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# **Enbridge Oil Spill**

## **Natural Resource Damage Assessment Framework**

The purpose of this framework is to provide an overview of the Enbridge oil spill natural resource damage assessment (NRDA), including Trustee activities during the preassessment phase of the NRDA and Trustee priorities for the restoration planning phase. Section 1 provides general background on the spill and the NRDA. Section 2 summarizes Trustee preassessment activities and priorities for the restoration planning phase for the assessment of ecological injuries and service losses, and Section 3 summarizes similar information for human use service losses. Section 4 presents anticipated activities for the selection and prioritization of restoration projects. Finally, Section 5 discusses the standards of performance that will be followed for the NRDA.

### **1. Background**

On July 25 or 26, 2010, a transmission pipeline owned by Enbridge Energy Partners, Limited Partnership (Enbridge) ruptured causing heavy crude oil to flow from this pipeline near the town of Marshall, Calhoun County, Michigan. The oil discharged into Talmadge Creek, which is a tributary of the Kalamazoo River. The pipeline was shut down and isolation valves were closed, stopping the source of the oil. However, prior to stopping the discharge, it is estimated that approximately one million gallons of crude oil were released to Talmadge Creek and the Kalamazoo River. The spill occurred during a high flow event, and thus, oil was distributed both within the river and the inundated floodplain for approximately 40 river miles downstream of the point of discharge (two miles of Talmadge Creek and 38 miles of the Kalamazoo River). The farthest downriver that oil traveled was the dam on Morrow Lake. Response activities began within the river and floodplain shortly after the discovery of the spill. The river remains closed as of April 2, 2012, and response activities are ongoing. As the U.S. Environmental Protection Agency (EPA) is completing response actions along the creek, river and floodplain, the Michigan Department of Environmental Quality (MDEQ) is pursuing remedial investigation work in those areas.

The Trustees engaged in preassessment activities upon occurrence of the spill. The Trustees include MDEQ, the Michigan Department of Natural Resources, the Michigan Department of the Attorney General, the U.S. Department of Interior acting through the U.S. Fish and Wildlife Service and the Bureau of Indian Affairs, the U.S. Department of Commerce acting through the National Oceanic and Atmospheric Administration, the Nottawaseppi Huron Band of the Potawatomi (NHBP), and the Match-E-Be-Nash-She-Wish Band of the Pottawatomi. During the preassessment phase, the Trustees conducted numerous studies and surveys to collect ephemeral

data (described in further detail below). Enbridge participated in many of these pre-assessment phase surveys and data collections.

On March 1, 2012, the Trustees released a Notice of Intent to conduct restoration planning. As they enter into the restoration planning phase of the NRDA, the Trustees intend to evaluate and implement appropriate scaling approaches to determine the amount of restoration needed to address the losses that have occurred within the affected river and floodplain.

The activities described herein encompass a variety of efforts for undertaking ecological injury assessment, human use assessment, and restoration planning. The efforts described herein are a continuation of ongoing work, which began in July 2010.

Below we briefly summarize an assessment framework for categories of injury and service loss that the Trustees are currently considering for the Kalamazoo River NRDA. The Trustees are currently assessing two broad categories of injuries and losses: (1) ecological and (2) human use service losses. For both of these categories, the Trustees are evaluating injuries and service losses caused by the discharged oil, as well as injuries and losses resulting from response and remedial activities undertaken because of the discharge of oil.

## **2. Ecological Injuries and Service Losses**

The Trustees are evaluating several categories of ecological injuries and service losses that may have occurred as a result of the discharge of oil and response and remedial activities. These categories include injuries to floodplain habitat; potential in-river injuries to habitat, fish, turtles, mussels, benthic invertebrates, and other aquatic biota; impacts to the fluvial geomorphology of the river (e.g., erosion of shoreline banks); and impacts, including mortality, to birds and other biota that were directly oiled. Below we briefly describe work conducted by the Trustees during the preassessment phase and activities the Trustees anticipate pursuing during the restoration planning phase for each of these ecological injury and service loss categories.

The Trustees conducted a number of surveys to document the potential nature and extent of impacts in the floodplain during the preassessment phase of the NRDA. The Trustees conducted a floodplain survey days after the spill to document the extent and degree of oiling within the floodplain. The Trustees also conducted a rapid vegetation assessment to characterize the types of habitat and vegetation present within the floodplain (August 2010). A second rapid vegetation assessment was conducted in fall 2011. Trustees plan to compile the information gathered during these surveys, in combination with information already compiled on response activities (e.g., soil excavation, vegetation removal), and any relevant information that may be gathered during remedial activities, into a single geographic information system database to document the nature and extent of oil, response and remedial activity impacts within the floodplain.

