



Department of Environmental Conservation

Division of Fish and Wildlife

**Fish and Wildlife
Impact Analysis
for
Inactive Hazardous Waste
Sites
(FWIA)**

October 1994



New York State Department of Environmental Conservation
MARIO M. CUOMO, Governor LANGDON MARSH, Commissioner

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

DIVISION OF FISH and WILDLIFE

**Fish and Wildlife Impact Analysis for Inactive
Hazardous Waste Sites**

(FWIA)

October 1, 1994

More than 900 inactive hazardous waste sites exist in New York State. Article 27 of the Environmental Conservation Law gives the Department responsibility for remedial programs at these sites. This responsibility includes determining the nature of the danger to the environment posed by hazardous waste at the sites.

This document provides guidance for biologists who are gathering fish and wildlife information for assessing the danger to the environment at inactive hazardous waste sites. The information will be used by the Division of Fish and Wildlife to evaluate present and potential ecological impacts and to make recommendations for site remedial programs.

Original signed

Kenneth F. Wich
Director
Division of Fish and Wildlife

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Introduction

The objective of this document is to provide guidance for evaluating ecological impacts in areas contaminated with hazardous waste. It is intended for use by biologists both inside and outside the New York State Department of Environmental Conservation who assess hazardous waste site impacts. It is also intended for use by others involved in planning the scope of work required for site investigation and remediation.

The document presents an overview of the impact assessment process while detailing the requirements for specific information where appropriate. It is written in steps that include decision points for determining when the process is complete and further assessment is unnecessary. Appendix C provides a diagrammatic presentation of the entire process showing where decisions occur. Appendix D is a quick reference checklist of necessary items to be considered in the Fish and Wildlife Impact Analysis (FWIA).

The FWIA is intended for implementation at each hazardous waste site in New York State during the remedial investigation and feasibility study phases. The site-specific analysis developed using the FWIA will guide the Division of Fish and Wildlife in deciding when, where, and to what extent remediation is warranted for the protection of biotic resources.

Step I - Site Description

Objectives and Scope

The objectives of Step I are: (1) to identify the fish and wildlife resources that presently exist and that existed before contaminant introduction, and (2) to provide information necessary for the design of a remedial investigation. Maps, site descriptions, and resource descriptions are used to identify possible pathways of contaminant migration affecting fish and wildlife. Information obtained during Step I will be used to select the media of concern and the locations to be sampled during the remedial investigation.

Information from Step I is more useful when provided before the work plan stage of the remedial investigation. If available early in the process, it can be used to determine the need for additional ecological investigation, including field sampling. Early identification of the need for ecological studies will allow their incorporation into the overall design, helping to avoid additional phases of work.

Applicable fish and wildlife regulatory criteria, including Applicable or Relevant and Appropriate Requirements (ARAR's), Standards, Criteria, and Guidance (SCG's), and To Be Considered (TBC's), should be identified in order to assess site-related contamination and to determine remedial objectives. These criteria are used to identify contaminant impacts to fish and wildlife, and to evaluate contaminant-specific and site-specific ecological effects associated with proposed remedial alternatives. Consequently, criteria should be determined after contaminants and resources have been identified but before assessing a contaminant-specific impact in the remedial investigation and before evaluating remedial alternatives in a feasibility study.

A complete site description as outlined in Step I is necessary for sites with fish and wildlife resources that may be affected by site-related contaminants. However, if no resources are associated with the site or if there is no potential for contaminant migration to the resources, then only the necessary

information to support that conclusion should be provided. The information must, however, be definitive evidence of such conditions. If any doubt exists, Step I must be undertaken.

A. Site Maps

1. Topographic Map - A topographic map covering the area within two miles of the site perimeter must be provided. It should clearly depict:

- a) the location of the site
- b) the site perimeter, clearly defined
- c) documented fish and wildlife resources including, but not limited to:

- NYSDEC Significant Habitats as defined by the NYS Natural Heritage Program (Ecological Communities of New York State, 1990)
- habitats supporting endangered, threatened, or rare species, or species of special concern
- regulated wetlands
- wild, scenic and recreational rivers
- significant coastal zone areas
- streams and lakes

If major resources that may be affected by site-related contaminants exist farther than two miles downstream of the site, a topographic map indicating the location of these resources should be included. Maps should have a scale of 1 inch equals 2000 feet.

2. Covertypemap - A covertypemap should be drawn for the site and the area within 0.5 miles from the perimeter of the

site (suggested scale: one inch equals 500 feet). The base map may be derived from such sources as aerial photos, ground-level photos, USGS topographic maps, or soil maps. Major vegetative communities including wetlands, aquatic habitats, NYSDEC Significant Habitats, and areas of special concern should be shown. The NYSDEC Natural Heritage Program descriptions and classifications of natural communities may be used to identify the covertypes (Ecological Communities of New York State, NYSDEC, 1990). Any unique covertypes not described by the Natural Heritage Program should be identified and mapped. If the map is drawn from secondary sources (e.g. aerial photos, descriptions from the literature), covertypes and vegetative species should be verified by field checking. All covertype identification should be supervised by a qualified biologist.

3. Drainage map - A drainage map clearly depicting surface flows after hydrological events must be provided.

The topographic, covertypemap, and drainage maps must show the perimeter of the site. Maps should be drawn to a scale that permits features to be easily read. Copies **must** be legible.

