



Ad-Hoc INDUSTRY

**NATURAL RESOURCE
MANAGEMENT GROUP**

FOR DISCUSSION

CASE APPLICATIONS

PFAS/NRD BEST PRACTICE APPROACH FRAMEWORK WORKSHOP

Tuesday, March 12, 2024

New York, New York

Case Application 1: Confidential PFAS Site

PFAS was discharged from a manufacturing facility into a stream. It migrated to a lake that is linked by connecting channels to a number of other lakes and a river. PFAS was discovered in fish tissue samples and a fish consumption advisory was issued. There were also concerns about drinking water contamination and the ecological effects of elevated levels of PFAS concentrations on the health of fish, birds, and mammals. This case study exposition, focuses on the evaluation of human-use service loss associated with fish consumption advisories.

Step 1: Frame the Problem

- a. The term PFAS includes thousands of chemicals
- b. Relevant PFAS was Perfluorooctane sulfonate (PFOS) o PFOS was manufactured at the facility where discharges were alleged
 - i. PFOS was present in elevated fish tissue samples that led to a fish consumption advisory in downstream waterbodies
 - ii. Distinction is important for baseline evaluation due to proliferation of unrelated PFAS's of concern

Step 2: Understand PFAS Production, Usage and Discharge

- a. Identify the extent of PFAS production and use at the site o PFOS was manufactured at the facility
 - i. Residual amounts of the manufactured PFOS was discharged into the facility's wastewater

Step 3: Identify Discharge Pathways

- a. Establish the pathways through which the PFAS of interest was discharged to the affected resources o Wastewater stream emptied into an affected lake
 - i. Initial affected lake was tied by a connecting channel to other affected lakes and a river
 - ii. Wastewater discharge migrated to the affected streams, lakes, and river and into groundwater

Step 4: Identify Receptors

- a. Fish that had elevated levels of PFOS in tissue samples
- b. Anglers who may catch, keep, and eat the fish

Step 5: Evaluate Service Loss

- a. The elevated levels of PFOS in fish tissue samples led to the issuance of a fish consumption advisory.
- b. The fish consumption advisory creates a specific link to injury for anglers who fish or would potentially fish in the affected sites.
- c. Baseline advisory characterization was important at affected sites
 - i. Some affected sites had advisories that were only for PFOS

- ii. Other affected sites had advisories for PFOS and other chemicals including PCBs, dioxins, and mercury
- d. Baseline advisory characterization was important at unaffected sites o Some of the unaffected sites had no advisory
 - i. Some had advisories for PFOS only-but not the PFOS from the manufacturing site,
 - ii. Some had advisories for PFOS, PCBs, dioxins, and mercury
- e. To isolate the effect of the site's release and therefore damages, it was important for the analysis to characterize and account for these differences

Step 6: Determine Restoration Alternatives

- a. Restoration projects focused on fishing enhancements at fishing sites that did not have a PFOS advisory
- b. The costs of restoration projects necessary to offset the service losses estimated in Step 5 represented the monetary estimate of damages

Case Application 2: Hypothetical Case

PFAS were detected in a landfill. The landfill received waste from two manufacturing facilities in the area that used PFHxA. One of those facilities also used a PFAS that is not detectable by EPA Method 537.1. The landfill also received municipal waste. PFHxA was detected in groundwater, which interacts with the lower portions of the landfill. PFHxA was also detected in surface water, sediment, and benthic organisms in a nearby stream. Drinking water wells in the area draw from a lower aquifer.