As part of the restoration planning phase of the NRDA, the Trustees intend to (1) track ongoing response and remedial activities and provide comments as appropriate; (2) assess the need for and implement any further data collection activities or studies (either field or desktop) to characterize injury (3) continue to monitor recovery in the floodplain (e.g., repeat the rapid vegetation assessment in 2012); and (4) decide upon scaling approaches (e.g., habitat equivalency analysis) to estimate the amount of restoration that may be needed to address losses caused by oil and restoration activities, once the full extent of response and remedial activities and mitigation actions are known. The Trustees also collected ephemeral in-river data during the preassessment phase of the NRDA. They collected surface water, sediment, mussel tissue, and fish tissue and bile samples for chemical analysis, including oil constituents such as polycyclic aromatic hydrocarbons. Standardized fish community and benthic invertebrate surveys were conducted within days of the spill, and repeated in the summer of 2011. The Trustees also implemented a mussel shell survey to document crushed and broken shells that likely resulted from response activities in the river. They compiled information on fish and mussel kills associated with the discharge event. The Trustees also reviewed and commented on response work plans and other documents, including, for example, shoreline erosion mitigation and monitoring plans. Response activities within the river were ongoing through fall 2011, and monitoring to evaluate the effectiveness of in-river actions will occur in spring 2012, as directed by EPA.

During the restoration planning phase of the NRDA, the Trustees intend to (1) continue to track response and remedial activities; (2) continue to monitor the recovery of the river (with, for example, fish community and benthic invertebrate surveys and erosion mitigation monitoring); (3) conduct analyses of archived samples (e.g., bile and histopathology samples collected from fish); (4) assess the need for and conduct any additional studies (field or desktop) to characterize injuries and recovery within the river and floodplain; and (5) evaluate alternative restoration scaling techniques for in-river resources injured by oil and response and remedial activities, once the full extent of response and remedial activities are known.

During the preassessment phase, the Trustees gathered wildlife data that were collected as a part of response activities. These data summarize the number of birds, turtles, frogs, and other biota that were found dead or oiled, as well as the number of biota that were rehabilitated and released, or died during rehabilitation. During the assessment planning phase, the Trustees intend to consider these data to estimate the amount of restoration needed to address bird mortality that resulted from the spill. A resource equivalency analysis approach will be used. The Trustees also intend to evaluate appropriate scaling techniques to estimate the amount of restoration needed to address injuries to turtles. Given the relatively limited literature on the effects of oil on turtles and the significant number of turtles that were oiled as a result of the spill, the Trustees intend to consult with turtle experts who will focus on both the types of injuries that may have occurred and the type of restoration that may be appropriate.

### **3. Human Use Service Losses**

The Trustees have identified two key categories of human use service losses as a result of the spill and related response and remedial activities: recreational services losses and cultural losses.

#### **3.1 Recreational Service Losses**

As a result of health concerns associated with the spilled oil, on July 27, 2010, the Calhoun and Kalamazoo County Public Health Departments closed the impacted stretch of river to public use. The Michigan Department of Community Health also issued a Precautionary Public Health Advisory, reinforcing the county closure bans. As noted above, the river remains closed as of April 2, 2012, and response activities are ongoing. Due to the closure of the river, all water-based recreation activities, including swimming, motor-boating, paddling, floating, fishing, boat-based hunting, and trapping have been banned. Moreover, shoreline-based activities, such as exercising, wildlife viewing, and picnicking, have been negatively impacted because of oiling and response activities.

As a part of preassessment activities, in the days after the spill, the Trustees informally assessed human activity and recreational use/access locations along the impacted portion of the river. The Trustees also gathered and compiled readily available information on pre-spill recreational use along the affected portion of the river, including information on angling, park use, and shoreline use.

As the Trustees enter into the restoration planning phase of the assessment, they are developing a plan to assess recreational losses once the river re-opens. During the restoration planning stage, the Trustees expect to collect information on the amount of recreational activity that was affected by the spill, while also estimating the recreational use value that was lost by the public. A draft of the proposed recreational use assessment approach is attached.

#### **3.2 Cultural Losses**

Two tribal groups, the NHBP and the Match-E-Be-Nash-She-Wish Band of the Pottawatomi, are assessing potential losses that may have occurred to tribally important resources as a result of the spill. The NHBP developed a phased assessment approach. As a part of preassessment activities, the NHBP conducted preliminary interviews with tribal elders to evaluate whether further study of losses was warranted. They intend to implement the next steps of their plan in the restoration planning phase of the NRDA. The Match-E-Be-Nash-She-Wish Band of the Pottawatomi is also developing an assessment approach that they intend to implement in the restoration planning

phase of the NRDA. The Trustees recognize the culturally sensitive nature of the information being assessed, and will ensure that tribal confidentiality is respected.

## **4. Identification and Ranking of Restoration Projects**

During the restoration planning phase, the Trustees intend to finalize restoration criteria. The criteria will be based on 15 CFR § 990.54. Once criteria have been developed, the Trustees plan to gather and compile a list of restoration projects. Projects will be solicited from the general public; local, state, federal, and tribal agencies; and other organizations such as nongovernmental organizations. The identified projects will then be ranked and prioritized based on the criteria.

## **5. Standards of Performance**

The Trustees' NRDA framework describes activities that will be performed over a multi-month period in a sequential manner. Accordingly, the activities and budgets the plan outlines will be subject to modification based on information obtained during the course of the assessment, the evolution of the spill incident, and its impacts on natural resources. Because all work performed under the framework must meet high standards of professional performance and technical rigor, highly qualified and experienced experts will design and implement the work. Work products will be developed to meet or exceed generally accepted technical standards, methods, and procedures used in the field of NRDA.