B. Description of Fish and Wildlife Resources

1. Fish and Wildlife Resources and Covertypes - Fish and wildlife resources must be described. The description of aquatic resources should include chemical and physical parameters such as water chemistry, temperature, dissolved oxygen, depth, substrate composition, discharge, flow rates, gradients, streambed morphology and any other significant characteristics. Submergent aquatic vegetation should be identified and its abundance and distribution described. Wetland and stream

classifications should be included. For covertypes, typical vegetative species and their abundance, distribution, and density should be described. NYSDEC, USEPA, US Fish and Wildlife Service, local bird clubs, colleges, etc., may serve as sources of information to supplement field data (Appendix A).

2. Fauna Expected Within Each Covertypes and Aquatic

Habitat - The typical fish and wildlife species expected for each covertypes and aquatic habitat should be determined. Endangered, threatened, rare species, and species of special concern should be noted. Other sources of information, such as NYSDEC, US Fish and Wildlife Service, National Marine Fisheries Service, local bird clubs, colleges, standard natural history references, etc., may be used to supplement field data (Appendix A).

3. Observations of Stress - Obviously contaminated areas such as stained soils, leachate seeps, or exposed waste should be described. In addition, atypical biotic conditions such as reduced vegetative growth and density, wildlife mortality, changes in species assemblages and distribution, or the absence of expected biota should be reported. Records of past fish and wildlife contamination and/or mortality possibly associated with the site should be obtained from appropriate sources (Appendix A).

C. Description of Fish and Wildlife Resource Value

1. Value of Habitat to Associated Fauna - A qualitative assessment should be made of the general ability of the area within 0.5 miles of the site to support fish and wildlife. The degree to which the habitats meet the requirements for food, cover, bedding areas, breeding and roosting sites, etc., should be discussed. Qualitative assessments of fish and wildlife population densities and diversities should be included.

2. Value of Resources to Humans - The current and potential use of fish and wildlife resources by humans should be assessed. Resources on-site or within 0.5 miles of the site, documented resources within 2 miles of the site perimeter, and resources downstream of the site that may be affected by contaminants should be included. Human use of fish and wildlife resources may include hunting, fishing, wildlife observation, scientific research, and other recreational or economic activities. Appendix A identifies possible sources of information.

D. Identification of Applicable Fish and Wildlife Regulatory Criteria

Both contaminant-specific and site-specific criteria applicable to the remediation of fish and wildlife resources should be identified. Examples of contaminant-specific criteria include water quality standards and guidance values for the protection of aquatic life (6 New York Codes, Rules, and Regulations [NYCRR] Part 701 and NYSDEC Division of Water Technical and Operational Guidance Series [TOGS] 1.1.1) and sediment criteria developed by the Division of Fish and Wildlife (Technical Guidance for Screening Contaminated Sediments).

Site-specific criteria include the Freshwater Wetlands Act and its implementing regulations (NYS Environmental Conservation Law [ECL] Article 24, 6 NYCRR Parts 663 and 664), The Tidal Wetlands Act (ECL Article 25, 6 NYCRR Part 661) and the laws and regulations governing streams and navigable water bodies (ECL Article 15, 6 NYCRR Part 608). Identification of site-specific criteria should briefly describe performance standards for permit issuance cited in the regulation.

The responsibilities of the Division of Fish and Wildlife include the regulation and maintenance of fish and wildlife resources for human use. Consequently, the Division and other agencies have developed criteria that reflect this role. These criteria should also be identified.

Step II - Contaminant-Specific Impact Assessment

Objective and Scope

The objective of Step II is to determine the impacts of site-related contaminants on fish and wildlife resources. These impacts depend upon the contaminants of concern, the concentrations of contaminants in the media, the exposure of biota to the contaminants, and the toxic effects of the exposures. The impact assessment should either clearly demonstrate that contamination has a minimal impact on resources or, if significant impacts exist, identify the effects of site-related contaminants on the productivity, diversity, biomass, abundance, usability, etc., of fish and wildlife.

The development of the contaminant-specific impact assessment follows a stepwise process. This section presents three steps of increasing complexity (Pathway Analysis, Criteria-Specific Analysis, and Analysis of Toxic Effects) that assess the impacts of site-related contaminants on fish and wildlife. Each step relies on progressively more specific information and less conservative assumptions. Whether the impact assessment progresses through additional steps will depend on the conclusions reached at each step regarding the degree of impact. If minimal impact can be demonstrated at a specific step in the assessment, additional steps need not be undertaken.

The contaminant-specific impact assessment is based on Step I information and on the characterization and distribution of contaminants as determined in the remedial investigation. Although the final impact assessment need not be reported until the last phase of the remedial investigation, information should be reviewed as it becomes available. When possible, steps of the impact assessment for which information exists should be conducted during the initial phase of the remedial investigation. If the analysis does not demonstrate a minimal impact to fish and wildlife, the collection of additional information during subsequent phases of the remedial investigation may be required.

A. Pathway Analysis

A pathway analysis is the first step of the contaminant-specific assessment. Fish and wildlife resources, contaminants of concern, sources of contaminants, and potential pathways of contaminant migration and exposure should be identified. If no resources or pathways are present, impact to resources can be considered minimal. Similarly, impact is minimal if results from field studies demonstrate that contaminants have not migrated to a resource along a potential pathway. If, using a pathway analysis, minimal impact is concluded, no additional analysis is required.

