Stakeholder Perspective and Tribal Input

Several key aspects of stakeholder and tribal perspectives on the use of ISM should be considered during planning, including stakeholder and tribal engagement during systematic planning and decision-making; the value of a CSM in risk assessment and communicating risk to stakeholders and tribes; and stakeholder and tribal concerns regarding ISM in general. This section presumes familiarity with systematic planning (Section 3.1) and risk assessment (Sections 8.1 and 8.2) and provides references to those sections to avoid redundancy.

ISM can be used in various stages of site investigation, including source area identification, evaluation of fate and transport, assessment of potential exposure for risk-based decision-making, and confirmation sampling after a site has been cleaned up. The current or future use of these properties determines the level and extent of stakeholder and tribal involvement in the decision-making process. To illustrate the various applications of ISM, this section also summarizes various stakeholder and ecological considerations in ISM investigations as presented in several of the case studies found in Appendix A.

9.1 Introduction

The term *stakeholder* is broadly defined as members of environmental organizations, community advocacy groups, tribal entities, or other citizens' groups who deal with environmental issues, or a concerned citizen such as a homeowner or business owner. Members of public and private lands management organizations (state parks, national parks, and forests) and other ecological and/or protected lands (nature reserves and wildlife refuges) are considered stakeholders in the context of this section, too. The term *tribal* represents the Indian tribes, such as Pueblos, Nations, and so on; Native Hawaiians; and Alaskan Native Americans (Tlingit, Athabascan) and Native Alaskans (Yupik, Inupiat).

A vital difference between stakeholders and tribes is that tribes have government-to-government relationships with regulatory agencies, and stakeholders do not. In fact, many tribes enforce their own USEPA-approved standards. Some tribes are even developing tribal risk assessments that incorporate pathways and scenarios based on traditional and cultural routes of exposure, which in some cases are essentially and profoundly different from traditional risk assessments. Proposals to tribes that include ISM should demonstrate compliance with any tribal regulatory limits and should be part of a process that respects tribes' government-to-government status (ITRC 2012).

A differentiation is made between stakeholders and interested parties (responsible parties, state regulators, and owners and operators of contaminated sites) for discussion purposes in this section only.

9.2 Stakeholder Engagement Through Systematic Planning

Stakeholders and tribes, like interested parties, want to be assured that site investigation activities such as ISM "do no harm" and that the planned activities can effectively confirm the presence or absence of contamination. Stakeholders and tribes generally support planned activities and try to understand the processes used to characterize and/or clean up a site. During investigations, examples of questions that could be asked include, "Does soil contamination exist?" or "Why was this area sampled and why not Sampled over there?" The number one question is, "Does the contamination present an unacceptable risk?" Answering these questions requires open communication during systematic planning (Section 3.1.2 and Section 3.1.3) and throughout the project.

9.3 Communicating with Stakeholders

The pictorial representation of the CSM, such as the example in Figure 3-1, serves to illustrate the relationships among contaminant sources, fate and transport media, and exposure pathways to human and ecological receptors. In other words, the CSM presents a current understanding of the site. Communication with those involved in or affected by the site investigation and assessment of potential risk should start in the planning stage of the project, with the CSM being particularly useful in risk communication with stakeholders and/or tribes (see ITRC's Risk Communication guidance (ITRC 2020). This is a stand-alone ITRC web document by the Soil Background and Risk Team found on the ITRC website.

Establishing clear objectives at the beginning of a project is crucial to efficient and effective site investigation. The means by which these objectives are established is through the SPP, involving end users, interested parties, stakeholders, and/or tribes to help develop the CSM. The outcome of this effort is a well-thought-out DU whose locations and dimensions produce information to support all investigation questions (see Section 3.1.1).

Two primary concerns of the ISM approach, as expressed by several members of the ITRC stakeholder group, are (1) the idea of averaging away a small area of elevated contaminant concentrations and (2) ensuring that current or future populations (human or ecological) will not be adversely affected as a result of an overlooked small area of elevated contaminant concentration.

9.3.1 ISM versus discrete sampling

Concerns about sampling uncertainty relate not only to ISM but to discrete sampling approaches as well. It is important during the systematic planning stages of an ISM project that stakeholders gain a common understanding of the differences between discrete and ISM sampling, as well as how the proper use of ISM enhances the defensibility of the results in comparison to discrete sampling. Strategies for communicating technical information can be found in Section 9 of "Decision-making at Contaminated Sites: Issues and Options in Human Health Risk Assessment" (ITRC 2015). Section 8.6 discusses the key differences between ISM and traditional discrete sampling and also provides suggestions on addressing common misperceptions of ISM, including the concern stated above – that ISM averages away small areas of elevated contaminant concentration.

