Commonwealth of Massachusetts
Executive Office of Environmental Affairs
Department of Environmental Protection

William F. Weld
Governor
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Commissioner

MEMORANDUM

TO : Waste Site Cleanup Program Advisory Committee and Interested Parties

THRU: James C. Colman, Assistant Commissioner

FROM: Richard Chalpin, Program Redesign Coordinator RC (RC)

DATE: January 27, 1992

SUBJ: Proposed Tier Classification and Site Categorization Processes

Enclosed please find a package of material concerning Tier Classification and Site Categorization for your review and comment. This package, which will be discussed at the February 13, 1992 Advisory Committee meeting, includes the following four papers:

Tier Classification Proposal and Discussion Document,

Proposed Numerical Ranking System Issues Presentation and Discussion,

Introduction to the Proposed Numerical Scoring System for Tier Classification, and,

Site Categorization Proposal.

At the Advisory Committee meeting on February 13, we will provide an overview of these proposals and discuss them with the Committee. We will continue to accept comments and additional questions through March 2th. Please direct comments to:

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The attached Tier Classification proposal includes a number of specific concepts which may need to be refined, such as the proposal for a numerical site ranking process. At the Advisory Committee meeting on February 13, we would like to discuss setting up an ad hoc workgroup to assist the Department in refining these proposals.

I'm looking forward to discussing the Tier Classification proposal with you at the February Advisory Committee.

PROPOSED REVISION TO THE MASSACHUSETTS CONTINGENCY PLAN

SUBPARTS C AND E: TIER CLASSIFICATION

TIER CLASSIFICATION PROPOSAL AND DISCUSSION DOCUMENT

JANUARY, 27, 1992

This document presents a proposal for classifying 21E disposal sites into two tiers. The "Tier Classification" concept was proposed in the Department's report to the Legislature of November 30, 1990, titled "Interim Report: Waste Site Cleanup Program Improvements and Funding Recommendation", (the "Interim Report"). The Interim Report was prepared jointly by the Bureau of Waste Site Cleanup and the Study Committee for Waste Site Cleanup Program Improvements and Long Term Funding (the "Study Committee").

Tier Classification would be used to determine whether or not 21E response actions at Subpart E disposal sites proposed by Potentially Responsible Parties (PRPs) require DEP oversight. It would also be used by DEP staff to determine priorities for permit calls, state funded response actions, or enforcement.

The Interim Report recommended that DEP establish a two-tier classification system to separate Tier I sites which need some level of DEP oversight due to the complexity and risks they pose from Tier II sites which do not require DEP oversight except by audit. For Tier I sites, the number of DEP approvals required for most sites would be reduced from the current six to one as a result of a new 21E permit program. Assessment and cleanup of Tier II sites would require no upfront BWSC approval or 21E permit. However, other appropriate DEP or state and local permits would still be required for certain site response actions. (BWSC is initiating a study pursuant to the proposed 21E amendments which will address coordinating DEP and other state and local permitting of 21E response actions.)

This proposal has been developed by BWSC's internal Tier Classification Workgroup (the "Workgroup"). The proposal and recommendations provided are intended to promote discussion and focus comments from reviewers. The recommendations presented in this document are those of the Workgroup and are not necessarily the final recommendations of the Bureau of Waste Site Cleanup (BWSC) or the Department.

Introduction:

In order to introduce this proposal, it is appropriate to review some of the elements of the December 26, 1991, document titled, "Subpart C: Proposed Notification Regulations" which have already been presented to the Waste Site Cleanup Program Advisory Committee (the "Advisory Committee"). In addition, the Site Categorization paper provided in this package provides important new information pertinent to this Tier Classification proposal.

MCP Format:

This proposal refers to the various "subparts" of the MCP. This distinction probably has little meaning to readers who are not familiar with the MCP. However, it is important since certain subparts refer to different types of "response actions" that may be taken at 21E "sites".

The Workgroup's proposed MCP revisions are as follows:

1. Subpart C, "Notification Regulations for Releases of Oil and Hazardous Materials", would be revised to include the "release" reporting regulations for "historical releases" and a "Site Categorization" process. Presently, Subpart C only includes reporting requirements for "sudden" releases.

2. The Subpart C Site Categorization process would provide a mechanism for certain sudden and historical releases to be directed to either the full multi-phase "Subpart E site assessment process" or a new "Subpart D alternative response action process".

3. Subpart D is now "reserved". New regulations would be developed for alternative response actions for some sudden releases and some historical releases. Subpart D would contain specific guidance and requirements for response actions where a Subpart E response would not be necessary due to the limited nature and/or extent of a release. Examples of potential Subpart D categories are "removal actions", lead sites, and construction sites.

4. Subpart E would include any revisions to today's multiphase site assessment and remediation process which result from the program redesign for sudden or historical releases that are categorized as "disposal sites" .

Program Redesign Process to Date:

The proposed process which leads to Tier Classification is as follows. Specific details on each part of the process are provided later in the package of documents you have for review:

1. Release Notification: PRPs must notify DEP of both sudden and historical releases. For historical releases, or any sudden release that cannot be completely cleaned up within 120 days of reporting, PRPs must include in their notification whether the release is in a mapped "Critical Resource Area" or "CRA". (Please take note that an important wording change has been made since the Notification Regulation proposal was sent to the Advisory Committee on December 26th. The Workgroup found that the term "environmentally sensitive area" triggered a considerable amount of internal comment and confusion because of its broad meaning. Therefore, in order to make the terminology better reflect the intent of the Tier I mapping proposal, the term "ESA" has been dropped in favor of "critical resource area" or "CRA". This term will be used throughout this Tier Classification proposal.)

2. PRPs must determine via the Site Categorization step whether or not a release is a "disposal site" subject to the MCP Subpart E process. *Subpart E disposal sites in CRAs would automatically be classified Tier I sites.*

3. *Subpart E disposal sites which are not in mapped CRAs would be classified by the proposed Subpart E numerical site ranking process* described in this proposal. The Subpart E scoring system would address many other site specific factors, exposure pathways, and sensitive environmental criteria which are not readily addressed by geographic mapping of CRAs.

4. The Bureau would track those releases where notification shows that they are in CRAs to monitor their progress after initial notification, i.e., has the site been categorized?, has an IM been proposed?, or has a permit application been filed within the allowable time frame? If it appears that a release in a CRA is not moving through the process in the required timeframes, DEP could target sites for permit calls, auditing, or enforcement.

5. While Subpart E disposal sites located in a CRA would be classified prior to completion of the numerical site ranking, completion of the score sheet would be required for permitting and for DEP auditing purposes. As with all other sites, the score sheet would have to be submitted within one year of site notification.

6. The Workgroup has not developed a specific recommendation for the review and approval process for Subpart D sites. This will be developed once the final comments on the Site Categorization concept are received.

Ad Hoc Subcommittee Assistance:

In developing this proposal, the Workgroup has evaluated several existing site prioritization methods from several states and EPA. All of the systems reviewed are used by regulatory agencies for internal agency priority setting. None of the systems are used by private or independent parties such as LSPs to make recommendations to regulatory agencies about the need for agency involvement in response actions. In light of this and the fact that BWSC is proposing a "new" scoring system, the Bureau is requesting that an *Ad Hoc Subcommittee of the Advisory Committee* be appointed to assist the Workgroup in developing a final site ranking approach.

The Workgroup feels the assistance and advice of an Ad Hoc Subcommittee will help expedite the development of a final ranking system. The site ranking proposal provided here is the Workgroup's initial attempt at such a system. It is intended to reflect the areas that the Workgroup feels should be scored and how the scoring should take place.

Background:

As mentioned, Tier Classification was one of the key recommendations in the Interim Report. The following excerpts describe what the Study Committee had in mind:

> The Department of Environmental Protection should:
>
> > Emphasize the clear responsibility of the private sector to report all known disposal sites and for the DEP to seek and identify the highest priority sites.
> >
> > Encourage private sector responses to the maximum extent possible by establishing clear responsibility and incentives to conduct assessments in a timely manner. This would be accomplished with several program changes including:
> >
> > > Establishing a two-tier notification system which separates Tier I sites which need some level of DEP oversight (due to their complexity and risks posed) from Tier II sites which do not need any DEP oversight except by audit. For Tier I sites, the number of DEP approvals required would be reduced from the current six to one. Assessment and cleanup of Tier II sites would require no upfront DEP approval.
> > >
> > > Establishing a permit process for Tier I sites that would allow response action to proceed.
> > >
> > > For Tier II sites, requiring only notification to the Department before response action can proceed.

The Interim Report also included direction and guidance on how the Tier Classification process should address the need for performing Short Term Measures in response to imminent hazards, "prudent to

do" Interim Measures, and criteria for making permit calls. The following are excerpts from the Interim Report:

> STM's and IM's: The new model incorporates the two types of initial actions used in the current program: short term measures which deal with imminent hazards at sites, and interim measures (which may be part of larger remedial responses) that are economically prudent to perform quickly to reduce risks posed by a site.
>
> DEP will review notification of Tier I sites and accompanying information to determine whether the site presents an imminent hazard to health and/or the environment. The initial report submitted by the PRP should inform DEP of any imminent hazards at the site, and should recommend any short term measure(s) needed to stabilize the situation, as well as any interim measures contemplated for the site. Any site which poses an imminent hazard to health and/or the environment would be considered to be a Tier I site; if the imminent hazard is the only reason that a site is in Tier I, then it would be placed in Tier II upon completion of a short term measure.
>
> DEP's review of Tier I site information will identify (or confirm) conditions which pose an imminent hazard.
>
> At a Tier II site, where a licensed site manager oversees all response action, the interim measure can be planned and implemented by the licensed site manager, without additional review by DEP.
>
> At Tier I sites, a PRP wishing to implement an interim measure before a permit decision is made can propose action to DEP. DEP will review the proposal and respond with any comments in 14 days. If DEP does not respond within this period, the PRP can proceed without waiting to hear from DEP. If a PRP wants to take such measures after DEP has granted a Category B or C response action permit at a Tier I site, the interim measure can be planned and overseen by the licensed site manager, without additional review by DEP.
>
> Permit calls: DEP will review all Tier I sites identified and evaluate them on the basis of their risks to health, safety, public welfare, and the environment. For sites posing the highest risks, DEP will identify potentially responsible parties, and inform the PRP(s) that they must submit a permit application within 120 days.

Tier Classification Assumptions:

The Workgroup has attempted to develop a proposal that appropriately reflects DEP's responsibility to oversee sites that pose the most serious threats to public health and the environment while maintaining the fundamental privatization goals and recommendations of the Study Committee. However, the Interim Report's focus was on the overall structure of a redesigned 21E program and funding. It did not address many specific implementation or operational details that would be necessary to carry out the program redesign. As a result, the Workgroup has made a number of assumptions in developing this proposal based on the recommendations of the Study Committee which should be listed for review and comment. Many of these assumptions involve the checks

and balances that would be necessary in other areas of the redesigned 21E program to make this Tier Classification proposal work effectively.

The following is a summary of some of the key assumptions upon which this proposal is based. These assumptions are drawn from the guidance provided in the Interim Report and the scope of work for the Tier Classification project titled, "Draft Scopes of Work for 21E Program Redesign", which was provided to the Advisory Committee in September, 1991. The key assumptions are:

1. In order to maximize consistency in decision making, the Tier Classification process must be as straight forward and as simple as possible since it will be used by a wide range of private sector professionals as well as by DEP staff.

2. It must provide the regulated community with the highest possible level of predictability and certainty about whether a site will require 21E permitting as early as possible in the process.

3. The Classification method must quantify/compare site information relatively easily.

4. It must provide enough information at Tier Classification to allow DEP to determine and/or confirm whether or not an imminent hazard exists at a site. (Please note that imminent hazard identification can occur at any point in time. The Interim Report specifically mentioned that Tier Classification should include a "formal" statement about imminent hazards at sites.)

5. The process must be flexible enough to provide opportunities for PRPs to initiate prompt initial response actions at Tier I sites (e.g., STMs or Ims) to reduce the threats posed by a site, prevent contaminant migration, and reduce long term cleanup costs.

6. The Critical Resource Area mapping and the numerical scoring system must focus on those health and environmental exposure scenarios that typify releases or response actions that DEP would want to oversee.

7. The scoring method must provide specific numerical cutoff points for Tiers I and II. In addition, the scoring range must be broad enough to allow LSPs to make a permit category recommendation (A, B, or C) based on a site's score, and for DEP to use a site's score to help target sites for permit calls and/or to determine whether or not to intervene with State funds when PRPs are either unwilling or unable to perform response actions.

8. The regulations must be accompanied by a detailed scoring system guidance document for distribution to the private sector. DEP must also hold intensive training sessions for LSPs and DEP staff regarding site scoring, and,

9. The Tier Classification process, scoring system and methods should be reevaluated annually and updated as needed to ensure their effectiveness.

It is also important to reemphasize that Tier Classification determines the level of DEP *oversight* a site receives. A Tier II site may pose "significant risk", therefore it must be thoroughly investigated pursuant to the MCP. Tier II sites would still need to be cleaned up so that significant risk is eliminated and a permanent solution is achieved.

Tier Classification Proposal:

The following section contains a detailed description of this proposal and includes:

1) Additional discussion about the Notification Regulation proposal to use Critical Resource Area mapping as a way to determine a site's Tier Classification at "release" notification,

2) A discussion of how the Workgroup developed the proposed numerical site scoring *method and process;* (a specific example of a scoring process is attached), and,

3) A discussion about some of the recommendations the Workgroup has made about how Tier Classification could be effectively implemented. Specifically, this section includes a discussion of:

a) the *level of effort* necessary to classify sites,

b) a proposal for *reclassifying* sites based upon new information, and,

c) a discussion of the "*opportunities*" or *incentives* the proposal offers to PRPs.

Subpart C Critical Resource Area Mapping and Tier Classification.

The following section provides additional information about the CRA mapping concept that was proposed in the 12/26/91 Release Notification proposal sent to the Advisory Committee.

The specific Subpart C mapping proposal is based on a recommendation made by the Study Committee. In the Interim Report, the Study Committee recommended that Tier Classification should be based on geographic mapping of areas that present a high risk of exposure. Specifically, section 3.1 states:

> "To define Tier I sites, DEP will identify geographic areas and types of sites which require some agency involvement to ensure protection of health, safety, welfare, and the environment. Tier I sites would be located in areas which present high risk of exposure to contaminants (e.g. schools, playgrounds, residential areas), or in environmentally critical areas (e.g., Zone IIs for public water supplies, areas with drinking water supplied by private wells.) DEP will classify all other areas as Tier II sites, which present less risk of exposure than Tier I sites, and are not located in environmentally critical areas."

The Interim Report did not include much more detail about how to develop and implement a classification process based on mapping. In discussing the mapping concept, the Workgroup quickly realized that this approach had some practical limitations since certain environmental media or exposure pathways could not readily be mapped (i.e., soil or air contamination). In addition, mapping has potential drawbacks if taken too far. For example, a major problem with the original term "environmentally sensitive area" is that it may cover a number of sensitive locations including Zone II's, ACECs, vernal pools, coastal banks, and 100 year floodplains of surface water supplies. On one hand, the Workgroup wants to make the Tier Classification process as simple and straightforward as possible. Automatic Tier I classification for disposal sites in mapped areas is one way to do that. On the other hand, the Workgroup does not want to make hundreds of sites across the state Tier I's solely due to their location, when site specific factors, if scored in a ranking system, would clearly make them Tier IIs. The Workgroup feels that extensive mapping of sensitive areas could inappropriately classify hundreds of sites as Tier I's subject to permitting. This result would be contrary to the goals of the program redesign which calls upon the Department to focus its limited resources on the worst sites while depending on the private sector, assisted by LSPs, to oversee all others with DEP auditing compliance.