B. Criteria-Specific Analysis

A criteria-specific analysis presumes the presence of contaminated resources and pathways of migration for site-related contaminants. This analysis uses numerical criteria (ARAR's, SCG's, TBC's) for contaminants of concern that have been established for specific media or biota. If published numerical criteria do not exist, criteria should be derived using methods established in ARARs, SCGs, or TBCs. For example, an analysis may develop numerical water quality criteria by applying methodology outlined in 6 NYCRR Part 701. Implicit in this analysis is the need for laboratory detection limits that are less than or equal to criteria. (Note that criteria for some metals in water are affected by hardness, and bioavailability of some sediment contaminants is influenced by total organic carbon; these should be analyzed in their respective media.)

Comparing site-specific contaminant levels with numerical criteria provides an assessment of potential impact. If contaminant levels in a medium (soil, water, sediment, air) fall below criteria, it is assumed the contaminant poses minimal threat to the resource, and additional analysis is unnecessary. If numerical criteria are exceeded or if they do not exist and cannot be developed by methods prescribed in regulations, an analysis of toxic effects is required.

C. Toxic Effect Analysis

Like criteria-specific analysis, a toxic effect analysis presumes that fish and wildlife resources have been identified and that the contamination of resources and contaminant pathways exist. Toxicity information to be used in the analysis should be taken from the scientific literature. When toxicity information for fish and wildlife does not exist for a contaminant, extrapolations from available laboratory animal data should be used.

An analysis of toxic effects may look at individual organisms, populations, communities, or ecosystems. The approach selected will depend on several factors including the complexity of the system, the relative importance assigned to specific biota, the modes of contaminant exposure, and the expected degree of toxicity associated with contaminant levels. More than one approach may be required to adequately characterize toxic and ecological effects. Impact is assessed by determining the degree to which contaminants affect the productivity and diversity of populations, species assemblages, communities, or ecosystems through direct toxicological and indirect ecological effects. This analysis should also discuss how the contamination affects the utility of wildlife to meet human needs.

1. Organism Level Analysis - An analysis of toxic effects at the individual organism level necessarily precedes an evaluation of higher level effects. If contaminant toxicity is not affecting individuals, there is no need to assess effects on populations, communities, or ecosystems. However, effects on individuals must always be considered when endangered, threatened or rare species are vulnerable. Toxicity should be evaluated for a full life cycle or for the most sensitive life stage using a sensitive species. The level of exposure must be derived from an evaluation of site-related contaminant data.

2. Population Level Analysis - A population level analysis is used to evaluate the acute and chronic toxic effects of contaminants on one or more species. Populations may be affected through changes in growth, reproduction, mortality or behavior, and may be vulnerable at any stage of the life cycle. Exposure is assumed to be continuous throughout the entire life cycle and to not vary among individuals or with life stages.

Exposure scenarios for a population level analysis can be developed from site-specific data. The analysis should assess the toxic effects on the dynamics of the population (age structure, recruitment, survival rates, etc.). Ultimately, the population analysis should assess the impact on productivity due to contaminant exposure.

3. Community Level Analysis - For ecological communities with highly interdependent species, an analysis of alterations in diversity due to contaminant exposure may be necessary. For example, communities with highly specialized predators that depend on a limited array of prey species (simple food webs), communities with highly competitive species (high niche overlap), or communities whose composition and diversity are maintained by keystone species are likely to undergo alterations in community structure as a result of toxic effects to one or more species. Benthic communities in streams often exhibit a considerable alteration in species composition and community structure due to contamination.

This analytical approach may require site-specific data describing the species composition and structure of affected ecological communities. The analysis should indicate the extent to which composition and structure within the community are altered by contaminant exposure.

4. Ecosystem Level Analysis - The ecological changes from toxic substances may be analyzed from the perspective of trophic dynamics. The analysis should include an evaluation of direct toxic and indirect ecological effects on productivity that result in contaminant-related alterations to trophic structure and function.

Ecosystem analysis should be undertaken if contaminants are expected to affect physiological processes that are associated with energy transformation within a specific trophic level. For example, if contaminants affect photosynthetic reactions of primary producers or affect common chemical processes regulating the metabolism of decomposers, an analysis employing trophic concepts may be appropriate in characterizing the toxic and ecological effects.

An analysis of materials transfer among trophic levels should be considered if trophic function is limited by the effect of contaminants on nutrient availability or if contaminants are likely to be transferred among trophic levels. For example iron, a potential contaminant, may reduce the availability of phosphorous in a phosphorus-limited system. More commonly, an analysis of materials transfer on trophic structure and function is applied in the evaluation of toxic effects resulting from contaminant transfer.

D. Study Methods

Performing a contaminant-specific impact assessment (Step II) will require specific toxicological or ecological information. Following are a number of sources/methods that are useful in developing appropriate information:

1. Contaminant-specific toxicity data obtained from the scientific literature.
2. Bioaccumulation calculations supported by the analysis of contaminated media and biota.
3. Modelling the environmental fate of contaminants.
4. In situ and laboratory toxicity tests of contaminated and uncontaminated media.
5. Histopathological studies of populations exposed to contaminants.
6. Comparison of population density, diversity, and species richness data from contaminated and uncontaminated areas.
7. Analysis of tissues from biota collected in contaminated and uncontaminated areas.
8. Evaluation of the potential use of fish and wildlife resources by humans from information available in surveys and records.

