

3 DEVELOPMENT AND SCREENING OF TECHNOLOGIES

3.1 General Response Actions

General response actions describe those actions that will satisfy the remedial action objectives. In developing alternatives, combinations of general response actions may be identified.

General response actions include:

- No action (all media)
- Institutional controls (all media; zoning restriction, dredge restrictions)
- Containment (groundwater containment and sediment capping)
- Removal/collection (groundwater extraction, soil excavation, dredging)
- In-situ treatment or stabilization (groundwater injection treatment or soil stabilization)
- Ex-situ treatment or stabilization (thermal desorption, pump and treat groundwater)
- Disposal/discharge (on-site or off-site)

Table 2 presents the general response actions. Remedial technologies and process options associated with each of the general response actions are identified on Table 2 and further screened as discussed below. The in-situ treatment or stabilization, containment, and on-site disposal for soil were not considered because source removal was performed at the Site.

3.2 Identification and Screening of Technology Types and Process Options

Remedial technologies and related process options that potentially would achieve the RAOs for each media of concern were screened with respect to the following criteria:

- **Effectiveness:** This criterion evaluated the ability of a technology to achieve the RAOs and to provide long-term protection of human health and the environment. Potential short-term impacts to human health and the environment, and the reliability of the technology are also evaluated;

- **Implementability:** This criterion addresses the technical and administrative feasibility of implementing the technology as well as the availability of contractors and materials, the potential site constraints (on- and off-site), the difficulties monitoring the effectiveness of the process option, and agency coordination or permits; and
- **Cost:** This criterion utilizes engineering judgment to develop relative estimated costs of each technology for a given RAO. The cost estimates are qualitative (low, moderate and high) at this technology screening stage of the FS.

Table 3 provides a description of the technologies and process options considered and summarize the screening criteria used to retain or eliminate an option from further consideration. Reasoning for eliminating a technology and process option is provided on Table 3.

3.3 Assemble and Document Remedial Alternatives

Based on the results of the preliminary screening of remedial technologies, the following four remedial alternatives will be further considered.

RAO Addressed	Alternative 1	Alternative 2	Alternative 3	Alternative 4
RAO-1 Soil	No Action	Institutional Controls	Institutional Controls	Institutional Controls and Limited Soil Removal/Disposal
RAO-2 Groundwater	No Action	Institutional Controls and Monitored Natural Attenuation	Institutional Controls and Monitored Natural Attenuation	Institutional Controls and Groundwater Extraction and Ex-Situ Treatment
RAO-3 Wisconsin River Sediment	No Action	No Action	No Action	Sand Cover (Alternative 4a) Sand Cover and Armor (Alternative 4b)
RAO-4 Piffner Pioneer Park Pond Sediment	No Action	No Action	Sand Cap (Alternative 3a) Sand Cap with Activated Carbon (Alternative 3b)	Dredge and Sand Cover

3.3.1 Alternative 1

Consistent with NCP requirements, a No-Further Action Alternative will be considered. Alternative 1 does not include any remedial action component or monitoring to minimize potential exposures related to soil, groundwater or sediment at the Site. The No-Further Action Alternative will be used as a baseline for comparison of other assembled remedial alternatives.

3.3.2 Alternative 2

Alternative 2 monitors natural attenuation in groundwater and protects human health receptors through institutional controls on soil and groundwater. No-further action will be performed in Pfiffner Pioneer Park Pond or the Wisconsin River.

3.3.3 Alternative 3a

Alternative 3a monitors natural attenuation in groundwater and protects human health receptors through institutional controls on soil and groundwater. Alternative 3a also includes placement of a six-inch cap of sand in Pfiffner Pioneer Park Pond, which will be monitored to verify the sand is present. No-further action will be performed in the Wisconsin River.

3.3.4 Alternative 3b

Alternative 3b is identical to Alternative 3a but includes activated carbon in the sand cap for the Pfiffner Pioneer Park Pond.

3.3.5 Alternative 4a

Alternative 4a includes removal of affected-soil from the former slough, institutional controls on soil and groundwater above the respective PRGs, groundwater extraction and ex-situ treatment prior to discharge to the public wastewater treatment plant, removal of all (or to the extent practical) soft sediment in Pfiffner Pioneer Park Pond and placement of a six-inch sand cover in the Wisconsin River.

3.3.6 Alternative 4b

Alternative 4b is identical to Alternative 4a but includes placement of six inches of an armor layer over the 6-inch sand layer in the Wisconsin River.