In light of these limitations, the Workgroup is proposing that Tier I mapping to be limited to geographic areas where the Department would *always want to review site conditions or 21E response action proposals to ensure that health, safety, welfare and the environment are not at risk, regardless of site specific factors.*

Using this criterion, the Workgroup is proposing that mapping for the purposes of Tier Classification be limited to public water supply systems served by *groundwater and/or designated sole source aquifers.* The specific proposal is that all 21E "*disposal sites*" in mapped CRAs where a reporting threshold for groundwater is

exceeded, would automatically be classified as Tier I sites. (See Site Categorization paper for more discussion of the "disposal site" distinction.)

Sites in mapped CRAs which exceed a reporting threshold for *soil and not for groundwater would not automatically be Tier I's.* These sites would be ranked using the proposed scoring system after completion of a Phase I equivalent level of site investigation. Tier Classification in such cases could occur up to one year after release notification. The Workgroup feels that the proposed numerical ranking system will adequately address sites where only soil reporting thresholds are exceeded or those located in any other sensitive environmental areas not categorically designated and mapped as CRAs. The scoring system will evaluate many variable site specific factors such as chemical quantity, toxicity, mobility, etc., relative to a sites proximity to such things as surface water supplies, areas serviced only by private wells, ACECs, or critical wetland habitats.

A revised Subpart C of the MCP would include a description of the criteria associated with evaluating the location of a site within a CRA. At this point, the Workgroup is proposing that the following areas be considered as CRAs for notification of releases of oil or hazardous material to *groundwater*:

1) Mapped Zone II areas, or where there are no mapped Zone II areas, the Interim Zone II or Interim Wellhead Protection Areas (areas within 0.5 miles of a groundwater well which defines a Public Water System, as defined in 310 CMR 22.00);

2) Areas located within a designated Sole Source Aquifer as defined in the Federal Safe Drinking Water Act, as amended in Public Law 99-339, Part C, Section 1424(e);

Some additional areas under consideration are:

3) Areas located within the Zone A or within 400 feet of the 100 year floodplain of a surface water body which supplies a Public Water System as defined in 310 CMR 22.00.

4) Areas located within designated Areas of Critical Environmental Concern (ACECs) as defined in 301 CMR 12.00.

5) Areas located within one hundred feet of a private water supply well, areas where there is a property or abutting property with a private water supply well in use, or areas which have been designated by the Department as critical aquifer protection areas.

The Workgroup is proposing that only the *first two* areas be considered as CRAs at notification. The Workgroup would like

specific comments on the following two issues:

1) The CRA proposal focuses on drinking water supplies from groundwater sources. Is there a way to map the watersheds of surface water supplies, such as that proposed in 3 above, which doesn't appear to be so broad?

2) Should the sole source aquifer criteria be eliminated in favor of only Zone IIs? (i.e., a CRA in a sole source aquifer would be the Zone II of a public water supply.)

Please provide comments on other areas that should be considered for CRA mapping. The 12/26/91 Notification Regulation proposal included a discussion of many of the issues raised by CRA mapping and Tier Classification at "release" notification. Readers should review this discussion for more background information. Comments are sought on all aspects of the CRA concept.

Subpart E Proposed Tier Classification Process:

In developing this Tier Classification proposal, the Workgroup reviewed several different types of site prioritization systems used by other State environmental agencies and the EPA. The goal of these systems is generally to prioritize sites which are the most serious threats to public health and the environment, produce public lists of priority sites, and to prioritize listed sites for regulatory agency oversight or enforcement. Priority lists are also used to determine which sites should receive public funding for response actions. The Tier Classification process has similar purposes. Therefore, the Workgroup spent a considerable amount of time reviewing several existing prioritization systems to see: 1) which methods would best suit DEP's needs, and, 2) whether any methods could be readily adapted for use by DEP. As mentioned, none of the systems reviewed by the Workgroup are used by private or independent parties such as LSPs as a part of a program to determine the need for regulatory agency response action oversight. All of them are used by Government personnel to determine internal-agency response action priorities.

After completing the review of various site prioritization methods, the Workgroup is proposing that a *site specific numerical ranking system* be developed to: 1) determine whether or not a site is a Tier I or Tier II site, and, 2), if Tier I, determine whether the site should receive a Tier IA, B, or C permit. The proposed ranking process would require that a Phase I level of site investigation be completed in order to have a sufficient amount of information to rank a site. Information about a site's location, contaminant types, quantities, accessibility, and potential exposure pathways, among other things, would be evaluated during the scoring process. (Please note that, in addition to site specific factors, section 3(d) of the 21E amendments requires the

department to consider "whether the persons who would obtain a permit or who would carry out a response action without a permit have demonstrated that they are able and willing to carry out the response actions in question." This consideration would not be readily apparent from site specific numerical scoring process.)

The attached document titled "Draft Numerical Scoring System for Site Classification" includes a proposed ranking process for review. Also attached is a document titled "Proposed Numerical Ranking System, Issues Presentation and Discussion", which includes a detailed presentation of the key issues surrounding the proposed site ranking system for review and comment.

Screening of Site Prioritization Systems:

The following is a brief overview of the site prioritization systems reviewed by the Workgroup.

Site prioritization methods generally fall into three groups: detailed and mathematically complex ranking systems, simplified numerical ranking systems, and qualitative, non-numerical priority systems. *There are some gradations between the extremes in these* categories. The two most complicated systems reviewed include the new EPA Hazard Ranking System or HRS and the new system proposed by New Jersey.

EPA estimates an approximate $60,000 cost for completing an HRS, which includes the estimated cost of a Preliminary Assessment and Site Investigation. A significantly less complicated system now used by EPA to screen sites is called the "PA-method" HRS. EPA estimates that the PA-Method HRS could be done in approximately sixty hours. Since the full HRS and the New Jersey system seemed too labor intensive for Tier classification, they were ruled out early by the Workgroup. However, the PA-Method HRS was retained for more detailed evaluation because the level of information required for completion appeared somewhat consistent with that which was proposed in the Interim Report for Tier Classification. The Workgroup also reviewed a fourth type of classification method which would depend on maps or on computerized map systems as a method to determine whether a site was to be classified as Tier I or Tier II.

The complete list of ranking systems screened for use is listed below:

A. Complicated Numerical Ranking Systems
   1. Full EPA Hazard Ranking System--also used by Minnesota Wisconsin and California.
   2. New Jersey Site Evaluation System
   3. Washington state.

B. Simplified Numerical Ranking System
   1. New HRS/EPA "PA Method"
   2. DEP Northeast region Site Triage/SLAM system
   3. DEP Western Regional Office Prioritization system
   4. Michigan Site Assessment Model

C. Map Methods
   1. Interim Report/Map Method proposal
   2. GIS Method

D. Qualitative, Discretionary Criteria
   1. New York Proposal
   2. Current MCP section 40.544 Interim Site Classification process.

The Workgroup evaluated these classification methods using the following evaluation criteria, in no particular order of importance:

*Level of site information required to classify a site.

*Level of effort required to complete a classification method.

*Simplicity and/or clear and defensible classification criteria.

*Reproduceability.

*Regulatory, legislative and enforcement history and experience.

*Public and Agency acceptance.

*Ability to fit into the redesigned 21E process, i.e., ability to limit the need for repeat evaluation of site information for Permit categorization, DEP permit calls or public funding decisions.

*Usefulness in providing substantive information for auditing.

*Effective evaluation of public health and environmental hazards for all exposure pathways.

*Ability to be used by a large number of parties, both within a regulatory agency and in the private sector.

*Amount of new or additional written guidance that would need to be developed to adapt a method for use by the private sector and DEP.

Review of Final Alternatives.

After screening each alternative, the Workgroup selected four prioritization systems for detailed evaluation: the existing MCP Interim Prioritization system (310 CMR 40.544), the EPA "PA Method" of the Hazard Ranking System (HRS), the triage system used by the Western Regional Office (WERO), and the Michigan Site Assessment Model (SAM). For the reasons discussed below, a numerical ranking system, based on Michigan's SAM system and the WERO system, is being proposed. Please see the attached ranking proposal and Issues Paper for specific details of this proposal.

The MCP's Interim Disposal Site Classification System.

The Workgroup felt that the Tier Classification process should reflect as closely as possible the intent of the present MCP's Interim Site Classification process for program continuity and to help ensure a smooth transition of sites classified under the existing MCP into the redesigned 21E program. This process has been used for several years to classify sites as "Priority" or "Nonpriority" for the purposes of listing, waiver eligibility, DEP staff oversight, enforcement action, or public funding. It makes sense that the outcome of a site classification in a redesigned 21E program reflects the same relative "importance" the site would have earned under the old classification process.

The existing MCP includes nine qualitative criteria which have been used by the DEP staff to classify 475 priority sites and 1130 non-priority sites since the beginning of the program. A total of 670 confirmed disposal sites remains unclassified. The existing regulations require at least Phase I information prior to classification. There is a general feeling that the level of effort required for the current classification system is sufficient to classify a site as Tier I or II. However, the Workgroup felt that the MCP's existing prioritization process would need to have more specific written guidance developed if it was to be applied state-wide to all sites by LSPs in a consistent way. While the existing MCP site classification process reflects the environmental and public health concerns that must be factors in Tier Classification, it does not include enough specific guidance or structure to be used effectively in a privatized system. Considering the short amount of time the Workgroup has to develop a site prioritization method, the Workgroup's conclusion was to spend time finding a more developed prioritization process that reflected the overall priority scheme of 310 CMR 40.544.

EPA's Hazard Ranking System.

An advantage of the HRS method is that it is based on a statistically significant, scientifically developed set of criteria

that will allow site scores to be compared nationwide. The EPA has developed an HRS PA-method which is more standardized than the full HRS scoring method. The HRS-PA method is used by EPA as a screening tool to determine a site's relative score before moving ahead to complete the full HRS scoring process.

The HRS-PA method has four pathway scores: air, groundwater, surface water and soil exposure. Each pathway score has three factor categories: likelihood of release, waste characteristics and targets. In turn each of the categories has several subfactors including waste containment and quantity, populations, land use, sensitive environments, precipitation, and so on. The total maximum HRS score is 100, and EPA has set the threshold number for listing on the NPL at 28.5. The HRS-PA method is used to screen out sites early that may score less than 28.5.

The HRS-PA Method was deleted from further consideration for the following reasons: 1) The system is overly conservative, designed to include sites with even a low potential for inclusion on the National Priority List; 2) the system lacks clear guidance and default values where site information is not available; and, 3) contaminant toxicity is not considered. However, the PA-Method HRS method was still used to score some test sites by the Workgroup for comparison to the proposed Tier ranking system.

DEP's Western Regional Office System.

The triage system used by the Western Regional Office (WERO) is a simplified numerical ranking system used by the WERO staff to determine which sites should be assigned to DEP staff. This system is based in part on the Northeast Region's triage scoring system, but it does not include Northeast's Short Term Measure evaluation step. The system does not have specific written guidance available. It is intended to be used by a small number of regional staff who would routinely use the system, thereby providing regional consistency of site scoring. Again, in light of the limited time available to the Workgroup, we felt that we should find a better developed existing prioritization system that retained the important elements of the WERO and NERO systems.

Michigan's Site Assessment Model.

Michigan's Site Assessment Model (SAM) is a simplified numerical ranking system used by the Michigan Department of Natural Resources (MDNR) to determine site priorities for internal MDNR staff assignments, enforcement, or state funded response actions. After considerable evaluation, the Workgroup concluded that the SAM provides a viable alternative to complicated numerical ranking systems, such as the HRS, while addressing the qualitative criteria in the MCP's site classification process. The SAM, only recently

promulgated in regulations in Michigan, is a revised version of a more extensive quantitative scoring system. The SAM has a proven track record having been used by a State environmental regulatory agency similar to DEP for some time. As a result, it has been selected as the foundation for the Workgroup's proposed Tier Classification proposal.

Two MDNR staff members visited the DEP to discuss the how the SAM model is used to rank sites, and how it came to be incorporated into regulations. For several years Michigan had used a complicated 2,000 point ranking system, created and published in guidance by the MDNR, to determine which sites would be placed on an annual published priority list and which of these listed sites would be targeted by MDNR for enforcement and/or publicly funded clean up. The annual scoring of new sites and the *rescoring* of sites already in the system required a considerable amount of both MDNR and PRP time. The MDNR's program was also challenged in a lawsuit by industry for using "arbitrary" standards which had not been promulgated in regulation. The court ruling required MDNR to promulgate a site priority system in its regulations and to bring the draft regulations to public hearing within a matter of months of the ruling. Since the scoring method had to be adopted as a regulation, and due to the short amount of time given MDNR by the court to complete regulations, the MDNR staff felt that they should simplify the scoring process as much as possible. The result is a 48 point scoring system that was adopted into regulations in July of 1990 after public hearing. It is now used by the staff to rank the hundreds of sites which require scoring every year.

The system utilizes six categories: environmental contamination, mobility, sensitive environmental resources, population, institutional population, and toxicity/quantity. One of the most attractive aspects of the system is that it evaluates sites based on the levels of information provided in a "Phase I" site investigation. Two important aspects of the scoring system involve "scoring" the toxicity and quantity of waste. Relative toxicities are published by the MDNR for use in the scoring system and are updated on a regular basis. There are three methods used to score relative toxicity and quantity. In method 1, the preferred method, the amount of an identified chemical on the site is known and used. Method 2 is based on concentration versus relative toxicity for a score. Method 3 uses the estimated quantity of unidentified wastes in volume or area and four waste classes established in the regulations according to relative toxicity of the associated waste stream. In any event, the SAM process was used as a model for the attached Tier Classification scoring proposal.

It is important to mention here a point that was raised by the Michigan DNR staff repeatedly. That is, the SAM was developed for *internal agency use only*. The MDNR staff felt that, in their opinion and based on their experience in Michigan, any scoring system used by consultants to determine site priorities could lead

to inconsistent site rankings. The Workgroup recognizes this potential problem and is working to ensure that appropriate training, periodic QA/QC review of the Tier Classification process, and various checks and balances in revised 21E program will build consistency into a privatized site ranking process.

Implementation Issues:

The following section presents some of the Workgroups ideas and concerns about implementing the Tier Classification process. Readers are asked for comments on the following issues or others which may not be listed.

Reclassification:

The Interim Report recommended that Tier Classification be based on a Phase I level of site information. Based on this information DEP and LSPs are to determine which sites are the " worst sites" which will require DEP oversight through permitting.

The Interim Report states in the Permit section that permitting would "constitute permission from DEP for potentially responsible parties (with licensed site managers) to perform a comprehensive assessment of the site and associated risks, and to plan and implement permanent solutions on the basis of that assessment." This specific quote and other language in the Permit and Imminent Hazard evaluation sections of the Interim Report establish that a *Phase I* equivalent is to be the baseline level of site information to be used for Tier Classification, Permit Categorization, and imminent hazard evaluations at Tier Classification. This is consistent with today's MCP which bases Site Classification on a Phase I report. (In addition, the Bureau's Interim Measures policy requires that a Phase I be completed before an Interim Measure can be proposed.)