Step III - Ecological Effects of Remedial Alternatives

Objective and Scope

The objective of Step III is to evaluate the effects of the remedial alternatives on the productivity and diversity of fish and wildlife resources. This requires consideration of the potential non-contaminant related impacts of remedial activity, as well as consideration of the efficacy of remedial alternatives in correcting contaminant-specific effects. Remedial alternatives are evaluated using the Contaminant-Specific Impact Assessment as a "baseline." Similarly, non-contaminant related impacts are evaluated using the ecological information obtained in Step I as a "baseline." Before concerns for fish and wildlife resources can be weighed against other concerns (human health, cost, etc.) in selecting the preferred alternative, the biological "costs and benefits" associated with both non-contaminant and contaminant-specific ecological effects of each remedial alternative must be determined.

Ecological effects of remedial alternatives should be evaluated as part of the feasibility study. The effectiveness of remedial alternatives in achieving desired ecological effects and meeting other concerns should be evaluated concurrently. The evaluation process should clearly indicate the importance given to concerns for fish and wildlife resources in relationship to other concerns. Discussion of the selection of the preferred alternative and selected alternative in the Proposed Remedial Action Plan (PRAP) and the Record of Decision (ROD), respectively, should indicate how and to what extent the remedial action will address concerns for fish and wildlife resources.

The need for a monitoring program should be determined. The degree of contaminant removal or destruction under the remedial action is critical in making this determination. If a monitoring program is required, components of the program including monitoring of ecological resources, pathways, and contaminants of concern should be identified in the PRAP and the ROD.

A. Evaluation and Comparison of Remedial Alternatives

1. Contaminant-Related Effects - Contaminant-related effects include alterations in productivity and diversity that are directly or indirectly related to contaminant toxicity. Direct effects include mortality, morbidity, alterations in behavior and reproduction, etc., that are induced by exposure to contaminants. Indirect effects include alterations in species assemblages, ecological communities, and ecosystem function due to loss or reduction of biotic components. Additionally, diminished use by humans as a result of contaminated biota must be considered.

The remedial alternatives should be compared initially with contaminant-specific "baseline" conditions. The Contaminant-Specific Impact Assessment describing the current impacts on resources should serve as a "baseline." The evaluation of each alternative should indicate whether contaminant-specific criteria (ARARs, SCGs, and TBCs) are satisfied. If criteria cannot be satisfied under one or more remedial alternative, a comparison of alternatives should be made to establish the relative efficacy of each in restoring and/or maintaining the productivity, diversity and usability of fish and wildlife resources.

2. Other Effects - Non-contaminant related effects include alterations in the productivity and diversity of fish and wildlife resources due to the loss or modification of habitat. Remedial actions may eliminate habitat through construction or affect ecological communities through the modification of factors that affect habitat quality (hydrology, soil conditions, adjacent plant communities, etc.).

Remedial alternatives should be compared initially to "baseline" conditions to determine their potential for significant impact on resource productivity and diversity by habitat loss or modification. If an alternative may result in harm to a resource, further delineation and description of the resource may be necessary during the feasibility study to develop appropriate mitigation. The evaluation of each alternative should include mitigation for loss or modification of habitat. Effects should be categorized as long or short term. If significant impact is expected from one or more alternatives, the relative potential

impact of these alternatives on the productivity and diversity of resources should be identified.

B. Ecological Considerations in Selecting a Preferred Alternative

The Feasibility Study should compare the impacts of alternatives on the productivity and diversity of fish and wildlife resources. Comparisons should include the potential ecological costs and benefits of both contaminant and non-contaminant related effects. The alternative that will best restore and maintain the productivity and diversity of the affected resources should be identified as the alternative that minimizes risk to those resources. The weight of ecological concerns in the selection of a preferred alternative should be discussed. If the preferred alternative does not minimize risk to affected resources, an explanation should be provided indicating why minimization of risk to fish and wildlife is not possible and the extent to which the preferred alternative fails to meet this goal.

C. Conceptual Monitoring Program

1. Evaluation of Monitoring Need - The selected remedy should be evaluated to determine if a monitoring program is required. Sites that are remediated by containment or partial removal of contaminants will require post-remedial monitoring programs. Monitoring may not be required if residual contaminant levels present minimal risks to fish and wildlife.

2. Components of Monitoring Program - The objectives of the monitoring program are to determine: (1) if remedial measures meet expectations for minimizing risk to fish and wildlife and (2) if remedial measures remain effective over time. Affected resources, migration pathways, and contaminants of concern should be identified.

Step IV - Fish & Wildlife Requirements For Implementation of Remedial Actions

Scope and Objectives

This phase of a remedial action involves fish and wildlife requirements for implementation of the selected remedial alternative. It requires the accurate location of areas to be remediated or protected and the formulation of design plans for remedial construction. If appropriate, fish and wildlife resources may require delineation, and plans for restoration and/or protection may need to be developed. Specific information should be included on project plans and in construction specifications.

