13. CONTAMINATED SEDIMENTS

Contacts: Greg Hill, Jim Killian, Xiaochun Zhang
Last updated: 11-2007

Status: Partially in Place

Some monitoring of contaminated sediments is currently done on a limited basis. The WDNR has limited staff and funding available to conduct and manage a contaminated sediment site evaluation/assessment program. However, the Department has produced a number of guidance documents which describe a multi-tiered approach to site assessment. This approach is utilized for projects funded directly by the Department and for review of site investigations proposed by other entities. The program has moved forward more rapidly in the Great Lakes Basin waters because of the focus of federal and state resources to address impaired waters and high levels of contamination in the Areas of Concern in the Great Lakes.

Monitoring Objectives

Clean Water Act Objectives

- Determining water quality standards attainment
- Identifying impaired waters
- Identifying causes and sources of water quality impairments
- Supporting the implementation of water management programs
- Supporting the evaluation of program effectiveness

Specific Objectives

Within the limited resources that are available, the Department strives to:

- Establish monitoring protocols for sediment assessment.
- Assess sediments as a potential source of water quality impairment.
- Establish the presence of contaminants linked to the issuance of fish consumption advisories.
- Establish links to potential sources of the discharge of the contamination in order to identify responsible parties.
- Develop a basis for development of site specific water quality based sediment clean up standards.
- Establish protocols for determining the success of remediation actions.
- Coordinate with the baseline monitoring program when possible to achieve sampling efficiencies.

Monitoring Design

The Department has established a multi-tiered approach to sediment assessment. This approach is flexible in its application based on the amount of water quality and source information available. The statewide fish contaminant sampling program has historically identified a number of locations with contaminated fish but for which there are no current discharges of bio-accumulative contaminants. Similarly, or in concert with the fish contaminant monitoring, baseline ambient water quality assessments have turned up impaired waters with no known sources. The monitoring design for suspected contaminated sediment sites involves a team of individuals that focus on sediment chemistry, bioassay, and site delineation. Likewise, the sediment investigations are implemented in a coordinated fashion that can involve multiple programs and central office with regional staff. Bioassay work is conducted by the Wisconsin State Lab of Hygiene.

Core and Supplemental Water Quality Indicators

Due to the dynamic nature of streams, there are no specific core indicators for the sediment monitoring program. The sampling tends to be investigative in nature triggered by water quality impairments such as elevated levels of fish tissue contamination or in concert with upland site investigations. Grab samples for surficial sediments or core samples for a longer-term record are used. To date bio-accumulative substance such as PCBs, DDT, and mercury as well as PAH (polyaromatic hydrocarbons) have most frequently been the focus. However in other instances other contaminants such as ammonia and arsenic have been evaluated.

Quality Assurance

It is standard operating procedure to develop a quality assurance and sampling and analysis plan for the site investigations prior to initiating the study. The State Lab of Hygiene is our reference lab for the state and all private labs must be certified by the state in order to produce acceptable results.

Data Management

The Department maintains the statewide data in the Fish-Sediment Contaminant Database. Due to the nature of the program where potentially responsible parties are identified to assume the site specific work, additional site-specific databases are maintained. When the more comprehensive SWIMS database is completed, contaminated sediment data will be stored there.

Data Analysis/Assessment

The sediment assessment data are analyzed in a coordinated and integrated fashion in order to assess the risk associated with the site, determine appropriate responses, solicit voluntary or enforcement-based response actions by responsible parties or conduct the remedial actions ourselves, and document remediation success. The WDNR has produced guidance for the use and analysis of sediment site data entitled "Consensus-based Sediment Quality Guidelines."

Reporting

The WDNR has created a Contaminated Sediment Team with cross-program representatives who coordinate site assessment procedures and maintain a sediment site inventory for the state. The Department has used this inventory in a number of ways including the development of the 303(d) list of impaired waters and in the preparation of the 305(b) Water Quality Report to Congress. In the future these will be integrated into a joint 303(d)/305(b) Report. The listing will also be used for site tracking and work planning in the future.

Programmatic Evaluation

The contaminated sediment program will be managed under the Sediment Management Section in the Bureau of Watershed Management. It is anticipated that this program sub-element will be reviewed on the same cycle as the remaining portion of the water management program.

General Support and Infrastructure Planning

As part of the initial work efforts conducted by the new Sediment Management Section, the Department will assess the needs for program administration.