The Interim Report also states that after a site is classified as Tier II, response actions would proceed with LSP oversight after the LSP notifies DEP of the Tier II classification decisions; DEP would file such notifications and audit compliance of a certain percentage of Tier II sites. For Tier I sites permitted as IB or IC, DEP would set permit conditions for response actions. LSPs would submit response action reports/opinions; DEP would audit a percentage of these submittals. The Interim Report was silent on the issue of *upgrading site classifications* if new information became available during the next phase of site investigation.

Pursuant to today's MCP, a Phase II site investigation must be completed to fully characterize the nature and extent of site contamination, exposure pathways, exposure points, and to develop a risk assessment. Under the Program Redesign, Phase II

investigations for sites which do not get Tier I A permits will not be overseen by DEP. Since it is possible that Phase II information could change a site's Tier Classification either up or down, the Workgroup is proposing that all sites (both Tier I and II) be rescored as part of a revised MCP Phase II process, *should significant new and/or better site information become available*. The level of effort anticipated for this activity is minimal and rescoring would provide increased confidence that DEP would in fact be overseeing the most serious sites.

The Workgroup is proposing that a site rescoring would be submitted to DEP by an LSP only if it:

1) resulted in an upgrading of a permitted IB or IC site to permit category IA, or,

2) resulted in a classified Tier II site being upgraded to Tier I.

The Tier Classification Workgroup will be working with the Permit Workgroup to further explore the implications of this proposal since rescoring would occur *after* a Phase II equivalent site assessment is completed. The permit process described in the Interim Report deals with permitting *prior to* conducting Phase IIs.

All existing ranking systems used by other states or federal programs that were reviewed by the Workgroup, except for EPA's PA/HRS, either rely on a level of site information for priority setting that is equivalent to the MCP's Phase II, or rescore sites frequently to accommodate new site information obtained during investigation phases. Michigan requires that any "location of a release" be rescored annually, using whatever new information is available at the time the annual "scoring cycle" occurs. Michigan's annual listing of site priorities is then adjusted according to the new site scores.

Reclassification of "priorities" in Massachusetts has been a standard practice since the MCP was adopted, and the Workgroup feels that the only way to determine whether or not DEP is overseeing the "worst sites" in the redesigned 21E program is to continue this practice. Reclassification is required for MCP waiver sites and for other site classified as "nonpriorities" should site conditions warrant such action.

Incentives.

The Interim Report lists a number of "incentives" that the redesigned 21E program would offer PRPs. These incentives are for the most part intended to motivate PRPs to voluntarily conduct response actions by eliminating bottleneck MCP decision points, clarifying PRP liability, providing more response action guidelines

and criteria, and providing "fast track" options for PRPs to get out of the 21E process early. This Tier Classification proposal is linked to a number of the Interim Report's incentive recommendations which are described below.

Interim Measures and Short Term Measures:

The Bureau's present Interim Measures and Short Term Measures policies explain how prompt initial response measures can reduce a site's risk, prevent contaminant migration, and reduce long term cleanup costs. The Interim Report is clear that PRPs should be provided similar opportunities to conduct such response actions in a redesigned 21E program. In many instances, these response actions may lead to "no further action" opinions prior to 21E permitting. As a result, Interim Measures (IMs) will likely be "the preferred response action" since IMs will be allowed at Tier I sites prior to permitting with only a 14 day presumptive approval. (Note that sites would need to be classified before an IM could be proposed.)

Short Term measures are required to address imminent hazards so, in that sense, they will not be an elective option like IMs will be. However, STMs could also lead to NFA recommendations at Tier I sites prior to permitting.

The Workgroup wants to emphasize the importance of detailed IM/STM guidance which includes NFA criteria, IM/STM performance standards, implementation criteria, and post remedial action monitoring criteria. These criteria must be developed to ensure that NFA/"permanent solutions" after IMs or STMs eliminate "significant risk". Criteria must also be developed that will allow for a smooth transition of sites where IMs or STMs have not achieved permanent solutions into the Tier Classification process.

Timelines and the Phase I Level of Effort for Site Investigations.

The Notification Regulation proposal provided up to one year after "release" notification for a site to be classified. However, this is a *maximum* amount of time. The way the timelines in the notification proposal are structured, a PRP may notify DEP of a "release" *after* having completed a Phase I equivalent level of site investigation. As has been proposed here, the Phase I equivalent site investigation is the baseline level of effort necessary to complete the numerical Tier scoring process and to make a permit category recommendation. Therefore, it is conceivable that a PRP who wished to do so could include with a "release" notification a Tier Classification and a Permit application, all within 90 days of obtaining "knowledge" of a release.

The Workgroup hopes that this "one-stop-shopping" option will make the MCP process much simpler for those PRPs who wish to voluntarily conduct response actions.

PROPOSED REVISION TO THE MASSACHUSETTS CONTINGENCY PLAN

SUBPART E TIER CLASSIFICATION REGULATIONS PROPOSED NUMERICAL RANKING SYSTEM ISSUES PRESENTATION AND DISCUSSION

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This paper describes the key areas and issues regarding the classification of sites. Tier classification would be used to determine whether or not 21E response actions at Subpart E disposal sites prepared by LSPs require DEP oversight. It would also be used by DEP staff to determine priorities for permit calls, state funded response actions, or enforcement.

There are two proposed classes of sites in the program redesign: Tier I sites, to be cleaned up under permits and a relatively higher degree of DEP oversight; and Tier II sites which will be cleaned up without permits and with no DEP oversight under 21E other than auditing. The paper describes various technical and policy considerations in the development of a proposed numerical ranking system to classify sites. The proposal of the work group is the result of a review and comparison of various numerical and qualitative ranking systems used by the DEP, environmental agencies in other states and the Environmental Protection Agency. In addition, options and alternatives are described which have been created by individual Work Group members to solve specific problems in the ranking system. Comments are solicited on the key issues surrounding site classification using the proposed numerical ranking system.

The key areas/issues addressed are:

1. Complexity
2. Discretion and Consistency
3. Level of Effort and Site Characterization
4. Toxicity, Quantity and Mobility

5. Potential Human Exposure

6. Potential Environmental Exposure

7. Other

1. COMPLEXITY********

Issue: What levels of complexity are appropriate for a Tier Classification System?

Classification is not risk assessment or management in the strictest sense. Instead the numerical ranking system which is proposed by the work group for use in Tier classification is intended as a method to compare sites to each other and decide which ones the DEP should oversee and which ones the DEP should allow to proceed through clean up without a permit under 21E.

All sites, permitted or not, will require Licensed Site Professionals (LSPs) to oversee and manage site response actions. The Tier Classification system is not intended to be used as an indicator of required clean-up levels. On the other hand, the system must be sophisticated enough and consider environmental and public health factors to differentiate between "bad" sites where the DEP truly feels oversight of response actions are needed and "less bad" sites where less oversight of LSP supervised response action is needed. The work group has attempted to strike a balance between highly complex and confusing numerical ranking systems, such as the EPA's Hazard Ranking System (HRS) and simple, qualitative systems like the Interim Site Classification section in the existing MCP, which are subject to much ambiguity and interpretation. The proposed simplified numerical ranking system is an attempt to balance these extremes. It was derived empirically from the Michigan Site Assessment Model or SAM. SAM has the advantage of having been used for a number of years by a regulatory agency, the Michigan DNR, to rank the relative seriousness of sites for purposes of determining public listing and public funding, as well as staff oversight.

Issue: What is the correct balance between the complexity and the ability to manipulate a site classification?

At the high end of the complexity scale are numerical systems, like the HRS, which has many numerical tables for each of four environmental pathways, where the scores are squared, added, divided by four, and the square root of the quotient is taken. Although highly complex and confusing, this scoring system is designed to cut down on score manipulation so that sites may be prioritized nationwide.

The state of Michigan originally had a 2,000 point, highly complex scoring system. When the current SAM system was promulgated, however, the ranking was simplified to a 48 point maximum, and many of the more minor environmental factors were eliminated. Although easy to understand and apply, this system was designed solely for use by Michigan DNR staff, who agree that this ultra simple, low point spread ranking system, would be too discretionary for use by private parties, rather than agency staff.

Work Group Recommendation: The proposed numerical scoring system has a total possible score of 600 in order to include sufficient point spread and the key factors the DEP wishes to consider for environmental and public health concerns. This is intended to be a compromise between a large number of points or mathematically complex methods of equalizing scores, versus simplified, low point spread scoring systems which can be more easily manipulated to change a site classification. A 600 point range is also important since the proposed scoring system is to have three cut-off points as shown in Figure 1: One between Tier II and Tier I; a cutoff between Tier IC and IB; and a cut-off between Tier IB and IA at the top of the range. Comments are solicited on: the relative complexity of the proposed numerical ranking system which has a 600 point maximum score; the site management issue of cut-off scores and; other factors which contribute to the complexity of a site ranking system.

2. USE OF DISCRETION AND CONSISTENCY IN SITE CLASSIFICATION****

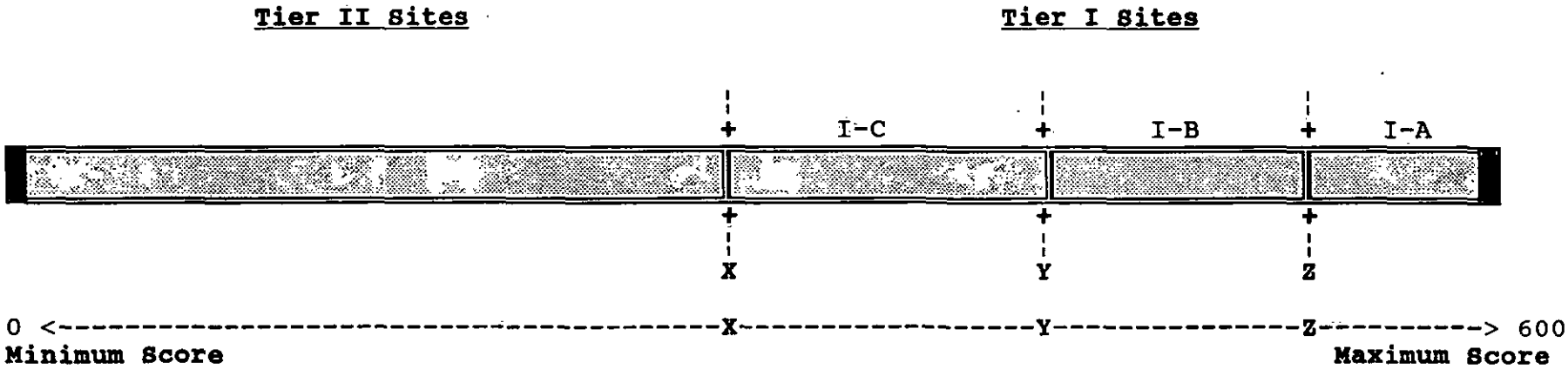
Issue: What is the appropriate level of discretion to be used by LSPs in site classification?

Site prioritization systems, such as the existing MCP, rely almost completely on the discretion of the person performing the ranking of the priority criteria for the site. Even the simplified numerical ranking system used by the Western Regional Office relies on a great deal of judgement and discretion on the part of the staff person rating the site. Moreover, staff members of the Michigan DNR, with whom we discussed the SAM in great detail, commented that it is intended to be used only by agency staff to prioritize sites, even though the SAM is published in regulations which PRPs can and often do use to show they should have a lower priority site. There may be a wide difference between the numerical score given by a DEP staff person and that of a PRP's consultant.

Work Group Recommendation: The Work Group has modified the Michigan SAM system by adding the proposed use of many "look-up" tables and required assumptions and values, given certain site conditions. Although certain facts and assigned values are proposed to be written into the regulations, as presented by the proposed scoring sheets, many look-up tables to assign scores could

FIGURE 1

PROPOSED NUMERICAL RANKING SYSTEM FOR TIER CLASSIFICATION



Cut-Off Scores

X = ?
Y = ?
Z = ?

be included as appendices to the MCP. Detailed instructions on evaluating and choosing numbers from the look-up tables may be more appropriate as DEP guidance documents, so they may be updated without amending the regulations. Comments and ideas are solicited on how to reduce discretion and increase both certainty and fairness of the proposed scoring system for the public and the regulated community.

Issue: How can the classification system ensure the greatest consistency since it will be used at a number of sites by a number of LSPs?

This issue is related to both the complexity and discretion issues. The primary reason why a simplified numerical scoring system is proposed is to minimize variation between individuals responsible for classifying sites and also to minimize the technical complexity of a rating system. This means reducing the use of subjective judgements and increasing the use of objective criteria in the site classification system. The intent of the work group is to create a numerical scoring system which is relatively easy and straightforward to apply and once completed, can be compared to a cut off score which would be set in the regulations. Such cut-off scores are not without precedent. The US EPA has set a cut off score of 28.5, using the 100 point HRS as the absolute cut off for the National Priority List. On the other hand, while Michigan uses the SAM for public listing, they use a "sliding scale" to determine public funding for projects. For every annual list and ranking, the Michigan DNR proposes projects to the Michigan Legislature, starting with the highest scoring sites and going down the list until the money for site clean-up projects in that year runs out.

Work Group Recommendation: Once the numerical scoring system is promulgated in the regulations, it could be applied to any site, and by comparing the site score to the cut-off score, the LSP and PRP would know immediately if the site is below that score (a Tier II) or above that score (a Tier I). The work group proposes to set the cut-off score between Tier I and Tier II in the regulations. Comments are solicited on this approach.

Issue: Setting cut-off scores for Tier II sites.

As previously mentioned, the proposed numerical scoring system will require three cut-off points, as shown in Figure 1. The Work Group considered how the numerical value of the cut-off score should be determined, especially between Tier II sites and Tier I sites, but also to classify permits. There were several options considered.

Option 1: Desired Number or Proportion of Tier I/II Sites.

The cut-off score would be selected to yield a desired number or

proportion of Tier II sites as compared to Tier I sites. For example, if the DEP had resources to oversee only X% of all sites, the cut-off score would be set, after testing with a number of sites, to the numerical value that would lead to the desired proportion, X%, of Tier I sites. This system is relatively arbitrary and is based only on anticipated DEP resources.

Option 2: Set Tier I Equal to "Priority"; Tier II Equal to "Non-Priority."

Another alternative would be to score all the confirmed disposal sites, which have been prioritized in the database, and set the cut-off score so that most non-priority sites or waiver sites would be Tier II and priority sites would be Tier I. Table 1 shows the proposed numerical ranking system scores for a few actual sites where the MCP prioritization and the HRS score are known, and some theoretical or generic sites. The maximum score for a complex, industrial, priority site with many releases is 268. The minimum score for a release from a home heating oil tank, with no groundwater contamination is 86. Using existing priority and non-priority sites, approximately 350 of the 1600 classified sites, or 30%, are priority sites. The advantage to using existing priority and non-priority sites to set the cut-off score would be the ease in transition for the DEP to a new site ranking system. The disadvantage is the perception that the DEP is retaining the business-as-usual approach and not substantially changing the way it assigns resources to sites.