A. Delineation of Affected Resources

Although Steps I and III generally indicate the location of fish and wildlife resources and identify those that are contaminated and require remediation, a detailed delineation of resources affected by contamination or construction activity may be required at the design stage. Often, contamination affecting flowing waters requires detailed delineation, and the delineation of uncontaminated resources that may be affected by construction activities may be necessary. For example, the delineation of wetlands is usually required if construction activities are anticipated near or in the wetlands.

B. Methods of Protection for Fish and Wildlife Resources

Specific methods for protecting affected resources should be indicated on plans and in construction specifications. For example, siltation and erosion controls and a seasonal limitation for construction activities are often required. Siltation and erosion controls must be placed in construction

specifications, bid documents and on engineering drawings which clearly depict to scale resource boundaries (e.g. wetland boundaries) and the placement, design, performance criteria and maintenance of the controls. Controls must be in place prior to creating erodible conditions. If controls are to be designed by the contractor, specific plans must be submitted for review before construction begins.

C. Restoration/Replacement of Resources

If restoration or replacement of fish and wildlife resources is required as part of the selected remedial alternative, plans should be submitted for review during the design stage. Mitigation may include on-site or off-site restoration or the replacement of affected resources. An acceptable plan should be complete before remedial activity begins.

Step V - Monitoring Program

Scope and Objectives

The objectives of the monitoring program include insuring that the work performed complies with design specifications as they pertain to fish and wildlife resources, evaluating the efficacy of the remedial actions in minimizing risk to fish and wildlife, and determining the effectiveness of remedial measures over time.

A. Design Compliance

On-site inspection and evaluation should be done to insure that implementation complies with design specifications. The monitoring program should include criteria for evaluating results. Monitoring of biological populations may be needed to insure that construction is not affecting biota. Frequent inspections of erosion control devices will be required, and sampling of soil, water, or sediments may be necessary. An acceptable program must be completed before the remedial design is carried out. If monitoring results do not meet criteria, the design and methods should be re-evaluated and/or corrective action taken.

B. Remedial Action Effectiveness

Monitoring techniques to insure that the remedial action is effective in minimizing the risk from site-related contaminants to fish and wildlife may include: sampling media (water, sediment, soil, etc.), sampling tissue, toxicity testing, biomonitoring, or monitoring trends in population density or community diversity.

In the case of habitat restoration or replacement, long term evaluation of communities may be necessary to insure that there is adequate compensation for lost resources. Long-term sampling schedules and evaluation criteria must be established. If monitoring indicates that criteria have been exceeded, the remedial measures must be re-evaluated and/or corrective action taken.

APPENDIX A

**NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
INFORMATION SOURCES**

A. **SIGNIFICANT HABITATS PROGRAM AND NATURAL HERITAGE PROGRAM FILE
INFORMATION**

STATEWIDE REQUESTS

Include a brief narrative of the proposed project and a legible photocopy of the appropriate topographic quadrangle(s) with the site or sites identified when requesting information from the files. All requests should be addressed as follows:

ATTN: Information Services
Significant Habitat Unit
NYS Dept. of Environmental Conservation
700 Troy-Schenectady Road
Latham, New York 12110
(518) 783-3932

CONTACT: Kathy Schneider

REGIONAL REQUESTS

REGION 1 (Nassau, Suffolk Counties)

NYS Department of Environmental Conservation
Region 1
SUNY Campus, Loop Rd., Building 40
Stony Brook, New York 11790-2356
(516) 444-0305

CONTACT: Michael Scheibel

REGION 2 (New York City)

NYS Department of Environmental Conservation
Region 2
Hunters Point Plaza
47-40 21st Street
Long Island City, New York 11101-5407
(718) 482-4922

CONTACT: Joseph Pane

REGION 3 (Dutchess, Orange, Putnam, Rockland, Sullivan, Ulster, and Westchester Counties)

NYS Department of Environmental Conservation
Region 3
21 South Putt Corners Road
New Paltz, New York 12561-1696
(914) 255-5453

CONTACT: Theodore Kerpez

REGION 4 (Albany, Columbia, Delaware, Greene, Montgomery, Otsego, Rensselaer, Schenectady, and Schoharie Counties)

NYS Department of Environmental Conservation
Region 4
2176 Guilderland Avenue
Schenectady, New York 12306-4498
(518) 382-0680

NYS Department of Environmental Conservation
Region 4
Route 10 -Jefferson Road, HC01
Stamford, New York 12167-9503
(607) 652-7364

CONTACT: Karl Parker - Schenectady
William Sharrick - Stamford

REGION 5 (Clinton, Essex, Franklin, Fulton, Hamilton, Saratoga, Warren and Washington Counties)

NYS Department of Environmental Conservation
Region 5
Route 86
PO Box 296
Ray Brook, New York 12977-0296
(518) 897-1200

NYS Department of Environmental Conservation
Region 5
Box 220
CO Rt. 42
Warrensburg, New York 12885-0220
(518) 623-3671

CONTACT: Alan Koechlein - Warrensburg
Kenneth Kogut - Ray Brook

REGION 6 (Herkimer, Jefferson, Lewis, Oneida, and St. Lawrence Counties)

NYS Department of Environmental Conservation
Region 6
317 Washington St.
Watertown, New York 13601-3787
(315) 785-2236

