RESPONSE TO THE *MOBILOIL* SPILL INCIDENT

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ABSTRACT: *Mobil Oil Corporation has long recognized the need to be prepared in the event of a large spill of oil. This paper discusses what happened when Mobil's Marine Transportation Department received word that one of its vessels had stranded in the Columbia River, releasing a quantity of oil.*

Response to the Mobiloil *incident brought together personnel from several Mobil companies in a preplanned manner. When on scene, this diverse group, previously trained, had the necessary skills and knowledge to rapidly organize to manage the spill cleanup operation. This spill response operation verified the training programs conducted by Mobil. It included the establishment of a bird rescue center, the use of company-owned communications equipment, and resulted in at least one new cleanup technique.*

These experiences are shared with the hope that others responding to a large spill may do so with confidence if the necessary planning has been accomplished and response team personnel have been provided appropriate training.

Shortly after midnight on Monday March 19, 1984 the 31,760 deadweight ton (dwt) tank vessel *Mobiloil* grounded in the Columbia River at Mile 88, approximately 10 miles downstream from Portland, Oregon. Within minutes, the Coast Guard, Mobil's Marine Transportation office in New York, and Environmental Emergency Services (EES), a cleanup contractor, were notified. It was known that at least one tank was ruptured.

Mobil engaged EES to implement the Columbia River Oil Spill Protection Plan for the protection of natural resources and to conduct cleanup operations.[5]

It was determined later that starboard wing tanks 1–5 had been breached, releasing an estimated 4,000 barrels of oil into the river. Product lost included No. 6 fuel oil, heavy residual, and industrial fuel.

Preplanning proved to be invaluable during this incident.

Initial response

Mobil Response Plans[4] have predesignated personnel and alternates with defined responsibilities. Mobil Marine managers in New York were called at home and briefed on the situation. Two Marine Transportation Department representatives were immediately dispatched to Portland. As the onboard situation was being assessed, Marine Transportation managers were enroute to their offices. Shortly after their arrival, response team members were briefed on the situation and departed by company plane for Portland.

U.S. Marketing and Refining Division (M&R) managers were notified and assistance requested from the manager, Portland Terminal. It was agreed that the M&R headquarters spill response support staff would also deploy as members of the response team.

Notification also included several Mobil M&R facilities. Some of the first to arrive on scene were those assigned to the Los Angeles region office.

All notifications were completed before dawn on the west coast. Coast Guard and EES helicopters then were airborne for first light surveillance overflights.

Organization

Mobil's manager of operations, U.S. fleet, was in charge of all on-scene activities. Captain Ken Fullwood was faced with two problems: refloat the grounded vessel without the loss of any additional oil, and clean up the oil already released.

At a Monday evening response team meeting in Portland, Capt. Fullwood briefed the team on the vessel status and his immediate plans to remove oil from the damaged tanks. Roland Miller, EES manager, briefed the team on the oil spill situation. Oil had moved 25

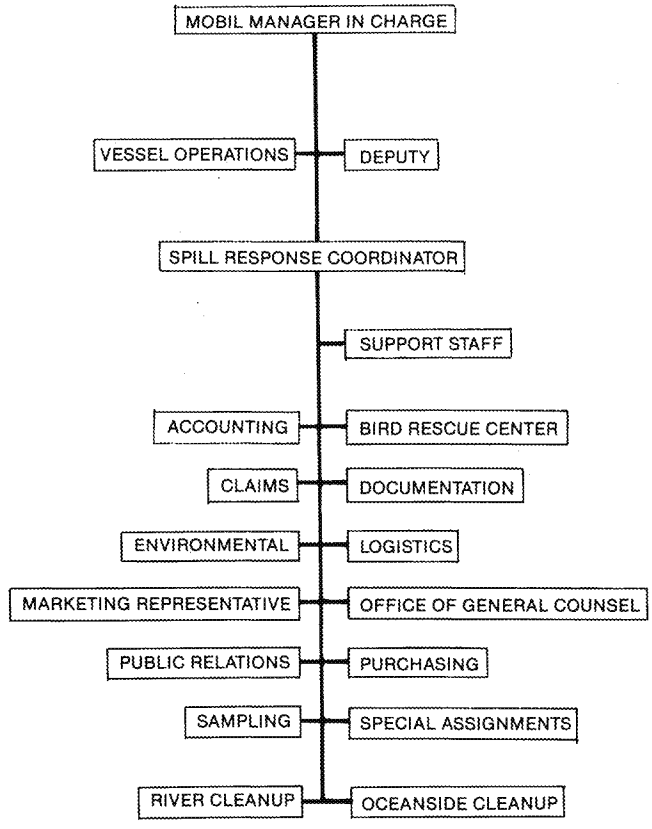

Figure 1. Response organization

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miles downstream, mainly flowing in the channel. Some sensitive areas had been boomed. It was noted that the oil was not behaving as expected.

Figure 1 shows Mobil's on-scene response organization. This organization is an outgrowth of one of Mobil's training courses, management of major spill incidents. This organization provides for specialists in each functional area as indicated. Others, not on the scene, also were active. These included aircraft operations which provided helicopter resources and the Mobil Technical Center which provided analytical services.

