

Alaska Commercial Fisheries Water Quality Sampling Methods and Procedures Manual

I. INTRODUCTION

This manual presents scientific water quality sampling methods to assess potential contamination of commercial fishery resources and gear in Alaska waters during an oil spill. It is intended for oil spill response personnel and fishery managers as they assess and manage the risk to commercial fisheries during spill events. The manual presents both a general discussion of factors for consideration in designing a sampling program after a spill event, and a description of specific methods and procedures.

PURPOSE OF THIS MANUAL

Oil spilled in Alaskan waters may impact the local and regional ecosystem, economy, and subsistence resources. Because of the rich and abundant commercial fisheries that occur in state waters, nearly every oil spill to Alaskan waters has the potential to impact commercial fisheries. In many spills, actual or perceived damage to the quality of commercial fisheries and seafood products is one of the most likely, and possibly most damaging, consequences.

The State of Alaska has a *zero tolerance policy* for oil or fuel contamination of food products sold for human consumption. Under state regulations (Alaska 18 AAC 34.600-34.625), vessel operators and processors are required to inspect fishing vessels, tenders, and seafood processors in the event of a known spill. Tender vessels or buying stations may not accept seafood from a vessel that has been fishing in an area where spilled oil may be present, unless that vessel has been inspected by, or received a waiver from, the Alaska Department of Environmental Conservation (ADEC) (ADEC, 2004).

In order to implement these enhanced seafood safety measures, the spatial scope of the spilled oil must be known. In addition to visual observations made during overflights, lightering, or clean-up operations, a water quality sampling program can provide more detailed information about the distribution and concentration of oil in the water. A carefully-designed water quality sampling program can provide state and federal fishery managers and food safety inspectors with valuable information, as they delineate at-risk fisheries.

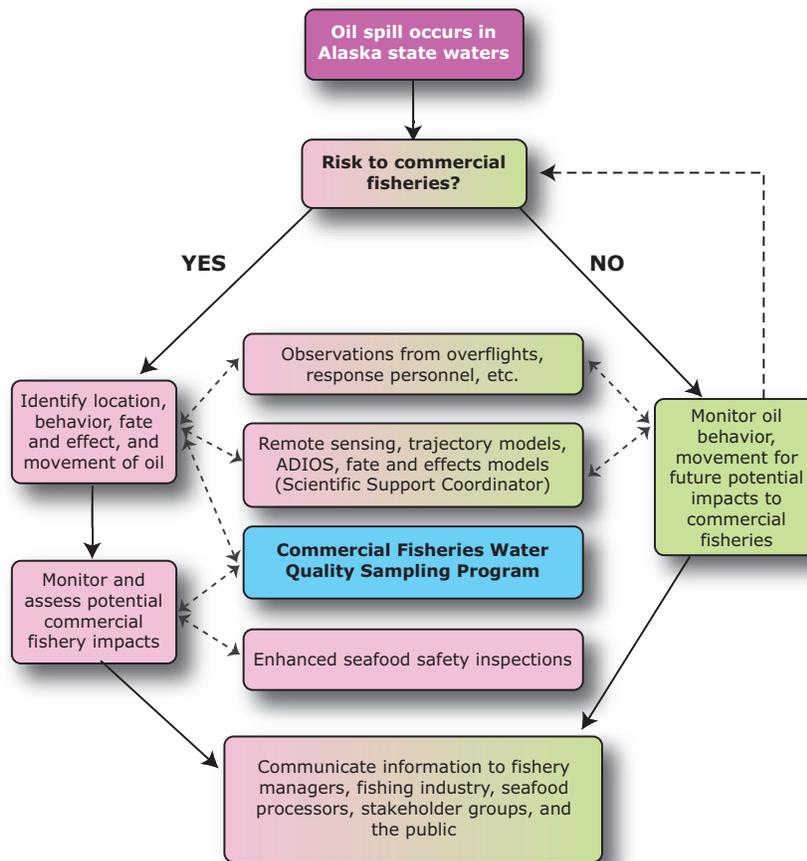
This manual describes methods and procedures to sample water, fishing vessels and gear, and fish or shellfish in order to provide spill response managers and fishery managers with data to support their decision-making.

HOW TO USE THIS MANUAL

The State of Alaska uses a two-tiered approach to prevent contamination of commercial fishery resources. The first step is to reduce or eliminate the risk of contamination by identifying where the spilled oil is and is not. The second step is to monitor harvested fish and seafood products for signs of contamination. The information in this manual will assist in accomplishing the first task - delineating the spatial and temporal scope of an oil spill so that commercial fishing vessels, seafood processors, and regulatory agencies can take the necessary actions to reduce the potential for contamination of fishery resources.