NYS Department of Environmental Conservation
Region 6
State Office Building
207 Genesee Street
Utica, New York 13503
(315) 793-2554

CONTACT: John Page - Utica
Dennis Faulkham - Watertown

REGION 7 (Broome, Cayuga, Chenango, Cortland, Madison, Onondaga, Oswego, Tioga and Tompkins Counties)

NYS Department of Environmental Conservation
Region 7
615 Erie Boulevard West
Syracuse, New York 13204-2400
(315) 426-7400

NYS Department of Environmental Conservation
Region 7
1285 Fisher Avenue
Cortland, New York 13045-1090
(607) 753-3095

CONTACT: Raymond Nolan - Cortland
Joanne March - Syracuse

REGION 8 (Chemung, Genesee, Livingston, Monroe, Ontario, Orleans,
Schuyler, Seneca, Steuben, Wayne, and Yates Counties)

NYS Department of Environmental Conservation
Region 8
6274 East Avon-Lima Road
Avon, New York 14414-9519
(716) 226-2466

CONTACT: Dave Woodruff

REGION 9 (Allegany, Chataaugus, Erie, Niagara, Wyoming, and
Chautauqua)

NYS Department of Environmental Conservation
Region 9
270 Michigan Avenue
Buffalo, New York 14203-2999
(716) 851-7200

NYS Department of Environmental Conservation
Region 9
128 South Street
Olean, New York 14760-3632
(716) 372-0645

CONTACT: Russell Biss - Olean
Mark Kandel - Buffalo

B. GENERAL FISH AND WILDLIFE INFORMATION REQUESTS

STATEWIDE REQUESTS

Division of Fish and Wildlife
Central Office
50 Wolf Road
Albany, New York 12233-4750
(518) 457-5690

REGIONAL INFORMATION REQUESTS

(Mailing Addresses Listed Above)

REGION 1

Supervisor of Natural Resources - Charles Hamilton
Wildlife Manager - Harold Knoch
Fisheries Manager - Edward Woltmann
Supervisor of Regulatory Affairs
(Wetlands and Stream Permit
Information) - Robert Greene

REGION 2

Supervisor of Natural Resources - James Gilmore
Supervisor of Regulatory Affairs
(Wetlands and Stream Permit
Information) - Barbara Rinaldi

REGION 3

Supervisor of Natural Resources - Bruce MacMillan
Wildlife Manager - Glenn Cole
Fisheries Manager - Wayne Elliot
Supervisor of Regulatory Affairs
(Wetlands and Stream Permit
Information) - Margaret Duke

REGION 4

Supervisor of Natural Resources - John Renkavinsky
Wildlife Manager - Quentin VanNortwick
Fisheries Manager - Russ Fieldhouse
Supervisor of Regulatory Affairs
(Wetlands and Stream Permit
Information) - William Clarke

REGION 5

Supervisor of Natural Resources - Dale Huyck
Wildlife Manager - Robert Inslerman
Fisheries Manager - Lawrence Strait

Supervisor of Regulatory Affairs
(Wetlands and Stream Permit
Information) - Richard Wild

REGION 6

Supervisor of Natural Resources -
Wildlife Manager - Dennis Faulkham
Fisheries Manager - Albert Schiavone
Supervisor of Regulatory Affairs
(Wetlands and Stream Permit
Information) - Randy Vaas

REGION 7

Supervisor of Natural Resources - Cliff Creech
Wildlife Manager - John Proud
Fisheries Manager - Leslie Wedge
Supervisor of Regulatory Affairs
(Wetlands and Stream Permit
Information) - Raymond Nolan

REGION 8

Supervisor of Natural Resources - Edward Holmes
Wildlife Manager - Lawrence Myers
Fisheries Manager - Bill Abraham
Supervisor of Regulatory Affairs
(Wetlands and Stream Permit
Information) - Albert Butkas

REGION 9

Supervisor of Natural Resources - Lawrence Nelson
Wildlife Manager - Russell Biss
Fisheries Manager- Stephen Mooradian
(Wetlands and Stream Permit
Information) - Steven Doleski

C. REQUESTS FOR OBSERVED EFFECTS INFORMATION

Fish Kills, Associated Bioassays -NYSDEC Region 1 and 2:

Fish Manager - Region 1

(516) 444-0280

CONTACT: Edward Woltmann

Fish Kills, Associated Bioassays - NYSDEC Regions 3-6:

Environmental Disturbance Investigation Unit
New York State Department of Environmental Conservation
Hale Creek Field Station
182 Steele Avenue Extension
Gloversville, New York 12078
(518) 773-7318

CONTACT: Timothy Preddice

Fish Kills, Associated Bioassays - NYSDEC Regions 7-9:

Environmental Disturbance Investigation Unit
New York State Department of Environmental Conservation
6274 East Avon-Lima Road
Avon, New York 14414-9519
(716) 226-2466

CONTACT: Gary Neuderfer

Wildlife Mortality:

Wildlife Pathology Unit
New York State Department of Environmental Conservation
Wildlife Resources Center
108 Game Farm Road
Delmar, New York 12054
(518) 439-8042

CONTACT: Ward Stone

Contaminant Residues in Fish and Wildlife Tissues:

Toxic Substances Monitoring Program
New York State Department of Environmental Conservation
50 Wolf Road - Room 530
Albany, New York 12233-4756
(518) 457-1769

CONTACT: Ronald Sloan

Other Reliable Sources:

" Notes in NYSDEC Phase I Reports.

