discussed above, even if the factors set forth in MERLA were substantive, they are so similar to those already required to be considered by EPA under CERCLA that they are not more stringent than CERCLA requirements. Consequently, Region V will continue to ensure that remedial decision attain a Type A, Type B or Type C cleanup. However, it will be EPA's determination as to whether the applicable requirements have been met. In the case of a Type C remedy, the factors set forth in the 307 Rules will be deemed to have been met by compliance with the NCP.

This memorandum should be placed in the administrative record to document Region V's interpretation as to the relationship between MERLA and CERCLA.

ATTACHMENT

The following requirements of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), the National Contingency Plan (NCP) and U.S. EPA guidance and directives are analagous to the following provisions of Rule 717:

Rule 717(2): "Type C criteria shall be developed on the basis of a site-specific risk assessment, taking into account the following factors:

(a) The party who proposes the type C remedial action shall demonstrate that the proposed criteria are appropriate for the site being considered."

40 CFR 300.430(d)(4) provides "Using the data developed under paragraphs (d)(1) and (2) of this section, the lead agency shall conduct a site-specific baseline risk assessment to characterize the current and potential threats to human health and the environment that may be posed by contaminants....The results of the baseline risk assessment will help establish acceptable exposure levels for use in developing remedial alternatives in the FS...."

"(b) Type C criteria shall take into account reasonably foreseeable future uses of the site and natural resources in question."

40 CFR 300.430(d)(4) requires the lead agency to conduct a site specific baseline risk assessment to "help establish acceptable exposure levels...." The preamble to the NCP states "[i]n the Superfund program, the exposure assessment involves developing reasonable maximum estimates of exposure for both current land use conditions and potential future land use conditions at each site." 55 Fed. Reg. 8710, No. 46 (March 8, 1990)

"(c) Type C remedial actions shall take into account cost effectiveness."

Section 121(a) of CERCLA requires the President to "select appropriate remedial actions..,which provide for cost-effective response." See also 40 CFR 300.430(f)(1)(i)(D).

Rule 717(3): "The party who proposes a type C remedial action shall provide information about, and the department shall consider, all of the following factors as appropriate to the site in question:

(a) Potential exposure of human and natural resource targets."

40 CFR 300.430(d)(4) requires that "the lead agency shall conduct a site-specific baseline risk assessment to characterize the current and potential threats to human health and the environment....[t]he results of the baseline risk assessment will help establish acceptable exposure levels for use in developing remedial alternatives...." Section 3.2.2.7 of "Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA" (Interim Final, OSWER Directive 9355.3-01) ("RI/FS Guidance") discusses requirements for collecting data on human populations and land use. Section 3.2.2.8 of the RI/FS Guidance discusses Ecological Investigations.

"(b) Environmental media affected by contamination."

40 CFR 300.430(d)(2)(ii) requires the lead agency to conduct a field investigation to assess "[c]haracteristics or classifications of air, surface water, and ground water." See also part 3.2.2 of the RI/FS Guidance ("Investigate Site Physical Characteristics").

"(c) All of the following with respect to the physical setting of the site:

(i) Geology."

40 CFR 300.430(d)(2)(i) requires the lead agency to conduct a field investigation to assess "[p]hysical characteristics of the site, including...geology...." See also section 3.2.2.2 of the RI/FS Guidance ("Geology").

"(ii) Hydrology."

Section 3.2.2.4 of the RI/FS Guidance, "Surface-Water Hydrology," discusses information to be considered in assessing site hydrology. See also 40 CFR 300.430(d)(2)(i).

"(iii) Soils."

40 CFR 300.430(d)(2)(i) requires the lead agency to conduct a field investigation to assess "[p]hysical characteristics of the site, including...soils...." See also section 3.2.2.3 of the RI/FS Guidance ("Soils and the Vadose Zone").

"(iv) Hydrogeology."

40 CFR 300.430(d)(2)(i) requires the lead agency to conduct a field investigation to assess "[p]hysical characteristics of

the site, including...hydrogeology...." See also section 3.2.2.5 of the RI/FS Guidance ("Hydrogeology").

"(v) Other aspects of the physical setting which have a bearing on the appropriateness of the proposed plan."

40 CFR 300.430(d)(2)(vii) requires the lead agency to conduct a field investigation to assess "[o]ther factors...that pertain to the characterization of the site or support the analysis of potential remedial alternatives." Section 3.2.2 of the RI/FS Guidance provides that "[d]ata on the physical characteristics of the site and surrounding areas should be collected to the extent necessary to define potential transport pathways and engineering data for development and screening of remedial action alternatives...."

"(d) Background groundwater, surface water, and air quality at the site."