Option 3: Weight Specific Situations

A third option is to weight specific exposure situations more heavily in the scoring system. By increasing the scores of specific elements, many sites with key characteristics would be at the upper end of the scoring range. Most sites, without these key characteristics, would be at the lower end of the scoring range. Using this idea of primary, or high scoring, elements versus secondary, or low scoring elements, the cut-off score for Tier I or II would be set in the middle of the scoring range. Sites with only secondary characteristics would require many secondary elements and relatively few would make it above the cut-off score. For example, assume the Tier I/II cut-off score were 140 points, and a site is near a large water supply reservoir, yielding a score of <u>at least</u> 150 points, before any other site factors are considered. By scoring the proximity and size of the reservoir first, the scorer would immediately know the site was a Tier I site. With the same cut-off score, assume a site has no "high scoring" elements. In order to be classified a Tier I site and be above the cut-off score, it would have to have many, somewhat less priority characteristics to add up to the cut-off score of 140.

This option has the advantage of ranking important resources first

TABLE 1

COMPARISON OF SITE SCORING SYSTEMS

SITE NAME	SITE SCORING METHODOLOGY		
	MCP	HRS PA[1]	NEW SYSTEM[2]
Solvents and Dye Sludges in Soil & Groundwater	Non-Priority	50	151 Method 1
Tannery Wastes in Soil & Wetlands	Non-Priority	51	176 Method 1
Rural Paint Sludge and Solvent Disposal Site	Priority	17	150 Method 2
Major Industrial Site	*Priority*	87	268 Method 2
Private UST Leak, no well contamination			86 Method 2
Private UST Leak, in Zone II or ACEC			146 Method 2
Commercial UST Leak, site workers, no groundwater contamination			101 Method 2
Commercial UST Leak, site workers groundwater contamination			106 Method 2
Waste Oil Pit, urban, abandoned groundwater contamination			96 - 106 Method 1
Waste Oil Pit, urban, groundwater and private well contamination			126 - 156 Method 1
Pesticide Pit, wetlands, school, no groundwater contamination			116 - 146 Method 1
PCB Lagoon (Rose Superfund Site)	Priority	33.73 -32.89[3]	156 Method 1

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1 Based on a maximum of 100 points. The threshold level for possible inclusion on the National Priorities List is 28.5.

2 Based on a maximum of 600 points.

3 Full HRS score range.

and allowing the scorer to know, with very little information about the site, if it is at least Tier I. More information would then be used to determine the "grade" of the Permit (A, B, or C). Sites that are truly Tier II, and have no primary, high scoring elements, would have to work through all the secondary elements, with some level of information, to show they did not add up to a cumulatively "bad" site, above the Tier I/II cut-off score. It appears that this option could be designed to yield few sites which fall mid-range at the cut-off score. This may make the task of auditing Tier classification somewhat easier for the DEP.

Work Group Recommendation: The Work Group does not have a specific proposal to deal with the issue of setting the cut-off score. Some combination of the three options above, or others, may be possible. Comments are solicited on the options for setting the cut-off score. In addition, participation of the Work Group with an ad hoc subcommittee may expedite the synthesis of a method to set the cut-off scores.

3. LEVEL OF INFORMATION AND SITE CHARACTERIZATION**********

Issue: What is the appropriate level of effort which the PRP and LSP must exert in order to classify a site?

The work group proposes to allow submittal of a site classification package, including the numerical ranking and appropriate documentation, to be set at a level which approximates the Phase I or limited site investigation in the present MCP. This means limited sampling data and procurement of information on environmental resources in proximity to the site. It is intended to be a similar level of effort to that required for a staff member to prioritize a site today or, for example, to review the prioritization for a completed waiver package. This level of effort is based on the work group's interpretation of the Study Committee's report on program redesign. Alternatives would be to allow scoring at the Preliminary Assessment level of effort, and no additional sampling, or to require a Phase II level of study, complete with groundwater exploration and monitoring well data. Simply put, the work group feels the Phase I level of effort is appropriate for classification, neither too little, nor too much. One of the reasons the simplified numerical ranking system was selected, however, is that it can conceivably be used with a level of effort and documentation ranging from a PA to a Phase I to a Phase II. Comments are therefore solicited on the level of effort proposed to support site classification.

Issue: Should a numerical scoring system be used for other purposes--such as the classification of I A, B and C sites or to support NFA decisions?

The work group proposes that the numerical ranking system be used

for both the Tier II and Tier I cut off determination as well as the initial classification, set by cut-off scores, of the Tier I permits into A, B and C. Other factors, such as the ability of the PRP to go forward and do work could be considered at the permit application stage to determine the final permit classification. Since the proposed scoring system is not risk assessment or risk management and does not really reflect risk reduction as contemplated in the statute, the use of the numerical ranking system is not recommended for use in No Further Action (NFA) determinations. Comments are solicited on this concept.

4. TOXICITY, QUANTITY AND MOBILITY********

Issue: What is the appropriate amount of analytical data necessary to estimate the quantity or type of waste present on a site?

One of the key issues in any site ranking system is the best way of evaluating the quantity of a given release or contaminant from site to site. The evaluation, for purposes of the program redesign, must be initially based on a limited set of data. As a practical matter the LSP may have only a few soil or groundwater samples on which to estimate the worst chemical threat on the site by concentration, estimated quantity released or the extent of soil or water believed to be contaminated.

Discussion

While not now evaluated in the existing MCP, some scoring systems, such as the HRS, rank the toxicity, quantity and mobility of each contaminant observed to be released on the site within each media. This leads to a complex method of evaluating relative quantity from site to site. The Michigan SAM compares quantity to toxicity for all contaminants to yield one score for both factors by three possible methods: quantity released; concentration of a known substance; or waste type and estimated areal extent or volume of unidentified contaminants. The problem is how to get a scoring system to accurately reflect the quantity of oil or hazardous materials on the site, based on limited information, and how to motivate the LSP and PRP to obtain the best information possible on quantity to complete a site ranking. The work group looked at five generic ways of dealing with this problem.

Option 1: Preference for Quantity

The Michigan SAM has three methods of dealing with quantity of contamination and the level of knowledge of a site. Method one is preferred, and it ranks the quantity of material released on the site. The second preference is the use of concentration of substances found on the site. The third method, and least preferred, is an estimate of areal extent or volume of a waste type, where specific contaminants or quantity of substances are

unknown. An example of how this works would be a gas station site. A staff person assigned to rank the site would first look for a known quantity of known substances released on the site, such as the known volume of an underground storage tank which lost product. If this type if information was not available, the staff person would then look for analytical data and use the concentration of known substances such as petroleum hydrocarbons, and that would be the basis of the ranking. If the gas station had been abandoned for a long time and no quantity or concentration from analytical data were found in the file, the staff person would use the waste type "petroleum" and estimate the area or volume of soil affected by the old sources of contamination on the site.

From Michigan's point of view, a known quantity of a known waste is a much better and preferable estimate of the seriousness of the site. This is because samples representing the concentration of known contaminants may not have been taken in the highest concentration areas, yielding the highest score. The Michigan SAM system provides method three, using waste type and estimated extent because some sites have very little information when they are required to be scored. The Michigan staff repeatedly emphasized to the work group that this method was meant for use by staff and not PRPs or their consultants, and that it would probably have to be modified for our program.

Option 2: Require Analytical Data

The work group believes it would be possible to require that a site be scored on analytical data and hence, concentration alone. Requiring some sort of analytical data for each media would be relatively easy to audit. On the other hand, this method may not truly reflect how bad a site is, since large amounts of waste may have been released, and the concentration of individual contaminants may not reflect this.

Option 3: RCs or RQs only

This option would require the site scorer to rank the site based on the concentration or quantity reported under the release notification regulations. Again this would be relatively easy for the DEP to audit. The argument against this method is primarily that it gives no credit for a removal which may have been performed in the year between notification and site classification, even if the PRP and LSP had analytical data from confirmatory sampling after the removal action. This problem existed in EPA's HRS for many years because the old version of the HRS required the site to be scored as if all wastes ever on the site were still there. Because of vociferous criticism on the part of the regulated community, including the very legitimate concern that the HRS regulations did not encourage prompt removal actions, the EPA has changed the way it deals with removed wastes in the HRS score. The EPA now allows a site to be scored without the removed waste

quantity by taking into account the removal of waste which was done prior to a certain point in the assessment process and if there is confirmatory sampling.

Option 4: Use Contaminant Types

This option would require analytical data to be compared with classes of contaminants such as chlorinated solvents. Each class of contaminant would have a ranking assigned, depending on set concentrations in soil or groundwater. Tables of the contaminant group concentration ranges would be provided in the regulations to assign a score to a site. This method would provide a ready way for dealing with the most commonly found site contaminants in the DEP's experience. It also provides a degree of certainty, quickly for many sites. Unfortunately this method is somewhat inflexible, as in Option 2, in requiring analytical data. It also does not deal with the problem of a site where the quantity of a substance released is known and might represent a more serious situation than represented by contaminant concentration.

Option 5: Waste Type and Estimated Volume.

The sample scoring proposal allows the flexibility, in method three, to score the site with no analytical data and no known release quantity. Because of the uncertainty of using waste type and estimated areal extent or volume, the scores in this section have been doubled relative to methods one and two. Allowing the use of this method would mean the LSP could score the site without analytical data, but the "penalty" would be a higher assigned score than the other two methods. One of the drawbacks to this option, is that a site could be ranked as Tier II with no confirmatory analytical data to show the level or quantity of contamination. One variation of this option would be to allow the use of Method three only with specified written justification to the DEP. DEP could also use the method to set internal priorities for sites which are not moving through the system and have little information.

Work Group Recommendation: The Work Group Proposes a combination of Options 1 and 2, but believes that this issue needs to be examined in detail by an ad hoc committee. It appears reasonable to at least require soil and groundwater analytical data in a Phase 1 study to be able to justify a low ranking score and a classification as Tier II. In addition, this type of data would be needed to differentiate between levels of Permits A, B and C for Tier I sites, using the scoring system. Comments are solicited on options to rank contaminant quantity.

Issue: How can the classification system reflect the extent of site contamination?

The dilemma of a site classification system in the program redesign

highlights the interrelated issues of the level of effort and information generally available at the proposed Phase 1 and the need or desire to evaluate the extent of contamination. The concentration or quantity data discussed above are proposed because they are intended to be based on known information. Method 3, in the proposal, is only used with a waste type, based on the past use of the site and it recognizes that the areal extent or volume of soil and/or groundwater contamination would be a gross estimate without analytical data. The current proposal does not take into account the extent of contamination because of the difficulty in determining how much analytical data should be required or how many samples must be taken to support a score for this site characteristic. Some options include using an adjustment factor or multiplier for each score based on a required level of analytical data or known quantity. For example, a small contamination area of less than 10,000 sq. ft., or a "hot spot", would get a 0.5, multiplier, reducing the score. An area of 100,000 sq. feet areal extent of an estimated contamination plume would receive a 1.5 multiplier, increasing the score. It has also been suggested that higher points be assigned for contaminants in "non-source" areas, which are greater than a certain size.

Another way of dealing with what has been described as the "Achilles Heel" of the proposed site scoring system is to require Method three for quantity, since Method three contains areal extent or estimated volume of a waste type. The LSP would be required to support the opinion of estimated areal extent or volume based on Phase 1 analytical data and other site information--such as history, location of activities, tanks and waste sources.
All three methods of ranking quantity and toxicity could be required, and the one yielding the highest score would be the required score.

Work Group Recommendation: While the work group recognizes that the lack of a required estimate of areal extent is a weakness, it could think of no reasonable way to require a determination of the extent of contamination. Extent of contamination, by its very nature, would appear to require a Phase II level of effort to achieve even reasonable estimates. The fact that the proposed scoring system would rank a "hot spot" of limited contamination high, while rating lower levels of extensive contamination lower is a problem. Although it should be repeated here that site classification with the proposed scoring system is NOT risk assessment or the setting of clean up levels, some of the same principles may apply. In risk assessment, the highest value of contaminant which is available for exposure to the receptor is used to assess the site. Ignoring areal extent and only using the highest concentration of the most toxic substance to rank a site appears to be similar in philosophy. The work group has no recommendation to solve its inability to include extent of contamination in the ranking system, and instead solicits all comments and ideas on this subject.

Issue: What is the best way of ranking the relative toxicity of contaminants found on-site?

The above section references the fact that many site prioritization systems, including the current proposal, rank the relative toxicity of contaminants found on the site. The ranking of the toxicity of chemicals is NOT risk assessment or management. It is instead a way of comparing sites, all other things being equal, based on the toxicity of the contaminants found there. It is simply one more factor which is important to the DEP and other regulatory agencies to set priorities for site work. The work group considered various options to deal with the issue of RELATIVE toxicity.

Option 1: HRS Toxicity Ranking

As with most other aspects of EPA's HRS, the rating of relative toxicity is complex but is designed to be able to compare sites across the country. It has the advantage of nationwide scrutiny by the scientific, regulated and citizen communities, since it is published in Federal regulations as part of the new HRS score. The method is performed for each of four media. Tables for scores based on toxicity ranges are provided, with the following hierarchy:

1. If both the reference dose (RfD) for non-cancer effects and the slope factor for cancer effects are available for a chemical, use which ever yields the higher score. Carcinogenic slope factors are related to carcinogen group, based on the confidence level, to yield a score.

2. If only one value is available between the RfD and the slope factor, use it.

3. If neither the slope factor nor the RfD are available, use acute toxicity to assign a value.

An advantage of this method is that it does not require the regulatory agency to update toxicity values solely for the purpose of ranking sites. EPA updates RfDs, slope factors and acute toxicity on a regular basis, given recent scientific research. One disadvantage of this system is its complexity.

Option 2: Michigan Published List

Michigan takes into account a number of factors for toxicity of chemicals and publishes a list of potential toxicity scores every several years, which are appended to the SAM regulations for use in

the site scoring system. The Michigan potential toxicity score means the toxicity rating of a hazardous substance. The potential toxicity score of a hazardous substance may include its genotoxicity, acute and chronic toxicity, bioaccumulation, persistence and other adverse effects. The inherent physical and chemical characteristics are assessed to determine the nature of possible health hazards imposed on the human population, other terrestrial animals, aquatic organisms, birds and plants.
The system is not complex to use, in that it involves merely referencing the site contaminant toxicity value on a table. Michigan must update the list and amend regulations accordingly, when new scientific evidence becomes available to significantly change toxicity scores.

Option 3: Create List of 33 Chemicals or Chemical groups.

In this option DEP would publish a list of chemical groups or a limited number of chemicals, such as the list of 33 most common chemicals in the proposed notification Rcs. Values could be assigned according to the standard RfD, slope factor and toxicity factors used in the HRS as well as the professional judgement of DEP staff in developing the list. A higher score could be assigned for chemicals or groups of particular concern to the DEP because of their mobility or known impact in the environment. Chlorinated volatile organic compounds are a good example of a chemical group of particular concern to the DEP, based on its experience with oil and hazardous material sites. This could also address the problem of the high toxicity values which metals may receive, using standard references, even though the movement of metals in the environment to potential receptors is relatively rare, based on site experience. The disadvantage of this alternative is that it will require DEP resources to establish and update a list of toxicity values, as information and experience with the chemicals becomes available.