- " New York State Department of Health Files.
- " New York State Department of Environmental Conservation Regional Offices (Fish and Wildlife Staff).
- " U.S. Fish and Wildlife Service, 100 Grange Place, Cortland, New York 13045
- " Universities.

D. **Questions on FWIA**

Division of Fish and Wildlife
Bureau of Environmental Protection
Hazardous Waste Site Evaluation Unit
Albany, New York 12233-4756
(518) 457-1769

CONTACT: Richard Koeppicus

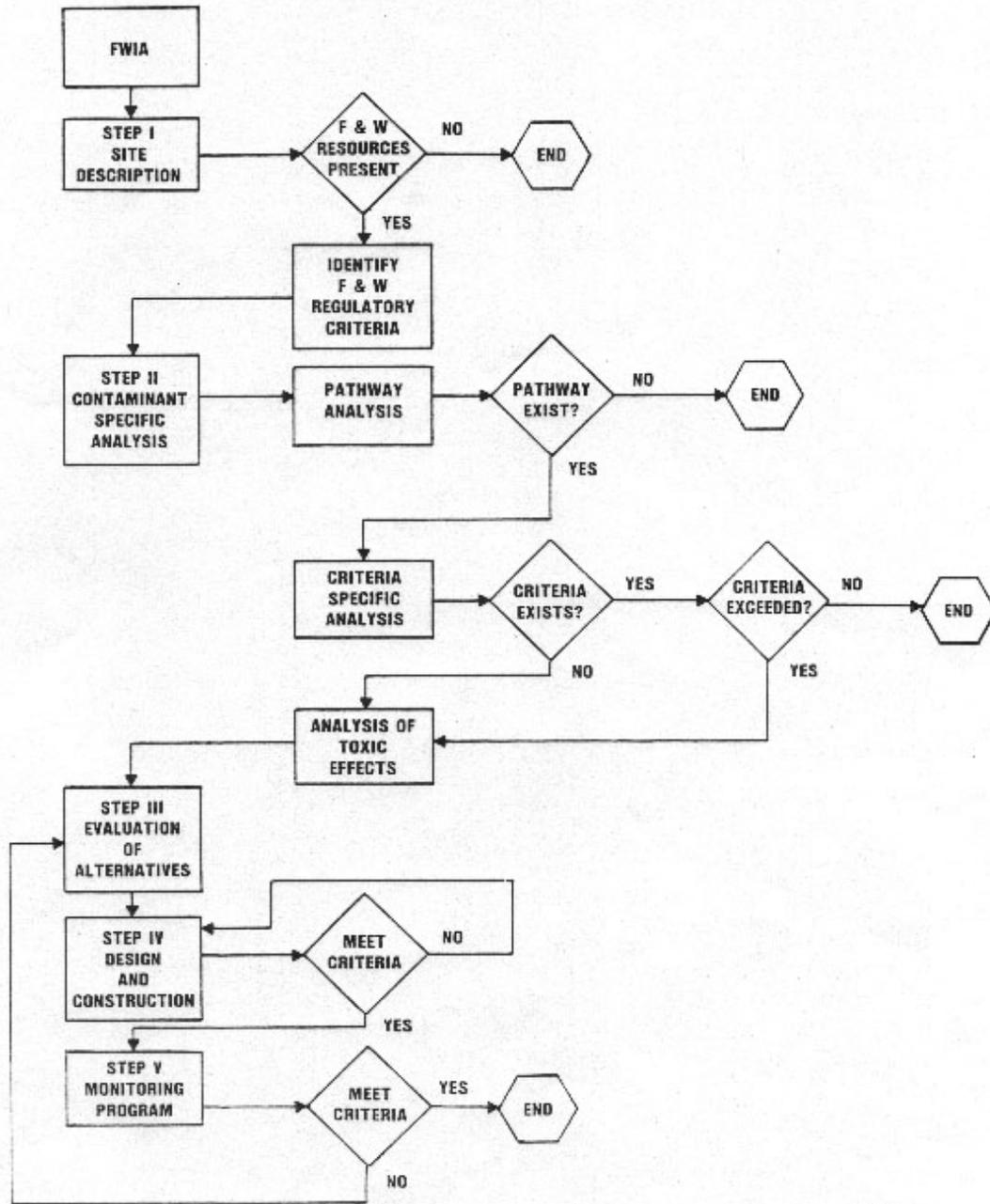
Appendix B

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- USEPA. 1989. Ecological Assessment of Hazardous Waste Sites: A Field and Laboratory Reference Document. EPA/600/3-89/013.
- USEPA. 1989. Risk Assessment Guidance for Superfund: Environmental Evaluation Manual. EPA/540/1-89/001A.
- USEPA. 1988. Review of Ecological Risk Assessment Methods. EPA/230-10-88-041.
- USEPA. 1988. Protocols for Short-Term Screening of Hazardous Waste Sites.
- USEPA. 1985. Methods of Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms. Third edition. EPA/600/4-85/013.
- NYSDEC. 1985. Manual for Toxicity Testing of Industrial and Municipal Effluents.
- NYSDEC. 1993. Technical Guidance for Screening Contaminated Sediments. Division of Fish and Wildlife.
- NYSDEC. 1990. Ecological Communities of New York State.
- NYSDEC. 1990. Biological Impairment Criteria for Flowing Waters in New York State. Division of Water.
- NYSDEC. 1987. Acute and Chronic Toxicity Testing in the SPDES Permit Program. Division of Water Technical and Operational Guidance Series 1.3.2.
- NYSDEC. 1986. Development of Field Protocol for Monitoring PCB Uptake with Caged Live Fish During Dredging Operations.
- NYSDEC. 1981. Ambient Water Quality Standards and Guidance Values. Division of Water Technical and Operational Guidance Series 1.1.1.
- NYSDEC. 1993. Freshwater Wetlands Regulation Guidelines on Compensatory Mitigation.

Appendix C

Appendix C
FWIA DECISION CHART



C-1

Appendix D

FWIA Checklist

Step I Site Description

A. Site Maps

Did you include:

1. Topographic map?
2. Covertypes map?
3. Drainage map?
4. Are maps legible?

B. Description of Fish and Wildlife Resources

1. Are covertypes adequately described?
2. Are typical species associated with the site identified?
3. Have areas of stress been identified?

C. Description of Fish and Wildlife Resource Value

1. Is a qualitative assessment of habitat value included?
2. Is an assessment of the value of fish and wildlife resources to humans included?

D. Identification of Applicable Fish and Wildlife Regulatory Criteria

1. Are any of the following NYS laws, rules, regulations and criteria applicable?

- a. **Environmental Conservation Law - Chapter 43-B of the Consolidated Laws**

Article 11, Fish and Wildlife

- | | |
|------------|---|
| § 11-0503. | Polluting streams prohibited. |
| § 11-0515. | Licenses to collect, possess, or sell for propagation, scientific or exhibition purposes. |
| §11-0535. | Endangered and threatened species. |

Article 15, Water Resources

Title 5 Protection of Water
Title 27 Wild, Scenic and Recreational Rivers System

Article 24, Freshwater Wetlands

Article 25, Tidal Wetlands

b. **New York Codes, Rules and Regulations(6 NYCRR)**