40 CFR 300.430(d)(2)(ii) requires the lead agency to conduct a field investigation to assess "[c]haracteristics or classifications of air, surface water, and ground water." Section 3.2.4.1 of the RI/FS Guidance provides that "because of the uncertainties associated with...identifying background levels,...sampling should also be conducted in the area perceived to be upgradient from the contaminant source." Section 3.2.4.3 of the RI/FS Guidance provides that "[s]urface-water sampling locations should be chosen at the perceived location(s) of contaminant entry to the surface water and downstream, as far as necessary, to document the extent of contamination." Section 3.2.4.5 of the RI/FS Guidance discusses initiation of a field-screening program to determine if air pollution is a problem at the site.

"(e) Current and reasonably foreseeable natural resource use."

Section 3.2.2.8 of the RI/FS Guidance ("Ecological Investigations") provides that "[b]iological and ecological information collected for use in the baseline risk assessment aids in the evaluation of impacts to the environment and also helps to identify potential effects with regard to the implementation of remedial actions. The information should include a general identification of the flora and fauna associated in and around the site with particular emphasis placed on identifying sensitive environments...." Table 3-9 of the RI/FS Guidance discusses information needed for an environmental evaluation of the site.

"(f) Potential pathways of hazardous substance migration."

40 CFR 300.430(d)(2)(v) and (vi) require the lead agency to conduct a field investigation to assess "[a]ctual and potential exposure pathways through environmental media [and] [a]ctual and potential exposure routes...." See also part 3.4.2 of the RI/FS Guidance ("Baseline Risk Assessment").

"(g) All of the following with respect to hazardous substances at the site:

(i) Amount."

40 CFR 300.430(d)(2)(iii) requires the lead agency to conduct a field investigation to assess "[t]he general characteristics of the waste, including quantities...."

"(ii) Concentration."

40 CFR 300.430(d)(2)(iii) requires the lead agency to conduct a field investigation to assess "[t]he general characteristics of the waste, including...concentration...."

"(iii) Form."

40 CFR 300.430(d)(2)(iii) requires the lead agency to conduct a field investigation to assess "[t]he general characteristics of the waste, including...state...."

"(iv) Mobility."

40 CFR 300.430(d)(2)(iii) requires the lead agency to conduct a field investigation to assess "[t]he general characteristics of the waste, including...mobility."

"(v) Persistence."

40 CFR 300.430(d)(2)(iii) requires the lead agency to conduct a field investigation to assess "[t]he general characteristics of the waste, including...persistence...."

"(vi) Bioaccumulative properties."

40 CFR 300.430(d)(2)(iii) requires the lead agency to conduct a field investigaiton to assess "[t]he general characteristics of the waste, including...propensity to bioaccumulate...."

"(vii) Environmental fate."

Section 3.4 of the RI/FS Guidance states that "[a]nalyses of the data collected should focus on the development or refinement of the conceptual site model by presenting and analysing data on source characteristics, the nature and extent of contamination,

the contaminated transport pathways and fate, and the effects on human health and the environment." Section 3.4.1.4 of the RI/FS Guidance, "Contaminant Fate and Transport" discusses methods of assessing contaminant fate and transport.

"(viii) Other characteristics of the hazardous substances which have a bearing on the appropriateness of the proposed plan."

40 CFR 300.430(d)(2)(vi) requires the lead agency to conduct a field investigation to assess "[o]ther factors, such as sensitive populations, that pertain to the characterization of the site or support the analysis of potential remedial action alternatives."

"(h) The extent to which the hazardous substances have migrated or are expected to migrate from the area of release."

40 CFR 300.430(d)(2) provides that "[t]he lead agency shall characterize the nature of and threat posed by the hazardous substances and hazardous materials and gather data necessary to assess the extent to which the release poses a threat to human health or the environment...." See also section 3.2.4 of the RI/FS Guidance ("Determine the Nature and Extent of Contamination").

"(i) The impact of future migration of the hazardous substances."

The NCP requires the lead agency to "conduct a site-specific baseline risk assessment to characterize the current and potential threats to human health and the environment that may be posed by contaminants migrating to ground water or surface water, releasing to air, leaching through soil, remaining in the soil, and bioaccumulating in the food chain." 40 CFR 300.430(d)(4) See also Part 3.4.2 of the RI/FS Guidance.

"(j) Current or potential contribution of the hazardous substances to food chain contamination."

The NCP requires the lead agency to "conduct a site-specific baseline risk assessment to characterize the current and potential threats to human health and the environment that may be posed by contaminants...bioaccumulating in the food chain." 40 CFR 300.430(d)(4)

"(k) Climate."

40 CFR 300.430(d)(2)(i) requires the lead agency to conduct a field investigation to assess "[p]hysical characteristics of the site, including...meteorology...." See also section 3.2.2.6

of the RI/FS Guidance ("Meteorology") and Table 3-8 of the RI/FS Guidance ("Summary of Atmospheric Information").

"(l) The technical feasibility and cost-effectiveness of remedial action alternatives, including alternatives which comply with type B criteria."