9.3.2 Ensuring the safety of current or future populations (human or ecological)

As stated in Section 8.2.2.1, "An *exposure area* is an area where human and ecological receptors can contact contaminants in soil on a regular basis. Examples include residential yards, school yards, playgrounds, gardens, outdoor areas of commercial/industrial properties, or other areas designated as exposure areas by other means." The ISM approach allows for targeted sampling within an EU to address these types of concerns, and the CSM provides the information upon which the DQOs and sampling plans are designed. Examples of this targeted sampling approach are seen in Figures 3-11a, 3-11b, 3-11c1, 3-11c2, and 3-11c3. As stated in Section 3.2.6.2, DQO step 4 (defining DUs), planning for the number of DUs is a decision that involves all stakeholders, but considerations for the uncertainty in risk and risk-based decisions should err on the side of protecting the public health: "Generally, practitioners would rather make the mistake of remediating a site that is already clean, than make the mistake of not remediating a site that is contaminated."

This document may prove helpful in explaining DU design during systematic planning as described in Section 3.1.5. There are times when stakeholders and tribes need a better understanding of how sampling is done and why sample locations are placed in particular locations. Sampling plans should aid these stakeholders and tribes in understanding the challenges associated with soil sampling and how ISM addresses some key uncertainties associated with it. As discussed in Section 8.2.2.1, DUs applicable to human receptors may not be applicable to ecological receptors, so when sites are evaluated for both human and ecological receptors, multiple spatial scales may need to be considered for sampling.

The key takeaway is that ISM provides better coverage with a limited number of samples and a more reliable estimate of the true mean contaminant concentration for a DU (human or ecological), thus reducing the uncertainty of the decisions that need to be made.

9.4 Case Studies

Three case studies in Appendix A provide examples of successful ISM investigations and stakeholder engagement. By acknowledging stakeholder and tribal concerns early and through systematic planning, it is possible to communicate technical investigative approaches such as ISM in an open and transparent forum. This type of communication approach can satisfy stakeholders' expectations of fairness and speaks to their concerns about risk on a level and in terms to which they can relate.

9.4.1 East Kapolei, Oahu, Hawaii

An investigation of 413 acres of former sugarcane fields in East Kapolei, on the island of Oahu, was meant to collect sufficient information to determine if areas of the property are suitable for future residential housing development. The site investigation took place between April and July 2006 and assessed the surface and subsurface soil for contaminants resulting from the application of herbicides and pesticides. The primary COCs were arsenic and dioxin.

The land is currently owned by the State of Hawaii and operated by the State of Hawaii Department of Land and Natural Resources (DLNR); the agricultural fields are currently leased for commercial fruit and vegetable cultivation. An enclosed area on the westernmost portion of the property is designated as a contingency reserve area (CRA), an environmental preserve that is monitored by the DLNR Division of Forestry and Wildlife due to the presence of endangered plants.

During the presampling site reconnaissance, the investigation team engaged the services of a land agent from the Department of Hawaiian Home Lands (DHHL) Development Division, who took the team on a tour of the site and provided historical information. At the end of the site visit, the team requested that the land agent provide contact information for the tenant farmer. The purpose of this information was to help determine farming schedules and crop rotations to avoid disturbing current operations. The tenant farmer requested that the investigation team identify the areas scheduled for sampling, and following a review of the proposed sampling areas, the tenant farmer agreed that the farming operations would not be affected by the sample collection and confirmed that the farmland in question was not scheduled for pesticide or herbicide application. The tenant farmer did request that sampling personnel attempt to avoid stepping on vines, plants, or vegetables in the fields.

The investigation team also contacted a representative with Forestry and Wildlife to discuss the CRA due to the presence of ecologically sensitive plants. Permission was given to perform sampling even if a DU extended within the boundaries of the CRA, but under certain conditions. It was requested of the investigation team that prior to scheduling sampling events, a representative from Forestry and Wildlife conduct a brief training session to help the sampling team identify the endangered plants and avoid disturbing them. Also, the Forestry and Wildlife representative requested that (1) the sampling team only do surface sampling, (2) vehicles would be prohibited from entering the area, and (3) the team needed to avoid damaging the irrigation system.

Following the pre-sampling reconnaissance with the affected stakeholders, the investigation team concluded that no change in the sampling strategy would be necessary. The sampling proceeded as scheduled.

9.4.2 Anclote Key Lighthouse, Pinellas County, Florida

The Anclote Lighthouse is a cast-iron lighthouse constructed in 1887 and located on Anclote Key, Pinellas County, Florida. The lighthouse was decommissioned as a navigation light in 1985 and is currently part of Anclote Key Preserve State Park. The park is located on a remote island and only accessible by boat; a resident park ranger lives on the site.