Part 182 Endangered and Threatened Species of Wildlife; Species
 of Special Concern

Part 608 Use and Protection of Waters

Part 661 Tidal Wetlands - Land Use Regulations

Part 662 Freshwater Wetlands - Interim Permits

Part 663 Freshwater Wetlands Permit Requirements

Part 664 Freshwater Wetlands Maps and Classification

Part 665 Local Government Implementation of the Freshwater
 Wetlands Act and Statewide Minimum Land - Use
 Regulations for Freshwater Wetlands

Part 666 Administration and Management of the Wild, Scenic and
 Recreational Rivers System in New York State
 Excepting the Adirondack Park

Part 701 Classifications - Surface Waters and Groundwaters

Part 702 Derivation and Use of Standards and Guidance Values

Part 703 Surface Water and Groundwater Quality Standards and
 Groundwater Effluent Standards

Part 704 Criteria Governing Thermal Discharges

Part 800 ff. Classes and Standards of Quality and Purity Assigned to
 Fresh Surface and Tidal Salt Waters

c. **Criteria and Guidelines**

Technical Guidance for Screening Contaminated Sediment, November 1993,
NYSDEC Division of Fish and Wildlife.

Division of Water Technical and Operational Guidance Series 1.1.1.,Ambient

2. Have all appropriate federal laws, rules and criteria pertaining to fish and wildlife been identified?

Step II - Contaminant-Specific Impact Assessment

A. Pathway Analysis

Are resources, contaminants, sources of contaminants and pathways identified?

B. Criteria-Specific Analysis

1. Are numerical criteria identified?
2. If possible, are criteria derived when none exist?
3. Are comparisons made with site contaminant data?

C. Toxic Effect Analysis

1. Are toxicity information sources identified?
2. Are endangered, threatened or rare species evaluated if present?

Step III - Ecological Effects of Remedial Alternatives

A. Evaluation and Comparison of Remedial Alternatives.

1. Are contaminant related effects of alternatives compared?
2. Are non-contaminant effects of alternatives weighed?

B. Ecological Considerations in Selecting a Preferred Alternative.

1. Is the remedial alternative that best restores or maintains the productivity and biodiversity identified?
2. Is the weight of ecological concerns in selecting a preferred alternative discussed?

C. Conceptual Monitoring Program

1. Is the selected remedy evaluated to determine if a monitoring program is required?
2. Can the monitoring program determine if:
 - a. remedial measures minimize risk to fish and wildlife?
 - b. remedial measures remain effective?

Step IV - Fish and Wildlife Requirements for Implementation of Remedial Actions.

A. Delineation of Affected Resources

Is a need for delineating resources identified?

B. Methods of Protection for Fish and Wildlife Resources

Are siltation and erosion controls placed on engineering drawings?

C. Restoration/Replacement of Resources

Should plans be presented for restoration or replacement of habitat?

Step V - Monitoring Program

A. Design Compliance

Is a plan developed to insure that implementation complies with design specifications?

B. Remedial Action Effectiveness

Is the monitoring program capable of determining the remedial alternative's effectiveness?