The NCP provides that effectiveness, implementability (i.e., technical feasibility) and cost are the three criteria to be used to guide the development and screening of remedial alternatives in the Feasibility Study. 40 CFR 300.430(e)(7) As part of the remedy selection process, the nine criteria are analyzed for each alternative under consideration; implementability (including technical feasibility) and cost are two of the nine criteria evaluated in the Feasibility Study, 40 CFR 300.430(e)(9)(F) and (G). Implementability and cost are two of the five primary balancing criteria considered in the selection of a remedy under the process set forth at 40 CFR 300.430(f).

"(m) The evaluation of remedial action alternatives required by the provisions of R 299.5603."

R 299.5603 sets forth the requirements to be considered in evaluating remedial action alternatives. These requirements correspond to the nine criteria set forth in the NCP at 40 CFR 300.430(f).

"(n) The uncertainties of the risk assessment."

The NCP provides that "[r]emediation goals shall establish acceptable exposure levels that are protective of human health and the environment and shall be developed by considering the following: (A) Applicable or relevant and appropriate requirements...and...(4) Factors related to uncertainty; and (5) Other pertinent information." 40 CFR 300.430(e)(2)(i).

"(o) The ability to monitor remedial performance, including the limitations of analytical methods."

The analysis of the nine criteria set forth in the NCP requires consideration of the implementability of a remedy, including "the ability to monitor the effectiveness of the remedy." 40 CFR 300.430(e)(9)(iii)(F)(1). The NCP also provides that "technical limitations such as detection/quantification limits for contaminants" are to be considered in determining remediation goals. 40 CFR 300,430(e)(2)(i)(A)(3).

"(p) For remedial action plans which may impact the Great Lakes, consistency with the Great Lakes Water Quality Agreement of 1978, as amended by protocol signed November 18, 1987, and the Great Lakes toxic substances control agreement of 1986."

U.S. EPA's "CERCLA Compliance With Other Laws Manual: Interim Final" (EPA 540/G-89-006, August 1988) provides on page 3-1 that "[s]ection 118(a)(2) of the [Clean Water Act] as amended by the Water Quality Act of 1987 specifically requires EPA to "...take the lead in the effort to meet..." the goals embodied in the Great Lakes Water Quality Agreement (GLWQA) with particular emphasis on goals related to toxic pollutants. The provisions of the GLWQA will be very pertinent to sites having discharges to the Great Lakes drainage basin."

"(q) Other factors appropriate to the site. Department requests for information pursuant to this subdivision shall be limited to factors not adequately addressed by information required by the provisions of other subdivisions of this rule and shall be accompanied by an explanation of the need for such additional information."

The NCP provides that the lead agency shall establish remediation goals that are protective of human health and the environment by considering ARARs, acceptable exposure levels for systemic toxicants and known or suspected carcinogens, factors related to technical limitations and uncertainty, and "other pertinent factors." 40 CFR 300.430(e)(2)(A).

Rule 717(5) "Any remedial action plan to address surface water or sediments shall include cleanup criteria established by the department on the basis of sound scientific principles considering the need to eliminate or mitigate the following use impairments, as appropriate to the site in question:

(a) Restrictions on fish or wildlife consumption.
(b) Degraded fish or wildlife populations.
(c) Fish tumors or other deformities.
(d) Bird or animal deformities or reproductive problems.
(e) Degradation of benthos.
(f) Restrictions on dredging activities.
(g) Eutrophication or undesirable algae.
(h) Restrictions on drinking water consumption or taste or odor problems.
(i) Beach closings.
(j) Degradation of aesthetics.
(k) Degradation of phytoplankton or zooplankton populations.
(l) Loss of fish or wildlife habitat."

Section 121(d)((2)(B)(i) of CERCLA discusses factors to be considered in determining whether water quality criteria under the Clean Water Act are ARARs for a site. The "CERCLA Compliance With Other Laws Manual: Interim Final" (EPA 540/G-89-006, August 1988) discusses the relevance and appropriateness of water quality criteria for remedial actions involving surface waters and provides on page 3-10 that "water quality criteria for

protection of aquatic life may be relevant and appropriate for a remedy involving surface water...when the designated use requires protection of aquatic life or when environmental concerns exist at the site." The factors for states to consider in determining water quality criteria include "the kind and extent of all identifiable effects on health and welfare including, but not limited to, plankton, fish, shellfish, wildlife, plant life, shorelines, beaches, esthetics, and recreation which may be expected from the presence of pollutants in any body of water, including ground water; (B) on the concentration and dispersal of pollutants, or their byproducts, through biological, physical, and chemical processes; and (C) on the effects of pollutants on biological community diversity, productivity, and stability, including information on the factors affecting rates of eutrophication and rates of organic and inorganic sedimentation for varying types of receiving waters."