Option 4: ORS Proposal

This option was created by DEP's Office of Research and Standards (ORS) as a part of the work group's activities, in order to solve some of the problems outlined above. It would establish toxicity scoring values based on three, readily understood, available and continuously updated factors, established by the EPA: threshold effects, reference doses (RfD) and carcinogenic categories, based on confidence factors. The LSP would look on a table for each chemical of concern. One table would be established to assign a relative score based on threshold effects for acute toxins. Another table would assign a score based on the reference dose for chronic non-carcinogenic effects and carcinogenic category. The carcinogen category means a known carcinogen gets a higher score than a suspected carcinogen. After consulting the tables, the highest score would be used for the most hazardous chemical found. The most hazardous chemical, in the classification proposal, is

that chemical which yields the highest score when toxicity, and quantity and mobility are added together. The option considers not only relative toxicity, based on constantly updated EPA databases, but it also takes into account the quantity and mobility factors. By using the "most hazardous substance" concept the proposal may address some of the legitimate concerns expressed in Option 3 to establish values based on experience with mobility and other factors.

Work Group Recommendation: The Work Group recommends Option 4. The relative toxicity score in this option is relatively simple and straight forward but takes into account threshold values, carcinogenic categories and reference doses. The score in this section would be based on the most hazardous substance found from the combined quantity, toxicity and mobility scores. Comments are solicited on this approach, as well as on other methods of ranking relative toxicity.

Issue: What is the best way of ranking the relative mobility of contaminants found on the site?

The relative mobility of contaminants in the environment is a key factor to be ranked in comparing one site to another. The ability of a contaminant to move from its on-site source to a potential human or environmental receptor is a crucial element in the scoring system. The work group considered several options to deal with the issue of contaminant mobility.

Option 1: Solid, Liquid, or Gas.

The Michigan SAM, has a simple rating, within the 48 point site scoring system, of solid (1 point), liquid (3) or gas (5), for substances found on the site. This simple ranking has been retained in the current proposal. It has the disadvantage of neglecting key factors of contaminants--such as the ability of the contaminant to move from the dissolved liquid phase to the gas phase. Volatile contaminants contained in the groundwater, for example, might be ranked as "liquid", but they can easily migrate to receptors in homes to become a problem as a gas.

Option 2: NAPL

Work group members have suggested that the presence of NAPL, a non-aqueous phase liquid, is a gross insult to the environment and possibly to public health. Floating product, or a contaminant discovered on a site as light non-aqueous phase liquid or LNAPL is a common occurrence, and frequently trips the MCP priority criteria, as follows:

"Criterion 2 is met if there is evidence of or data that indicate the presence of uncontained migrating oil or hazardous materials which exist as a separate phase in groundwater or surface

water."

In the groundwater, "sinkers" or substances heavier than water may form dense non-aqueous phase liquids or (DNAPL). While the presence of LNAPL may be readily apparent, even visually at a site with only Phase I information, DNAPL is relatively difficult to detect at this stage of assessment. The presence of NAPL of either variety arguably contributes to its potential mobility in the environment. Although the Work Group has not found another site priority system which rates or gives importance to the presence of NAPL on a site, Massachusetts has ranked a significant number of sites as priority because of this criterion. This option would require added points for the presence of NAPL, as a separate mobility criteria or it would be included between liquid and gas in the mobility criteria table of the proposed scoring system.

Option 3: Use Physical/Chemical Constants to Rank Mobility

This option would set additive mobility values for three constants which would be readily available to the regulated community in standard chemical references: vapor pressure, solubility and the octanol/water partition coefficient. These factors, respectively reflect the ability of the substance to move from a liquid to a gas, to dissolve in water, and to move into water from an organic material, such as sediment. Theoretically, they reflect relative mobility, however the application of these three factors would add complexity to the scoring system. In addition, they may not reflect actual mobility of substances based on DEP field experience with contaminants at sites.

Option 4: DEP Chemical Mobility List

This option would establish a High, Medium or Low rating of approximately 300 chemicals. These could be established based on the three theoretical migration factors discussed in Option 3, as well as levels of concern for mobility, based on DEP field experience with environmental and public health problems. In the Northeast Region, for example, virtually every contaminated public water supply contains chlorinated volatile organic compounds. Very few of the same contaminated supplies also contain petroleum products. Because mobility of a substance in the environment is a complex process, subject to reaction with air and bacteria, some contaminants on the high, medium and low mobility list proposed, may receive a higher ranking than would be dictated by the theoretical constants described in Option 3.

Work Group Recommendation: Option 4 is recommended as part of the proposed numerical scoring system. The recommendation also includes the simple rating in Option 1 for solid, liquid or gas. Comments are solicited on the possible addition of a criterion and an assigned score for, Option 2, the presence of NAPL.

5. HUMAN EXPOSURE POTENTIAL********

Issue: Should the density of residential population around a site reflect a higher score for classification?

Many scoring systems for sites rank a site relatively higher if it is in a densely residential area. Even though this is true, the existing MCP does not take into account the relative residential population in determining a priority site. The advantage of including a residential population factor is that it indicates a gross level of concern for site clean up activities where there is a diverse residential population in close proximity. Aside from an adjustment of the proposed site score, another alternative considered by the work group would be to eliminate the residential population altogether from the scoring system. This has the disadvantage of eliminating any factor to reflect dense urban ares, in ranking a site. The possible migration of vapors into residential buildings is a serious site matter which should somehow be included in a site ranking system. Even so, the residential criteria does not directly relate to the possibility of vapor migration to locations where people live. An additional option may be to add a criteria for proximity to the nearest occupied residence, or to replace the residential population criteria with a nearest residence criteria.

Work Group Recommendation: The work group recommends that a residential population scoring factor be retained in the proposed scoring system, in order to address more urban areas. In addition, comments are solicited on whether or not the distance to the nearest residence should be added to or replace the residential population score. Comments are also solicited on the 1/2 mile impact and evaluation area, and whether some other distance would be more appropriate.

Issue: Is the level of ranking for the presence of institutions such as schools in proximity to the site, appropriate when compared to other factors?

In both the new HRS as well and the Michigan SAM system, institutions in some proximity to the site are considered as factors in ranking a site. These include schools and nursing homes where particularly vulnerable populations may be found. A recent amendment to the Chapter 21 E statute requires that a disposal site within 500 feet of a school be designated as a priority site if the children could have increased exposure to oil and hazardous materials from the site. An absolute designation as a Tier I site is, for example, a potential alternative which would require categoric classification for a permit, if a site were located within a certain distance of a school. This option lacks the

flexibility of a scoring system, where the school or other institution is only one of many factors designating a Tier I site. Alternatively, the institutional population could be given higher weight as compared to other factors, such as environmental targets.

Work Group Recommendation: The proposed scoring system rates 10 or more points to sites within 1/2 mile or less of at least one institution. Although this is a very small percentage of the overall maximum score of 600 points, in actual practice site scores will probably be much lower, and the institutional population could be a tie breaker between two "equally bad" sites. Comments are solicited on alternatives to this approach.

Issue: Should additional points be assigned for a site within a Zone I of a public water supply well?

The current scoring sheet assigns extra points for a site located within a Zone II. No additional points are assigned for a location within a Zone I. Since no development is allowed within a Zone I, or within 400 feet of a water supply well, this would make sense. However, development may exist in these areas since existing development may have been grandfathered into a Zone I area. Accordingly, extra points could be assigned to any site located within Zone I or within 400' of a water supply well.

Work Group Recommendation: Comments are solicited on the inclusion of extra points for a site located in the Zone I of a public water supply well.

Issue: Should the number of people using a public water supply be used to rank a site for classification?

The scoring proposal includes a substantial increase in the score for a site near a public water supply which serves a large number of people. A site within a Zone II of a public water supply well or 400 feet of a water supply reservoir which serves 50,000 people or more, receives an additional 25 points. Only 5 points are added if the supply serves less than 100 people. An alternative to this approach is to reduce or eliminate this score, so that the system is equally protective of all public water supplies.

Massachusetts Drinking Water Regulations require more frequent testing for public water supplies which serve 10,000 or more people because of the potential public health impact. Certainly, there is a greater probability that contaminants from a site within the Zone II of a large system may be detected during the required testing, and the system would be shut down to reduce the threat to public health. The larger the system, the more frequent the testing and the greater probability a contaminant will be detected. On the other hand, failure to detect the contaminant in a timely manner might result in a greater public health impact. In either case, the system would require temporary or permanent closure and the

need to find an alternative supply for a number of people. It can be argued that replacing a supply for a system serving 50,000 people is far more difficult than for a system serving 50. Additionally, DEP requires less frequent testing for a small system and a contaminant could go undetected for a longer period of time thereby increasing the potential risk to public health. However, the potential risk is to a much smaller population.

There are additional pros and cons in this issue. While contaminants which could reach large supplies would become much more dilute than small supplies, this factor could be offset by the fact that larger pumping wells can pull in more contaminants at a faster rate and from a greater distance.

An alternative approach would be to adjust the scoring system to reflect the percentage of a community's water supply provided by the well, as opposed to absolute numbers of people served. In other words, if 100% of a community's water is supplied by a single well, that site, if affecting the well, would receive significantly more attention than would an affected well that provides only 20% of a community's water supply.

Work Group Recommendation: Because of a larger potential risk and the difficulty of replacing a supply, as described above, the DEP's Bureau of Resource Protection (BRP) regulates larger systems which serve more people more stringently than smaller systems. The Work Group feels that the BWSC should use similar criteria in promulgating regulations for sites. Therefore, the Work Group recommends a higher site score and that more oversight be given to sites which are close to larger water supply systems. Comments are solicited on this approach.

6. ENVIRONMENTAL EXPOSURE POTENTIAL********

Issue: Is the level of ranking for environmental resources appropriate when compared with public health and other resources and factors?

This issue mirrors the classic debate inherent in environmental and public health regulatory agencies. Is the level of concern and balance between public health factors and environment the "right" balance and "good" public policy? Generic alternatives to the proposed approach include the reduction or exclusion of the environmental exposure section of the ranking system. This alternative has the disadvantage of reducing or ignoring important environmental resources which could be damaged by a poorly planned or executed remedial action. In extreme cases, PRPs and LSPs could carry out cost effective clean up while ignoring important natural resources. Alternative approaches would rate environmental resources very high in a site classification scheme. Aside from the overall achievement of the DEP's goal to protect environmental resources, high rating of sites, and more DEP oversight may have

practical advantages. Clean up activities in or near resource areas such as wetlands and Areas of Critical Environmental Concern (ACECs) may require permits or environmental notice. All other things being equal in comparing sites, a permit for site clean-up, and eventually a consolidated environmental permit to address all concerns in resource areas could save the regulated community and the Commonwealth time and money in the long run. In addition the DEP and other regulatory agencies could use the potential environmental score section as a screening tool for potential damages to natural resources.

Work Group Recommendation: The proposed scoring system attributes 120 total points or 20% of the total possible score for ranking the potential environmental exposure of sites. The resources targeted for concern are ACECs, Endangered, Threatened or Special Concern Species, Wetlands and Fisheries. Each of these areas is important enough to be addressed by regulations of the Commonwealth to limit or control activities which might affect the resources. Comments are solicited on the level of importance given to potential environmental exposure in the proposed scoring system, as well as to the resources considered.

7. OTHER***

Issue: Should LSPs and PRPs be required to identify other miscellaneous site conditions?

Some members of the work group feel the Tier Classification system should require PRPs and LSPs to identify any other serious site condition which would warrant attention by the DEP, and hence a Tier I classification. For example, if oil or hazardous materials were mixed with wastes not regulated under 21E, such as biological or radiological wastes, the LSP and PRP should have the option of identifying this situation to the DEP for coordination with other agencies such as the Department of Public Health. Comments are solicited on this issue.

Issue: Should the numerical ranking system be used to evaluate imminent hazard and the need for a short term measure?

The work group recommends the proposed scoring system NOT be used to evaluate imminent hazard and the need for a short term measure. Instead the MCP rewrite group recommends a separate analysis for imminent hazard be required on a revolving basis, at all times by PRPs and LSPs, using generic criteria to be placed in the regulations. Such issues as vapors in basements which are not handled particularly well by the proposed scoring system, could be handled better in specific imminent hazard criteria. Comments are sought on this issue.

PROPOSED REVISION TO THE MASSACHUSETTS CONTINGENCY PLAN

DRAFT NUMERICAL SCORING SYSTEM FOR TIER CLASSIFICATION

JANUARY 27, 1992

BACKGROUND:

In order to classify sites as Tier I or Tier II, a proposed site scoring system has been developed which characterizes the threat and complexities of sites *relative* to one another. The proposed Site Scoring Sheet is composed of five sections to be filled out by the Licensed Site Professional (LSP). Section I of the scoring system includes basic information such as the site name, location, owner and LSP. The actual score a site receives is based on a combination of factors that are important to the Department in evaluating how serious a threat may be posed by a site. These factors include:

- Site Characterization Factors
- Contaminant Quantity, Toxicity, and Mobility
- Human Exposure Potential
- Environmental Exposure Potential

Each of these sections is comprised of site characteristics and contaminant related factors that are commonly used in determining the threat and complexity of contaminated sites. Each factor and characteristic category were commonly found in many of the other scoring systems reviewed by the Department while developing the proposed system. It is important to note that the combined factors included in the proposed scoring system provide a mechanism by which the Department can compare sites.

Site Characterization Factors

In the site characterization, four media are generally considered by the Department to reflect the potential threat that contaminants at the site pose to the environment and human receptors at or near the site. These four media are: soil, groundwater, surface water (including sediments and wetlands), and air. Evaluating the confirmed or potential presence of contamination in each of these four environmental media serves as an indicator of the severity of the contamination at a site.

In considering the four environmental media at a site, the DEP looks for certain site characteristics to help decide the priority of a site as follows:

- Sites generally receive higher priority based on the level of certainty that contaminants are or may be present within specified media. The presence of the contaminant(s) within environmental media may not be known, or may be confirmed. In order to prioritize sites with known contamination, sites with confirmed contamination (i.e., analytical data) receive higher site characterization scores than those with no known or potential contamination.

- In addition, an assessment of human exposure relative to the contaminants present in the environmental media allows the Department to characterize actual human exposure to contaminated media at a site as having a very high priority for action. This is especially true for known exposure to air contaminants.

- The existence of multiple sources of contamination serves to indicate the level of complexity that one site may pose relative to another. Many scoring systems require additional points be given to complex sites (i.e., more than one source) to ensure that the most complex sites receive an appropriate level of regulatory oversight.

Contaminant Quantity, Toxicity, and Mobility

The quantity, toxicity, and mobility of hazardous materials released at a site reflect the potential threats posed by the contaminants at the site. The relative threat of an individual contaminant can be characterized by assessing potential human or ecological toxicity in combination with the quantity of the chemical. The potential toxicity assessment assigns a higher priority to the sites with large quantities of highly toxic contaminants and a lower priority to sites with small quantities of contaminants with relatively low toxicity scores. It should be noted that most scoring systems take into account that small amounts of a highly toxic substance may pose less of a threat than large amounts of a less toxic substance. In addition, the presence of multiple contaminants with high toxicity is also considered more serious than sites with a single contaminant.

The mobility of a contaminant is another important factor in considering the potential threat posed by the contaminant. Theoretically, mobility of a contaminant is evaluated by a combination of the following factors:

- The physical state of the contaminant. Is it liquid, solid, or gas?

