

Toolkit for Greener Practices

Showcase of Ideas

Option 1-2: Innovative and More Efficient Remedies

Ground Water Treatment Through a Restored Wetland

Site conditions:

Ground water is contaminated with chlorinated solvents from a degreasing operation at a former manufacturing plant. An existing channel that discharged to a lake captured the groundwater plume. The site location is exclusive residential developments along the popular lake. The site cleanup is being conducted under the Minnesota Superfund law.

Preventive activity description:

The preferred remedy involved restoring a former lakeshore wetland that had been channelized to accommodate residential development in the early 1900s. Natural attributes of the restored wetland would treat the groundwater plume that discharged into the channelized area formerly occupied by the wetland.

Benefits realized through the Pollution Prevention/Sustainability approach:

- The remedy selection enhances the natural environment and avoids creating new sources.
- Pre-1900s wetland was restored.
- Additional surface water quality protection and more functional fit with existing lakeshore development (green space development)
- Highly adaptable natural processes (biomimicry)
- Mixed anaerobic/aerobic environment optimal for transformation of TCE and degradation byproducts (Highly organic sediments of wetland support anaerobic niches. Oxygen supplied by wetland vegetation sustains aerobic niches.)
- Provides long-term treatment — doesn't get "shut off" (sustainable)
- Not subject to mechanical/equipment disruptions
- No chemical injected into the ground water (low energy)
- No sewer discharge (no cross-media transfer)

Keys to Success

- Close cooperation between the voluntary party, federal, state and local governmental agencies, and the regional watershed district ensured that the proper permits for an innovative remedy were in place.
- Superb graphics and education effort on the part of the environmental consultant made it easier for residents and officials to understand complex hydrogeology and remedy design.
- Groundwater modeling showed a working understanding of the process using the best available science (MODPATH and BIOCHLOR programs were run to address specific design issues).

- Redundancy (They had a plan for when the system didn't work like the model suggested.)
- Patience
- Good remedy design, construction and monitoring (Sparging supplements natural system degradation, if necessary. Site, remedy performance, and compliance monitoring included.)

Regulatory administrative/legal tools:

- Record of Decision outlining the approved response action plan and long-term monitoring (contingency) plan
- Public mailing (a fact sheet) to solicit comments: Response action plan was critiqued, formalized and accepted within the community as part of this process.

Recognition: Gratitude for this information and recognition for this innovative work go to Don Richard at Barr Engineering and the voluntary party.