In addition to the data gathered through water quality sampling, information about the distribution, fate and effect, and potential routes of exposure of the specific oil(s) spilled should be available through the Scientific Support Coordinator. It is important that the water quality sampling program be designed with input from the incident's scientific support staff. Figure I-1 shows how the water quality sampling program fits in with the overall process of assessing and reducing risks to commercial fishery resources, gear, vessels, and processing.

Figure I-1. State of Alaska Process for Ensuring Seafood Safety Following an Oil Spill.



INTENDED USERS

Data collection should focus on providing information to the following intended users:

- **Fishery managers.** State and federal fishery managers may use sampling data to make decisions about closures of certain fisheries or areas, or to issue guidance or advisories to vessel operators or seafood processors related to additional inspection of vessels, gear, equipment, or product; changes in areas of transit, holding, or tank down; and means for reporting their own findings or staying up-to-date on the findings of the sampling program.
- **Unified Command (UC) or other response personnel.** Decision-makers in the incident management team may use data from the sampling program to assist with their clean-up operations.
- **Fishing vessels and personnel.** As disseminated through fishery managers and/or the UC, advisories and results of a sampling program will be used by commercial fishing vessel operators and aquaculture managers in their decisions to target or avoid certain geographic areas or fisheries. Sport fishers and subsistence resource users can also benefit from timely and accurate information about the presence of oil in the water and the potential for contamination.
- **Seafood processors and industry groups.** Data from water quality sampling programs may be used by seafood processors as they implement their own internal quality assurance and inspection programs. Seafood marketing organizations and other industry groups may also use sampling data to reassure consumers of the safety of seafood products.

HOW IT WAS DEVELOPED

During the 2004-2005 response to the *M/V Selendang Ayu* oil spill in Unalaska, ADEC conducted the most extensive commercial fisheries water quality sampling program to date in the State of Alaska. Through a contractor, ADEC developed, sourced, and implemented a water quality sampling program to assess potential contamination of commercial fishery resources and gear in the vicinity of Unalaska Island, and for vessels transiting to and from the Bering Sea. This information was made available for use by state and federal fishery managers and the Unified Command to anticipate and prevent oil impacts to commercial fisheries in the spill vicinity, and to communicate data regarding oil observations — or lack thereof — to stakeholders and the public.

Many of the sampling methods and equipment used during the *M/V Selendang Ayu* water quality sampling program were developed “on the fly” using improvised materials. Upon completion of the program,

ADEC noted that many of the sampling methods used in Unalaska may be applicable during spill responses in other areas of the state where commercial fishing occurs. ADEC contracted with Nuka Research and Planning Group, LLC (Nuka Research) to develop this manual in order to document the methods used in the *M/V Selendang Ayu* response. The manual describes other water quality sampling methods, as documented in published reports or as used by ADEC during past spill responses, that may be used to gather data needed to manage the risk to commercial fisheries.

The water quality sampling methods included in this manual are not exhaustive. They are meant to be used by fishery managers and spill responders as a starting point to implement a water quality sampling program. Each oil spill is different, and each commercial fishery involves different vessel types, gear types, tank configurations, and processing methods. To the extent possible, the methods described in this manual try to anticipate the data needs across a broad spectrum of fisheries in response to a variety of oil types spilled under a range of conditions. As this manual is put to use in future oil spills, additional methods or considerations may be identified that require amendments or updates to the manual. Like any planning document, the contents of this manual should be regularly reviewed and updated as appropriate.

Finally, this manual does not seek to replicate information that is already compiled in existing written documents or manuals. Existing state or federal procedures, policies, and guidelines are referenced as appropriate, but their contents are not restated.

HOW IT IS ORGANIZED

This manual begins with a discussion of how oil spilled to water may behave. Section II, Fate and Effect of Oil and Routes of Exposure to Fishery Organisms, provides a general discussion of the fate and effects of various types of oil in the marine or freshwater environment, and defines standard terminology to be used in describing oil observations collected through a sampling program. This section describes the types of impacts that may occur within a fishery when various forms of oil are present, and considers the potential routes of exposure for commercial fish species.

Section III, Considerations for Alaska Fisheries, considers the policy issues and data needs that may drive a commercial fisheries water quality sampling program. The value of sampling data lies in its ability to answer specific questions or concerns raised by spill managers, fishery managers, fishers, processors, or the public. This section addresses the potential use of a work group that brings together key decision-makers to identify and articulate policy-level concerns, and describes how those policy issues may then be inputted into a sampling program design.

Section IV, Sampling Design, describes how to develop a sampling plan that addresses the policy and practical considerations discussed in Section III. This section identifies the methods that may be used to assess the presence or absence of oil in various forms, and/or its direct impacts to fishery resources, gear, holding tanks, or processing facilities.

Section V, Fisheries Water Quality Sampling Methods, provides a how-to reference for each commercial fishery sampling method. These methods follow a standardized template and are intended for use by the Sampling Group Supervisor and sampling technicians in implementing the sampling plan. This section also addresses data recording procedures, data management, and handling and storage of collected samples.

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