- A potential range of mobility. Does the contaminant move slowly or rapidly through indicated media? Is it aqueous or non-aqueous? How volatile is it? Will it bind to the soil or pass through?

- The permeability of the soil. Is the site clay or sandy? Does the soil restrict the mobility of the contaminant?

- The distance to the groundwater. Does the contaminant have the potential to enter the groundwater?

In addition, the Department may target chemicals which are known to pose a threat because they are frequently problems at the receptor. For example, many groundwater supplies are known to be contaminated by chlorinated volatile organics.

Human Exposure Potential

The potential for human exposure to site contaminant(s) via direct contact, inhalation, and ingestion is one of the most important ways for measuring the relative threat a site poses to public health. In the absence of exposure pathways to humans the public health threat of any given contaminant may be relatively small. To prioritize sites, human exposure potential is based on:

- Population density and characteristics of the population at and around the site. How many residents may be potentially exposed in the surrounding area? Are there any 'sensitive' populations to consider (e.g. schools, nursing homes, hospitals, day-care centers)? How may on-site workers are potentially at threat?

- The proximity of the site to drinking water sources or recreational surface water bodies. How many people may potentially drink or have direct contact with contaminated water? Is the drinking water source public or private? Is there a public recreation site or drinking water supply (reservoir) within close proximity? Is the site over a sole source aquifer where there is the potential for wider contamination through drinking water?

Environmental Exposure Potential

Finally, DEP and other regulatory agencies must take into account potential impacts to the environment from a site. Some factors to consider are Areas of Critical Environmental Concern (ACECs); critical habitats of plants or animals that are threatened or endangered, productive environmental areas such as inland or coastal wetlands, and resources such as fisheries and shell-fisheries.

In considering site characterization, contamination quantity, toxicity, and mobility, human exposure potential, and environmental exposure potential the Department must develop a comprehensive and efficient means of ranking sites relative to one another. The proposed site scoring system will allow for the classification of sites into either Tier I or Tier II. This classification system will assist in streamlining the process for cleaning up sites by allowing sites posing lower threats to proceed with less Department oversight. Moreover, the tier classification system, using the proposed site scoring system, provides the Department with a mechanism to achieve its goal of maximizing resources toward the protection of public health, safety, welfare and the environment from releases of oil and other hazardous materials.

PROPOSAL

The scoresheet would be completed by a Licensed Site Professional (LSP) on behalf of a responsible party. For sites where a responsible party has not been identified or where a responsible party is unable to initiate the remediation process, DEP could score the site.

The numerical ranking scoresheet would be completed on the basis of, at least, a Phase I -- Limited Site Investigation. Sites would be scored within one year following Site Notification.

The proposed scoresheet (Figure 1) is comprised of five sections, totaling 600 points:

I. Site Information - This section summarizes background information about the site such as site name, location, owner, and the responsible LSP. No points are assigned in this section.

II. Site Characterization - This section is designed to reflect the threats and impacts contaminants may pose to various environmental media and human receptors. A maximum of 150 points (25 % of the total score) may be assigned to this section.

III. Contaminant Quantity, Toxicity, and Volume - This section is designed to reflect the relative risks associated with a site based on the type, quantity, and mobility of hazardous materials which have been released. A maximum of 150 points (25 % of the total score) may be assigned to this section.

IV. Human Exposure Potential - This section is designed to assess the potential harm to human health and welfare by evaluating relative risk of direct contact, inhalation, and ingestion based on the nearby population (and presence of other sensitive human receptors) and local groundwater and surface water supply uses. A

maximum of 180 points (30 % of the total score) may be assigned to this section.

V. Environmental Exposure Potential - This section is designed to assess the potential harm to sensitive food chain members, plant and animal species, and habitats. A maximum of 120 points (20 % of the total score) may be assigned to this section.

A user's manual would be prepared to accompany the scoresheet and would provide specific guidance to the LSP including a list of physical/chemical/biological attributes for most common contaminants and directions for obtaining other information required to complete the scoresheet. The manual would also include requirements for supporting documentation, including specific worksheets that must be attached to the scoresheet submission.

I. SITE INFORMATION

Section I requires basic information on site location, ownership, operations, and the LSP.

- Site Number - The DEP-assigned site identification number would be reported, if such a number has been assigned.
- Site Name - The site name and location (latitude/longitude, UTM coordinates, and street address) would be reported.
- Site Owner - The current site owner, his/her address, and telephone number would be reported.
- Site Operator - The current site operator, his/her address, and telephone number would be reported, if applicable.
- LSP - The name, address, telephone number, and registration number of the LSP responsible for preparing the scoresheet would be reported. A signature and date of signature is also required.

The LSP must state whether the site has been designated as a Tier I site based on the site's location in a Critical Resource Area. This analysis would have been performed as part of Subpart C, Notification. Critical Resource Areas proposed may include any area contained within DEP approved Zone IIs or interim Zone IIs or a designated Sole Source Aquifer.

The LSP must state whether the site has been designated as a Tier I site because of the presence of an Imminent Hazard and if an Imminent Hazard is still present at the site.

The Workgroup will define at a later point what the nature and content of required supporting documents for the ranking form will

be. For now, it can be assumed that a Phase I equivalent report would be typical of the supporting information required.

II. SITE CHARACTERIZATION

The Site Characterization section evaluates the presence or absence of oil or hazardous materials in four media: soil, groundwater, surface water (including wetlands and sediments), and air. For each media, the presence or absence of a confirmed human exposure to media-specific contaminants is also scored. Scoring for each media would be based on definitive criteria, examples of which are shown in Figure 2. All four media must be scored.

Ten points would be assigned if there is the **slightest** potential *for the presence of a contaminant in a particular media.* If definitive criteria or analytical data cannot show that the "None" score is justified, the score for "Potential" would be required, as a minimum. If field or analytical data confirms the presence of a chemical in a particular media, 15 points would be assigned. This small point spread was thought to support the belief that the certainty of contamination obtained through field or analytical data deserves additional points, however, the point differential is not intended to be so large that a responsible party would be rewarded for delaying the site investigation.

Additional points are assigned if there is confirmed human exposure. For soil, groundwater, and surface water, 30 points are *assigned if there is confirmed human exposure. For air, 50 points* are assigned to account for the increased health risk associated with inhalation and the difficulty of determining health risks due to inhalation at a Phase I level investigation. Confirmed human exposure points in this section are intended as baseline measurements: Human exposure potential is examined in greater detail in Section IV.

Ten additional points would also be assigned in the Site Characterization section for sites with multiple sources, either on-site or from nearby sites. This is important in determining site complexity and thus the level of remedial difficulty.

III. CONTAMINANT QUANTITY, TOXICITY AND MOBILITY

Section III, Contaminant Quantity, Toxicity and Mobility, evaluates the relative threat posed by the site to public health and the environment. This section is divided into two, related subsections: Quantity and Toxicity, and Mobility. Three alternative methods are presented in the Quantity and Toxicity subsection. Estimates of quantity, toxicity, and mobility would be determined based on the "most hazardous material", i.e., the

chemical that has the highest combined quantity, toxicity, and mobility score.

Part A: Contaminant Quantity and Toxicity

Part A utilizes three scoring techniques to provide a Toxicity and Quantity Value for contaminants that are known to have been released or that have been detected during the site investigation. The Quantity and Toxicity Value is based on the Potential Toxicity Score (proposed as a function of reference dose and carcinogenic class) of each chemical at the site and the concentration or quantity of that chemical.

- Method 1 - would be scored for all sites. It is based upon highest detectable concentrations of site contaminants. Method 1 assumes knowledge of the site contaminants and the concentrations found in any media. The reportable concentration or more recent analytical data could be required here.

- Method 2 - would be scored only if both the type(s) of contaminants and the volume of contaminant(s) are known. Default values for commonly encountered vessels, lagoons, or disposal pits could be included in the guidance manual (e.g., assume 300 gallons for a residential UST).

- Method 3 - evaluates the site based upon the waste stream typically associated with a class of commercial operation believed to the source of the contaminants in relation to an estimated aerial extent of contamination.

Any contaminant volumes given in the Site Notification Form submitted to DEP could be used in scoring Section III, Method 2, unless further information developed in the Phase I site evaluation provides more accurate information. When both Methods 1 and 2 can be scored, the highest score would be used.

Methods 1 and 2 assign a possible Toxicity and Quantity Value of between 10 and 50. If more than one site contaminant has a Toxicity and Quantity Value that score higher than 30, 30 additional points would be added to the site score to take into account the greater potential danger of such a site.

Method 3 would be used only when neither specific contaminant identities nor concentrations or volumes are known. It is proposed as the least desirable of the Section III scoring techniques. Use of Method 3 results in doubled Toxicity and Quantity Values because of the uncertainty of the data. Justification for use of Method 3 could be included in a Site Classification Report.

See the attached Issues Paper for a discussion about the implications of scoring a site without analytic data.

Part B: Mobility

Part B evaluates the potential mobility of site contaminants based on: the physical state of the contaminant(s) and the potential mobility score, which could be a function of vapor pressure, solubility, octanol/water partition coefficient, or other appropriate factors.

The depth to groundwater and soil permeability would also be scored in this section. If the site is located in surface waters, 10 points would be scored for depth to groundwater/soil permeability. Other numeric soil permeability criteria would be provided in the guidance manual. If the depth to groundwater or soil permeability is not known, the maximum value would be used.

IV. HUMAN EXPOSURE

The Human Exposure section evaluates the potential for human exposure based on the site location, on-site activity, and nearby land and water uses. The population and water use estimates are indicators of the potential for exposure from direct contact, inhalation, and, depending on local groundwater and surface water use, ingestion.

Part A: Population

The LSP would report the residential population within one-half mile of the site and determine if any populations that are particularly susceptible to environmental health problems (e.g., schools, day care centers, hospitals, and nursing homes) are present within that same target area. In addition, if the site is active, the LSP would report the number of workers on-site.

Part B: Water Use

Contamination of drinking water supplies are a major DEP concern and are thus a significant focus of the scoresheet. Several factors are of concern related to water use. Potential contamination of a sole source aquifer is believed to be a sufficiently high concern as to rate 25 points regardless of the site's proximity to a water supply wellhead or intake.

The LSP must also determine if the site is located within the zone of contribution of a public water supply wellhead or intake, the watershed of a wellhead or intake, or within surface waters

classified as drinkable. If a site is located within the zone of contribution of a public water supply wellhead or intake (i.e., within the boundaries of a Zone II or 400 feet from a reservoir serving a surface water intake), the number of persons served by that public water supply must be determined. The potential for contamination of a major, public water supply is of sufficient concern that, for example, a site within 400 feet of a major surface water reservoir would score 75 points, because proximity (50 points) and serving more than 50,000 people (25 points) would be added together.

Proximity to private water supplies raises other concerns. Private water supplies generally have much smaller drawdown areas than public water supplies, thus the target area for determining the private water supplies near a site is reduced to 500 feet. In certain areas in the state, a site may be located within the Zone II of a public water supply and 500 feet of a private water supply.

Private water supplies may be used for a number of purposes, besides drinking water. If a site is located within 500 feet of a private well that is used for drinking or food processing, 25 points would be scored for this category. However, if the well water is used only for irrigation, the potential human health hazard is lower and thus only 15 points would be scored.

Surface water supplies are often used for recreational purposes as well. There is potential for incidental dermal contact through such activities as boating, extensive dermal contact through swimming, and ingestion of contaminated foods through fishing. Up to 15 additional points may be scored if there are surface waters located within one-half mile of the site and these surface waters are used for recreational purposes.

V. ENVIRONMENTAL EXPOSURE POTENTIAL

Releases of oil or hazardous materials can have adverse effects on many environmental resources. Particularly important are those resources are which especially sensitive such as Areas of Critical Environmental Concern (ACECs) and plant and animals that are of special concern, threatened, or endangered. Uniquely productive resources such as inland and coastal wetlands, fisheries and shellfisheries would also require scoring.

- ACEC - An ACEC is a formal designation made to protect natural areas of regional or statewide significance. ACEC boundaries are available from the Coastal Zone Management (coastal ACECs) and the Division of Resource Conservation, Department of Environmental Management (inland ACECs). The ACECs are established in regulations.

- Special Concern, Threatened and Endangered Species - The LSP would report all special concern, threatened, and endangered species, as defined in 321 CMR 8.00, near the site. However, because of staff limitations within the Natural Heritage Program, the search may be limited to critical habitats for wetlands wildlife, maps for which are available at DEP regional offices.

- Wetlands - The presence of both inland and coastal wetlands would be evaluated based on maps available from DEP's Conservancy Program (preferably) or the National Wetlands Inventory (if Conservancy Program maps are not available).

- Fisheries - This includes any body of water that is used for commercial or recreational fishing or shellfishing. The entire coastline of Massachusetts is considered as a fisheries as is any inland surface water body that is used for recreational fishing.

The target area for each of these resources varies from one-half mile to 100 feet for wetlands and fisheries.

Points for each environmental resource category are additive, thus a site within 100 feet of an a coastal estuary that is a ACEC and is used for fishing would score 90 points. However, a site within 100 feet of a coastal estuary that is used for fishing but is not a designated ACEC, would only score 40 points.

