

**APPENDIX F**  
**ECOLOGICAL RISK ASSESSMENT CHECKLISTS**

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**Ecological Risk Assessment  
Screening Checklist for Potential Receptors and Habitat  
Level 1, Checklist A**

1. Is the boundary of the contaminated area less than ½ mile to a surface water body (stream, river, pond, lake, etc.)?
2. Are wetlands (as defined by the 1987 Corps of Engineers' Delineation Manual) on or adjacent to the site?
3. Are contaminated soils uncovered or otherwise accessible to ecological receptors and the elements?
4. Are there karstic features (see Ecological Risk Assessment Figure #2 for definition) on or within ½ mile of the boundary of the contaminated area?

Note: A professional opinion may be necessary to make this determination. The Missouri Environmental Geology Atlas (MEGA), published recently by the Department of Natural Resources, Division of Geology and Land Survey (DGLS) provides several state-wide, karst-related data sets, as well as others related to geology and hydrology, in a geographic information system format that can assist in this determination. MEGA, including software to view the data sets, may be obtained from DGLS by calling (573) 368-2125.

5. Are there federal or state rare, threatened, or endangered species on or within ½ mile of the contaminated area? Note: The ½ mile criterion does not apply to situations where a hydrological connection exists between the site and karstic features. Contact the Missouri Department of Conservation for state-listed species and the U.S. Fish and Wildlife Service for federally listed species.
6. Are there one or more environmentally sensitive areas (see Ecological Risk Assessment Figure #1 for definition) at or within ½ mile of the contaminated area?
7. Are commercially or recreationally important species (fauna or flora) on or within ½ mile of the contaminated area?

If the answer is "Yes" to any of the above questions, then complete Ecological Risk Assessment Checklist for Potential Exposure Pathways, Checklist B.

**Ecological Risk Assessment  
Screening Checklist for Potential Receptors and Habitat  
Level 1, Checklist B**

- 1.a.) Can contaminants associated with the site leach, dissolve, or otherwise migrate to groundwater?
- 1.b.) Are contaminants associated with the site mobile in groundwater?
- 1.c.) Does groundwater from the site discharge to ecological receptor habitat?

**Question 1:** Could contaminants associated with the site reach ecological receptors via groundwater?

- 2.a.) Is Non-Aqueous Phase Liquid (NAPL) present at the site?
- 2.b.) Is NAPL migrating?
- 2.c.) Could NAPL discharge occur where ecological receptors are found?

**Question 2:** Could contaminants from the site reach ecological receptors via migration of NAPL?

- 3.a.) Are contaminants present in surface soils?
- 3.b.) Can contaminants be leached from or be transported by erosion of surface soils?

**Question 3:** Could contaminants reach ecological receptors via erosional transport of contaminated soils or via precipitation runoff?

- 4.a.) Are contaminants present in surface soil or on the surface of the ground?
- 4.b.) Are potential ecological receptors on the site?

**Question 4:** Could contaminants reach ecological receptors via direct contact?

- 5.a.) Are contaminants present on the site volatile?
- 5.b.) Could contaminants on the site be transported in air as dust or particulate matter?

**Question 5:** Could contaminants reach ecological receptors via inhalation of volatilized contaminants or contaminants adhered to dust in ambient air or in subsurface burrows?

- 6.a.) Are contaminants present in surface and shallow subsurface soils or on the surface of the ground?
- 6.b.) Are contaminants found in soil on the site taken up by plants growing on the site?
- 6.c.) Do potential ecological receptors on or near the site feed on plants (e.g., grasses, shrubs, forbs, trees, etc.) found on the site?
- 6.d.) Do contaminants found on the site bioaccumulate?

**Question 6:** Could contaminants reach ecological receptors via direct ingestion of soil, plants, animals or contaminants?

- 7.a.) Are there karstic features (see Ecological Risk Assessment Figure #2 for definition) on or within ½ mile of the contaminated area?
- 7.b.) Is there a hydrogeological connection between the site and karstic features such as seeps, springs, streams or other surface water bodies?

**Question 7:** Could contaminants reach ecological receptors via transport through a karst system?

Note: A professional opinion may be necessary to answer 7.a, 7.b, and Question 7. The Missouri Environmental Geology Atlas (MEGA), published recently by the Missouri Department of Natural Resources, Division of Geology and Land Survey (DGLS), provides several state-wide, karst-related data sets, as well as others related to geology and hydrology, in a geographic information system format, that can assist in answering these questions. MEGA, including software to view the data sets, can be obtained from DGLS by calling (573) 368-2125. The determination of proximity to karst features/topography under questions 7b and 7 of Checklist B does not always require a field determination. However, in some cases, a field determination may be appropriate.

If the answer to one or more of the seven above questions is “Yes”, the department may require further assessment to determine whether the site poses an unacceptable risk to ecological receptors.

**Ecological Risk Assessment**  
**Figure #1: Environmentally Sensitive Areas**

An Environmentally Sensitive Area is of special significance due to its flora or fauna, the sensitive nature of its natural features, historical considerations, or other reasons associated with the environment.

Examples of environmentally sensitive areas include, but are not limited to, the following:

- National and state parks,
- Designated and proposed federal and state wilderness and natural areas,
- Endangered, rare, and threatened species habitat as designated by the U.S. Department of the Interior or the Missouri Department of Conservation,
- National monuments,
- National and state historic sites,
- National and state lakeshore and river recreational areas,
- Federal or state designated scenic or wild rivers,
- Habitat of federal or state designated or proposed endangered, rare, or threatened species, and species under review as to their endangered, rare, or threatened status,
- National and state preserves and forests,
- National and state wildlife refuges,
- Critical fish and shellfish spawning areas,
- Critical migratory pathways and feeding areas for anadromous fish species within river reaches or areas in lakes where such species spend extended periods of time,
- Terrestrial areas used for breeding by large or dense aggregations of faunal species,
- State lands designated by the Missouri Department of Conservation for wildlife or game management,
- Wetlands as defined by the 1987 Corps of Engineers Delineation Manual and
- Outstanding state resource waters as designated by the Missouri Clean Water Commission.

**Ecological Risk Assessment**  
**Figure #2: Karst Features**

Karst: A distinctive set of geomorphic landforms resulting from the development of extensive subsurface solution channels and caves in carbonate rocks (Boulding, 1995).