The paint used on the lighthouse was lead-based and has eroded and chipped over time. In the 1960s, the lighthouse became battery powered, and over the years, the casings from depleted aid to navigation (ATON) batteries were discarded near the tower or stored in buildings adjacent to the lighthouse. An initial assessment of this site was conducted in 1994, and at that time, 100 batteries were found and removed from the site. The assessment found lead and mercury in soil at concentrations above their respective cleanup target levels, thus making them COCs. The source of the mercury was presumed to be the batteries, and the lead could be from lead acid batteries or from the peeling and chipping lead-based paint.

The purpose of this ISM project was to build on the previous site investigation and support an assessment of human health risk from existing lead and mercury contamination. The primary risk considerations were public visitors to the lighthouse and the park ranger, whose residence is located on the property. A landscaped area surrounds the park ranger's dwelling.

The interaction between the site investigation team, the State Park Service, and the park ranger was not provided in the case study. Subsequent inquiries to one of the investigators from the Florida Department of Health indicated that all affected entities were affiliated with the State of Florida and were involved in the planning and implementation of the sampling strategy. The sampling strategy and subsequent site investigation were developed in partnership with investigators from the University of Florida.

Key stakeholder considerations for this ISM investigation included the following:

- The park ranger was notified prior to sampling, and there were no other family members or pets on the premises to consider.
- The park ranger cooperated with the team in setting up the investigation schedule.
- The park was closed to visitors until the investigation and subsequent mitigation were completed.
- During the investigation, there was very little disturbance to the property, and boreholes were replaced with surrounding sand/soil.
- An ecological risk assessment was conducted prior to the ISM investigation to determine if there were any risks to nesting birds and found that the investigation posed no risk to the avian population.

9.4.3 Southeast Pennsylvania

A case study about residential properties in Pennsylvania being impacted by a landfill demonstrates how ISM techniques were used to determine if properties contaminated with BaP would automatically qualify for cleanup, if the property was compliant with site-specific cleanup levels, or if additional sampling would be necessary. The determinations were specific to each residential lot, and a separate decision option was applied to every individual residential property or lot within the housing development (Owens 2020). Periodic discrete sampling had been done in the area since 1984, but it wasn't until 1999 when Hurricane Floyd hit, flooding the area under 6 ft of water, that intensive sampling and testing were initiated as part of the emergency response action. In 2001, the landfill was officially listed as a Superfund site, and the remedial investigation commenced. Initial discrete sampling of the residential properties indicated BaP values were below the USEPA cleanup level.

Since this is still an active site, the location and other identifying information is not being revealed. The site history and stakeholder engagement activities were not included in the case study, so an USEPA member of the ISM investigation team was contacted and provided the information.

The residential properties being investigated are in a neighborhood located in southeast Pennsylvania that was developed in the 1960s as part of an urban renewal project where older homes and buildings were razed and the area graded for new homes. The neighborhood consists of approximately 300 homes and lies adjacent to a landfill that existed prior to development and from which excess dirt was used as structural fill during development. It is believed that a creek ran between the landfill and the neighborhood, and that the creek was filled in during the neighborhood development as well. PCBs, PAHs, and other contaminants from the landfill were mixed in with the structural fill material along with runoff from the creek prior to being filled in.

The neighborhood formed a community advisory group (CAG) and contracted with a technical assistance grantee (TAG). Monthly and bimonthly meetings were held between the members of the investigation team, the CAG, and the TAG, where planning documents were shared and discussed among the group. Members of the investigation team gave presentations on the CSM and proposed a sampling plan. The TAG was a great resource in translating the technical information to the CAG, and the CAG agreed to the ISM sampling plan. In most cases, each home was designated a DU, and some larger properties had multiple DUs. Members from the site investigation team worked with the individual residents in developing the sampling schedule for each DU.

The most common concern expressed by the residents during the investigation was, “Why did one home in a row of six not need to be cleaned up when all the homes got flooded?’ A member of the site investigation team explained that the flood really had nothing to do with the contaminant distribution in the dirt – rather, the contaminants were already in the dirt before the flood, and the effects of soil heterogeneity and the arbitrary way the dirt was mixed and moved prior to the homes being built determined the levels of contaminant distribution. It was also explained to the residents that although all their homes had some level of contamination, the amount of contamination in some homes was below USEPA actionable levels and the reason why those particular homes did not need to be cleaned up. With the help of the TAG translating the more technical concepts, this explanation was widely accepted by the homeowners. Thirty-three homes were remediated as part of the initial emergency response action, and an additional 170 residential parcels have been remediated with an estimated 10 to 20 remaining.

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