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
SITE RANKING SCORESHEET

I. SITE INFORMATION

DEP Site Number _____

UTM Coordinates _____ _____

Latitude _____ Longitude _____

Site Name _____ Site Owner _____

Address _____ Address _____

_____ _____

_____ _____

Telephone _____

Licensed Site Professional Site Operator _____

Name _____ Address _____

Address _____ _____

_____ _____

Telephone _____

Telephone _____ LSP Signature _____

Registration Number _____ Date _____

Was the Site designated as a Tier I based on the Critical Resource Area analysis? No Yes

Was the Site designated as Tier I because of an Imminent Hazard? No Yes

Does the Site still present an Imminent Hazard? No Yes

II. SITE CHARACTERIZATION

MEDIA	NONE/NA	POTENTIAL	CONFIRMED PRESENCE	CONFIRMED HUMAN EXPOSURE
Soil	0	10	15	30
Groundwater	0	10	15	30
Surface Water and Sediments (includes wetlands)	0	10	15	30
Air	0	10	15	50

Multiple Sources	No 0	Yes 10

Category Sub-Score _____

III. CONTAMINANT QUANTITY, TOXICITY AND MOBILITY

A. QUANTITY AND TOXICITY VALUE

METHOD 1 - Identified Chemical/Known Concentration

CHEMICAL CONCENTRATION (parts per billion)	POTENTIAL TOXICITY SCORE				
	<5	5 - 19	20 - 29	30 - 39	40 - 50
1 - 99	1	5	10	15	20
100 - 999	10	15	20	25	30
1,000 - 9,999	20	25	30	35	40
≥ 10,000	30	35	40	45	50

Contaminant and concentration on which site toxicity was based: _____

More than one contaminant having a Quantity and Toxicity Value of ≥ 30	No 0	Yes 30

METHOD 2 - Identified Chemical/Known Release

CHEMICAL QUANTITY		POTENTIAL TOXICITY SCORE				
(pounds)	(gallons)	<5	5 - 19	20 - 29	30 - 39	40 - 50
< 440	< 55	1	5	10	15	20
440 - 3,399	55 - 549	10	15	20	25	30
4,400 - 43,999	550 - 5,499	20	25	30	35	40
≥ 44,000	≥ 5,500	30	35	40	45	50

Contaminant and quantity on which site toxicity was based: _____

More than one contaminant having a Quantity and Toxicity Value of ≥ 30	No 0	Yes 30

METHOD 3 - Unidentified Chemical/Estimated Extent of Contamination

QUANTITY OF WASTE		WASTE CLASS			
(cubic feet)	(acres)	A	B	C	D
< 500	< 0.50	10	20	30	40
500 - 4,999	0.50 - 0.99	30	40	50	60
5,000 - 24,999	10 - 59	50	60	70	80
≥ 25,000	≥ 60	70	80	90	100

Waste class source on which waste characterization was based: _____

B. MOBILITY

Physical State	Solid 0	Liquid/Sludge 5	Gas 10
Potential Mobility	Low 0	Medium 15	High 30

DEPTH TO GROUNDWATER (in feet)	SOIL PERMEABILITY		
	Low	Medium	High
> 150	1	2	4
> 75 - 150	2	4	6
> 15 - 75	4	6	8
0 - 15	6	8	10

Category Sub-Score _____

IV. HUMAN EXPOSURE POTENTIAL

A. POPULATION

Residential Population Within 1/2 Mile	None *0*	1 - 99 *5*	100 - 999 *10*	≥ 1,000 *15*
Institutions Within 1/2 Mile	None 0		One or More 10	
On-Site Workers	None 0	1 - 99 5	100 - 999 10	≥ 1,000 15

B. WATER USAGE

Sole Source Aquifer Name:_____	No 0	Yes 25

Proximity to Public Drinking Water Supply	Class B or C 0		Class A 5	Zones III or A 10	Zone II or < 400' of reservoir 50
Persons Served by Public Drinking Water Supply (Score only if within Zone II or < 400' of reservoir)	NA 0	1-999 5	1,000 - 4,999 10	5,000 - 49,999 20	≥ 50,000 25
Private Water Supplies Within 500 Feet	NA 0	*Non-Contact* Commercial Industrial 5	*Contact* Commercial Industrial 10	*Contact* Agriculture/Aquaculture Residential Non-Drinking 15	*Drinking* Food Processing 25

Recreationally Used Surface Water	> ½ Mile From Site 0	≤ ½ Mile From Site 15

Category Sub-Score _____

V. ENVIRONMENTAL EXPOSURE POTENTIAL

Areas of Critical Environmental Concern	ACEC > ½ Mile From Site 0		ACEC ≤ ½ Mile From Site 25	Site is Within ACEC 50
Special Concern, Threatened, and Endangered Species	> ½ Mile From Site 0		≤ ½ From Site 30	
Wetlands (Inland or Coastal)	> 500 Feet From Site 0	> 100 - 500 Feet From Site 10	≤ 100 Feet From Site 15	On-Site 20
Fisheries	> 500 Feet From Site 0	> 100 - 500 Feet From Site 10	≤ 100 Feet From Site 15	On-Site 20

Category Sub-Score _____

SITE SCORE II. _____ III. _____ IV. _____ V. _____ **TOTAL** _____

EXAMPLES OF THE TYPE OF CRITERIA THAT COULD BE SET FOR A SITE SCORING SYSTEM
SITE CHARACTERIZATION SECTION SUMMARY

MEDIA	None or Not Applicable[1]	Potential Presence	Confirmed Presence	Confirmed Human Exposure
Soil	Release to surface water only or analytical data showing ND[2]. SCORE 0	Knowledge of release; stained soils; distressed vegetation; or odors. SCORE 10	Analytical data; headspace PID, FID or GC; soil gas PID, FID or GC. SCORE 15	Hazardous substances at the soil surface and the site is accessible or efforts to restrict access have been unsuccessful. Fencing alone is not sufficient to deny exposure if there is evidence of trespass. SCORE 30
Groundwater	Impermeable layer ($\leq 10^{-7}$ cm/s) between contaminants and groundwater or contaminants bound strongly to soils a ($K_{ow} \geq 10^4$) or analytical data showing ND. SCORE 0	Knowledge of a release or visible sheen on groundwater surface. SCORE 10	Analytical data; headspace PID, FID or GC. SCORE 15	Laboratory analysis of samples from well or tap. Negative findings as a result of placement of filtration systems or provision of alternate supplies is not sufficient cause for denying exposure. SCORE 30
Surface Water	No surface water bodies within ½ mile of site or analytical data showing ND. SCORE 0	Knowledge of a release; visible sheen or discoloration; observed leachate or contaminated. groundwater entering surface water; or stained soils in contact with surface water. SCORE 10	Analytical data; headspace PID, FID or GC; or documented fish-kill attributable to the site. SCORE 15	Bathing beach abutting surface water with confirmed contamination; fish advisory attributable to the site; or laboratory data at entry point to drinking water distribution system. Negative findings as a result of placement of filtration systems or provision of alternate supplies is not sufficient cause for denying exposure. SCORE 30
Air	Sub-surface discharge (≥ 12 inches) of contaminants with low vapor pressure of (≤1 mm Hg) or analytical data showing ND. SCORE 0	Knowledge of release; open container or surface impoundment containing volatile compounds (vapor pressure > 1 mm Hg); odor; surficial presence of volatile compounds (top ≤ 12 inches); observed emission of dust or particulate matter from a known contamination area; observed vapor cloud emanating from a containment structure or contaminated area; or visible breakout of contaminants to confined space. SCORE 10	Analytical data; PID, FID or GC; detector tubes; or combustible gas and oxygen meters. SCORE 15	Detection of airborne contaminants on-site or within 100 feet of a residence or institution (school, day care facility, hospital, or nursing home). SCORE 50

[1] If criteria for "None" or "Not Applicable" cannot be met, the scorer must use the assume "Potential Presence", at a minimum.

[2] ND is defined as "Not Detectable".

PROPOSED REVISION TO THE MASSACHUSETTS CONTINGENCY PLAN

SUBPART C: SITE CATEGORIZATION

ISSUES PRESENTATION AND DISCUSSION

January 27, 1992

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This discussion paper considers issues related to the proposal to incorporate a **Site Categorization** step into Subpart C of the revised MCP process. This step would be inserted into the MCP between the **Release Notification** and **Tier Classification** components of the model. For sites that qualify, Site Categorization would provide PRPs with regulatory alternatives to the MCP's full multi-phase Subpart E site assessment and remedial action process.

The intent of this paper is to outline the proposal as it has been developed to date, evaluate this approach, and identify potential issues and problems related to its implementation.

Background

Site Categorization was proposed, in part, to address the concern that the "broad net" cast by the proposed Release Notification regulations will bring a wider range and increased number of sites into the MCP process. In absence of some intermediate step between Notification and Tier Classification, all releases reported to the Department could become subject to the MCP's Subpart E assessment and remedial action process. Subpart E involves several phases of investigation that can take several years to complete. Many share the view that while the multi-phase Subpart E process makes sense for more complex sites, it is unnecessarily demanding or otherwise inappropriate for certain types of sites that will be reported to the Department under the Release Notification regulations.

The Site Categorization component could provide potentially responsible parties (PRPs) with access to alternatives to the Subpart E regulatory track for certain sites that qualify. For example, under the current proposal, all of the sites in the 21E universe would be segregated, through the application of specific criteria, into the following categories of sites: lead contaminated soil sites, construction sites, removal sites, and disposal sites. Categorization would be performed by a Licensed Site Professional (LSP) hired by the PRP. Only those releases identified as "disposal sites" would undergo Tier Classification and be regulated under Subpart E. Response actions for releases that meet the

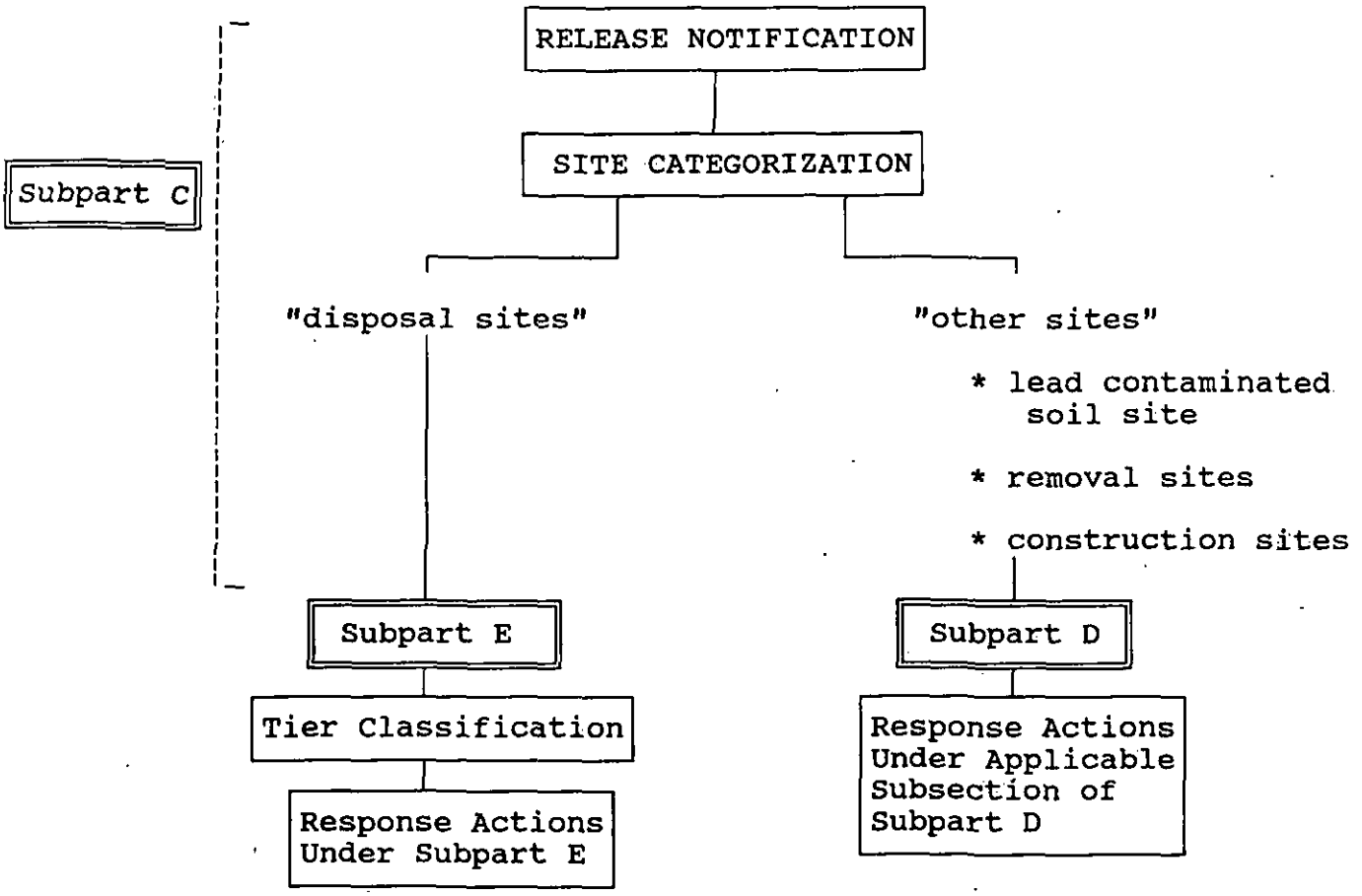
criteria for any of the other site categories would be outlined in category-specific subsections of Subpart D.

Through site categorization, releases entering the system would be directed to the site management category that best reflects the nature and extent of the contaminant conditions. Separate regulatory requirements and guidance would be developed to suit the special management issues (i.e., assessment considerations and remedial alternatives) related to the different site categories.

In general terms, Site Categorization would provide the regulated community with a better understanding, at the front end of the system, of the type of contamination problem they have and the regulatory requirements that apply to their site. As the proposal has evolved, a number of additional objectives, such as defining programmatic lines and identifying sites for public listing, have been tied to Site Categorization.

The basic scheme for incorporating a Site Categorization step into Subpart C of the revised MCP is presented in Exhibit A below:

Exhibit A



Site Categories

The site categories currently under consideration are as follows --

"Lead Contaminated Soil Sites": would encompass residential, commercial & industrial sites where lead is the exclusive or primary contaminant of concern;

"Removal Sites": sites where contamination is localized and amenable to a "quick-fix";

"Construction Sites": sites where construction activities are proposed by a non-PRP at a release location, i.e., construction in "urban brown areas"; installation of subsurface utilities and roadways in contaminated areas.

"Disposal Sites": all other sites in the 21E universe. These releases would be classified as either Tier I or Tier II sites.

Hierarchy of Site Categories

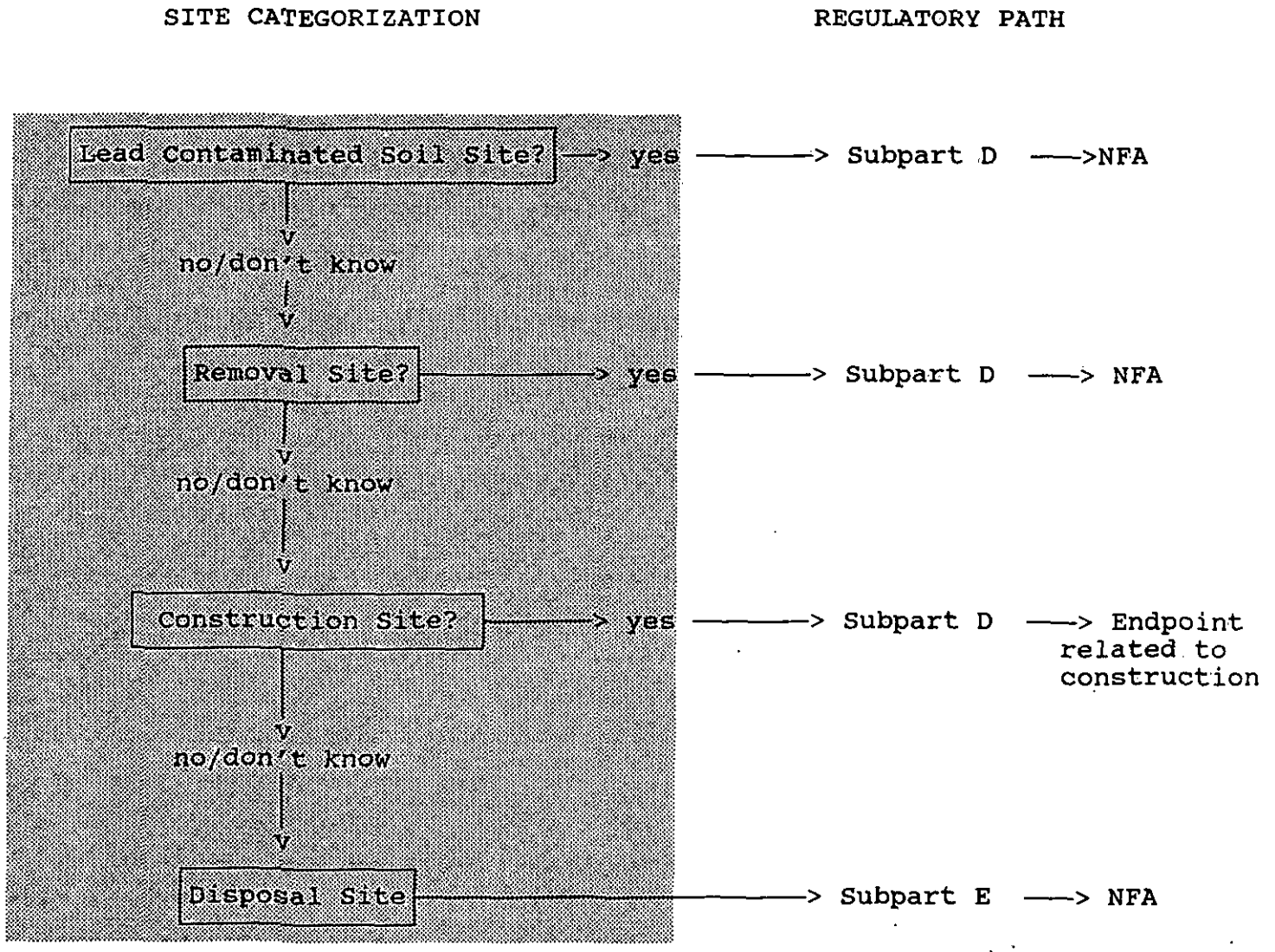
A hierarchy would be established for the purpose of segregating releases into the appropriate site category. As currently proposed, the first category in the series would be Lead Contaminated Soil Sites, followed in order by Removal, Construction, and Disposal Sites. A site that clearly met the criteria for a Lead Contaminated Soil Site would be categorized as such. Otherwise, it would be evaluated in turn against the criteria of the other categories, until a match was made. A release that did not meet the criteria of any of the first four categories would, by default, be a Disposal Site.

The use of a hierarchy avoids the confusion that would be created by a release that meets the criteria of more than one category. The Disposal Site category serves as a "catchall" for all releases that do not fit into any of the previous categories in the hierarchy, eliminating the possibility of site stalling in the categorization process. Site Categorization is an option for PRPs. That is, it is not absolutely necessary for a PRP to categorize his site. However, if he chooses to forego this step, the site would by default be a Subpart E "Disposal Site".

Exhibit B on the following page presents the hierarchy of site categories in the context of the categorization process.

Exhibit B

CATEGORIZATION PROCESS



Criteria for the Site Categories

The successful implementation of the Site Categorization scheme is dependent upon the development of specific and workable criteria for each of the site categories, with the exception of Disposal Sites. Because "Disposal Sites" is the default category, additional criteria for this group of sites beyond what exists in the MCP today are unnecessary.

It has been proposed that the criteria developed for each of the site categories be inclusionary. That is, if contaminant conditions fall within the boundaries of the set of conditions outlined for a particular site category, then the release meets the criteria for that category.

Because Site Categorization is proposed for the front end of the MCP process, the categorization decision will have to be based upon the amount of information that is available early on in a release investigation. It has been suggested that the Site Categorization decision be supported by a level of study and documentation equivalent to a "Preliminary Assessment". The criteria for defining the different site categories, therefore, would reflect the limited degree of information gathered in a Preliminary Assessment.

Development of the specific criteria for the different site categories is currently underway. In the event that the criteria for any of the non-disposal site categories have not been finalized by the time the program redesign goes into effect, releases belonging to those site categories would default to Subpart E "Disposal Sites". A detailed discussion of the criteria will be presented in a subsequent paper. General ideas and issues which have been discussed to date with respect to the form and scope of the different site categories are outlined below.

LEAD CONTAMINATED SOIL SITES

This category was proposed to address the special management concerns at sites with widespread soil contamination by lead and other constituents for which no discrete source can be identified. These kinds of sites are frequently encountered in urban/industrial settings and in cases where soil from urban/industrial areas has been used as fill material. The lead contaminated soil category would include locations where the reportable concentrations of oil/hazardous materials found in surface and subsurface soils are limited exclusively or primarily to lead. This category could encompass sites in residential, commercial and industrial settings.

This category could be extended to include other contaminants commonly associated with lead in soil (i.e., arsenic, barium, cadmium, zinc and petroleum hydrocarbons) that are found along with lead at reportable concentrations. Threshold values could be established for other contaminants found with lead. Sites where the threshold concentrations were exceeded would be ineligible for

the Lead Contaminated Soil Site pathway.

To date, the following issues have been raised with respect to the Lead Contaminated Soil Category:

21E Exemptions of Soils Contaminated by Lead from Paint Residues & Engine Exhaust

The definition of "disposal site" under M.G.L. chapter 21E excludes "any site containing only oil or hazardous materials which are lead-based paint residues emanating from a point of original application of such paint; [and] resulted from emissions from the exhaust of an engine". These sites, therefore, cannot by definition be handled as disposal sites under Subpart E. Lead from automobile emissions are also excluded under the statute's definition of a "release". Lead paint sites, however, are not and therefore are subject to the Release Notification regulations and MCP response actions requirements.

Because lead paint releases are subject to the notification regulations, the BWSC has the statutory authority to regulate response actions at lead paint sites, as long as these sites are not managed as "disposal sites". The lead contaminated soil site category provides a mechanism for identifying and managing these locations under Subpart D. It has been suggested that the Bureau could also group lead emission sites with lead paint sites by arguing that it is not possible to ascertain the source of the elevated lead levels in soil, and therefore it will be assumed in every case that the source is lead-based paint. We question whether this position is defensible, i.e., whether it is indeed impossible or impracticable to distinguish between lead from paint and lead from exhaust. If this is the case, then the Department will have an opening for extending the protection of public health and the environment provided by the statute to lead exhaust sites. **Comments are sought on this issue.**

Sites where the source of the lead is not paint residue or auto exhaust (i.e., lead contamination at smelters, firing ranges or orchards), are not exempt from the definition of disposal site. These sites therefore could be excluded from Lead Contaminated Soil Category and managed as disposal sites under Subpart E. Alternatively, all sites where the primary contaminant is lead and the release is limited to surface and subsurface soils, could be categorized as Lead Contaminated Soil Sites. The advantage to this approach is that all lead contamination sites, regardless of source, would be managed according to the same subsection of Subpart D which specifically addresses the assessment and remediation of lead in soils. **Comments are sought on this alternative.**

Regulatory Relationship between the BWSC and DPH with respect

Lead Contaminated Soil Sites

A major issue with respect to the proposal to manage lead contaminated soils under Subpart D is the relationship between Subpart D requirements for these sites and the "Lead Contaminated Soil Remediation and Cover Regulations" (310 CMR 43.00) currently being developed by a joint DEP/DPH task force. These regulations address the assessment and remediation of soils at residential properties "containing dangerous levels of lead" . As currently drafted, dangerous lead levels in soil are defined as: (a) soil that poses a danger to a child under six years of age who is at significant risk of lead poisoning or re-poisoning; and (b) soil containing 1,000 parts per million (ppm) or greater of lead.

The scope and specific criteria (i.e., action levels and remedial options) set forth in these DEP/DPH regulations are of direct relevance to the discussion of Subpart D response actions at Lead Contaminated Soil sites. Several alternatives exist for defining the relationship between lead sites under the MCP and residential lead sites under 310 CMR 43.00. One approach is to limit the scope of Lead Contaminated Soil Sites to commercial and industrial properties, leaving residential lead sites to be managed as Adequately Regulated Sites under the DEP/DPH regulations. A second approach is to effectively "overwrite" 310 CMR 43.00 by specifying that the Lead Contaminated Soil category applies to residential locations. A third possibility would be to expand 310 CMR 43.00 to address commercial/industrial as well as residential properties.

Considerably more information on the background, objectives (i.e., risk management and cost considerations) and the technical/scientific basis of the DEP/DPH regulations is needed before any informed discussion of this issue can occur. Resolution of this issue is necessary, independent of whether the BWSC adopts the Site Categorization proposal. The MCP Rewrite group should pursue this issue with the joint DEP/DPH task force.

REMOVAL SITES

The Removal Sites category would include less complex sites with localized contamination from a discrete source. Contaminant conditions at these sites can be adequately characterized by a limited investigation (i.e., Phase I level of study) and addressed by "quick-fix" remedial alternatives (i.e. on-site/off-site soil treatment or disposal). Removal Sites are roughly equivalent to the current programmatic definition of "Spills" that are handled by Emergency Response staff. In addition, the Workgroup is proposing that homeowner heating oil tank leaks be categorized as removal sites.

It has been suggested that Removal Sites be defined in terms of: (1) volume of contamination; and (2) time needed to achieve a No Further Action endpoint. Volumetric caps for soil removal could be proposed to limit removal actions. This would prevent PRPs from

attempting to avoid Subpart E by categorizing their property as a Removal Site and removing excessive volumes of contaminated soils under Subpart D. The volume of contaminated soil could be set at 500 cubic yards, consistent with guidance in the BWSC's "Petroleum Policy - Site Investigation Protocol Document."

A one year time limit, from the date on which the release is classified as a Removal Site, could be set for the completion of removal actions and the filing of a No Further Action decision. If removal actions cannot/are not completed within this time frame, the site would automatically be classified as a Disposal Site. Future response actions would then be performed under Subpart E. A removal action would not be considered complete and a NFA determination could not be made until stockpiles of contaminated soil and other physical hazards related to excavation activities were removed from the site. This approach would provide PRPs with added incentive to complete response actions in an expeditious manner and remove stockpiles, equipment, etc. that tend to linger on-site.

CONSTRUCTION SITES

The "Construction Sites" category was created to address the management of contaminated media at construction sites. The intent of this category is to allow non-PRPs that have prior knowledge of contaminant conditions or encounter contamination during construction and maintenance activities, to conduct appropriate response actions without having to proceed through the phased MCP process. The applicable subsection of Subpart D would provide construction contractors with guidelines on the management of contaminated materials at construction sites. This guidance would provide specific information on topics such as contingency planning, sampling/analysis, excavation and disposition of contaminated soil, and required DEP approvals.

The criteria for this category would address such issues as: (1) whether the applicant/notifier is a non-PRP (not responsible under chapter 21E for the contamination at the site); (2) whether construction activities could be performed without precluding future remedial response actions at the release location; and (3) whether construction activities could be performed in a manner that would not exacerbate contaminant conditions or otherwise pose a risk of harm to public health, safety, welfare or the environment.

DISPOSAL SITES

"Disposal Sites" would include all Tier I (A,B & C) and Tier II sites. Because Disposal Sites is the default category under the site categorization hierarchy, specific criteria for this category of sites are unnecessary. This category could be defined as "Any release that does not meet the criteria of Lead Contaminated Soil, Removal or Construction Sites shall be deemed a Disposal Site."

No Further Action (NFA) Endpoints and Standards of Risk

With the exception of possibly construction sites, a No Further Action (NFA) determination could be obtained in each of the site categories (see Exhibit B, "Categorization Process"). Under the current proposal, all other site categories would have to meet the same risk management standard to achieve an NFA (i.e., the NFA criteria applied to disposal sites would be consistent with the NFA criteria set forth for removal and lead paint sites).

At construction sites, the Subpart D endpoint could be achieved once the construction contractors have completed activities involving oil/hazardous materials and restored the site, such that contaminant conditions are no worse than before construction. Completion of construction activities under Subpart D would not release responsible parties from further response actions under the MCP.

LSPs Use at Subpart D sites.

At this point in time, LSPs are proposed to be required for any 21E response actions. Therefore, it is assumed that LSPs would be required to conduct response actions at Subpart D sites, i.e. at removal, construction and lead contaminated soil sites. They are not required to be involved in any other DEP programs assessment/response activities. **Comments are sought on this issue.**

Proposed Objectives and Benefits of Site Characterization

Defining of Programmatic Lines

Since the inauguration of the MCP, the BWSC has grappled with the problem of distinguishing releases that belong under Subpart E from those that are more appropriately handled under a different process or authority. The perennial "sites v. spill" issue within the BWSC concerning the programmatic line between Subpart E and emergency response actions is one example of this problem. The BWSC has attempted to delineate the boundaries of Subpart E by providing guidelines and drafting agreements that define the types of releases that are subject to the phased MCP process. Despite such efforts, the boundary lines in many cases are still unclear. By providing a single process and specific inclusionary criteria for distinguishing Subpart E "disposal sites" from other types of sites, Site Categorization has the potential to resolve many of the lingering jurisdictional issues related to the MCP, and Subpart E, in particular.

Listing

Differentiating "Disposal Sites" from other types of sites can also help define which sites must be listed. Among the proposed amendments to MGL chapter 21E, Sections 3(b)(5) and 3(d) have been identified as providing the Department with the ability to use site

categories to narrow the number of publicly listed sites. That is, the public list can be limited to include only "Disposal Sites" if a means of discerning disposal sites from other releases exists and is used.

Without a system such as site categorization, every release would have to be publicly listed. This result would be contrary to one of the stated objectives of the MCP redesign proposal-- to limit the scope and number of releases on the published sites list.

The Disadvantages of Site Categorization

While Site Categorization has been characterized as a means of providing a more "customized" regulatory fit for sites entering the 21E universe under the notification regulations, there are certain "costs" of customizing the MCP to be shared by the Department and the regulated community. One cost or disadvantage of Site Categorization is that its incorporation into the MCP increases the complexity of the model and regulations. Additions to Subparts C and D of the MCP will be required to implement Site Categorization (site categorization will be addressed in Subpart C and the response actions for all non-disposal site categories will be contained in Subpart D). PRPs/LSPs will be required to submit documentation similar in scope and format to the existing DEP "Preliminary Assessment" to support their Site Categorization determination.

Since categorization will be performed by LSPs, its incorporation into the MCP model creates an additional audit point. Adding categorization to the list of decisions/submittals to be audited could mean that more BWSC resources would be needed for the auditing process or the diversion of resources from other MCP auditing tasks.

Are There Alternative Approaches?

As an alternative to using site categorization as proposed, the inclusionary criteria could be used for a more limited set of objectives. For example, one could argue that Subpart E under the proposed program redesign will be flexible and less onerous than it once was. The new MCP model provides many opportunities throughout the process to achieve a No Further Action endpoint. In addition, the MCP permitting will allow PRPs to undertake Subpart E response actions as soon as they want, and, except in the case of Tier IA sites, to perhaps proceed as fast as they choose. Given the proposed revisions to the MCP, is there really a need to provide regulatory alternatives to Subpart E through the categorization mechanism? Is there in fact a substantial difference between an emergency response type response that would be taken at a "Removal Site" and a Subpart E response taken at a "Disposal Site"?

Are there other alternative Site Categorization approaches

that should be considered? For example, sites could be separated into fewer categories, such as lead contaminated soil and construction sites. Removal sites/all other sites would be subject to Subpart E. This would allow for some narrowing the field of listed sites and/or it could effect the assessment of annual compliance fees. **Comments are sought on this issue.**

What Type of Oversight Should be given to Subpart D Sites?

Under the proposed site categorization process, sites that qualify for response actions under Subpart D would not be subject to Tier Classification and permitting processes that are intended to help identify sites that require some level of DEP oversight. At this point, the question has been raised as to whether there should be some screening mechanism for Subpart D sites, similar to Tier Classification, to identify those releases that may require Department oversight or permitting. Such a process may be needed particularly for those Subpart D sites that would otherwise be Tier I sites because of their ranking or location in a "Critical Resource Area" (CRA). Should DEP have some level of review of response action proposals for Subpart D sites that would otherwise be Tier I sites? In general, what type of DEP oversight, if any, should be given to site in the Subpart D response categories? **Comments are sought on this issue.**