Outside experts were brought in to handle specialized tasks. Alice Berkner was brought in to organize the bird rescue center. Pat Brady was brought in to assist in the command post and in other capacities. A firm of local steamship agents was hired to provide local resources.

Fate of the oil

The first Mobil overflight confirmed the EES evaluation that the oil was behaving differently than expected. The oil did not impact the shoreline in the concentrations that normally would exist with heavy oil. What appeared to be thick slicks of oil mixed in with sheen was thin and easily moved with helicopter rotor wash. The only black oil was in the form of tiny specks, generally clinging to small debris. Where booms would normally be effective, oil was observed to flow easily under the boom suggesting a near neutral buoyancy condition. An unrelated spill of diesel upstream of the *Mobiloil,* occurring shortly after the grounding, may have contributed to the unexpected behavior.

Figure 2 shows the areas of primary impact. The first impact area was at the Kalama marina protective breakwater. A boom kept oil from entering the marina. The second impact area was at Cottonwood Island, the first major bend in the river, where oil was mixed with light and heavy debris along the shoreline. Immediately downstream, a natural collection area exists where oil and debris were easily boomed-in. At Longview, oil collected in heavy debris that had accumulated around a docked vessel and under the piers.

Downstream of these locations, oil impacted various areas, including several sloughs and islands. Generally, there were light concentrations of pancake-shaped tar balls 4–6 inches in diameter or smaller.

Most of the oil floating on the surface was dissipated by the time it reached the Columbia River Bar. Contamination, although slight, impacted the beaches inside of Cape Disappointment, an area of tremendous debris accumulation. Oil in the form of small tar balls, on exit from the Columbia River, moved north and impacted several areas of the Washington coast.

Some of the oil was heavier than water. Through the efforts of the National Oceanic and Atmosphere Administration (NOAA), a large mat of oil was discovered on the river bottom just downstream of the vessel. This oil, in the current shadow of the *Mobiloil,* broke loose when the *Mobiloil* was refloated and protection from the current removed.

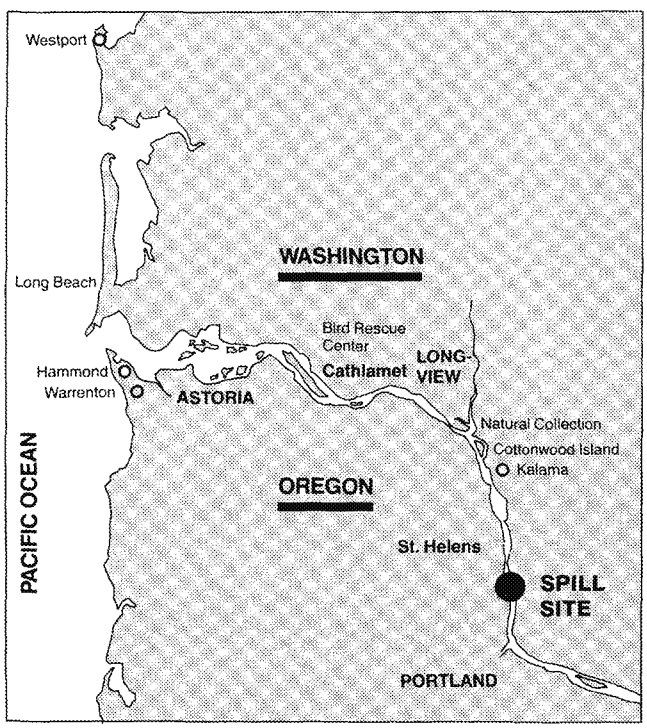

Figure 2. Areas of primary impact

Cleanup

Recovery of the spilled oil presented a number of problems:

- Accessibility to the shoreline was difficult
- The river current was in excess of 3 knots
- The cleanup area extended over 120 miles
- Large amounts of debris existed along many parts of the river
- Debris volume made disposal difficult
- Some of the spilled oil was heavier than water
- Communications were hindered by difficult terrain and distance

Even with these difficulties, Mobil had a number of factors in its favor: a large, experienced, local cleanup contractor; excellent helicopter resources; a trained Mobil response team; a good local disposal site; excellent command post facilities; a high volume river which diluted the oil; excellent coordination with the federal on-scene coordinator and his scientific support coordinator; generally fair news reporting; support from local citizenry; good cooperation from most local officials; and support from local industry. Daily helicopter overflights provided information on the location of concentrations of oil and equipment deployment sites.

EES, because of their knowledge of the river and the availability of the Columbia River Oil Spill Protection Plan, was able to deploy booms in the darkness to protect the designated resources. Booms were deployed at various inlets, sloughs, and, later, marinas. A boom also was deployed immediately downstream of the vessel, but was ineffective in the 3 knot current.

Initial cleanup was a very labor intensive operation. Most of the known recoverable oil was trapped by, and contaminated, debris. Our first efforts were to get as much oil (in the form of tar balls) and oily debris as possible into plastic bags and to remove medium sized oily debris above the high water line. Manual cleanup was conducted in all areas (Figure 3).

In most areas, workers had to be transported by boat to the cleanup sites. Safety was a concern and all were in lifejackets while in transit.

Figure 3. Manual cleanup

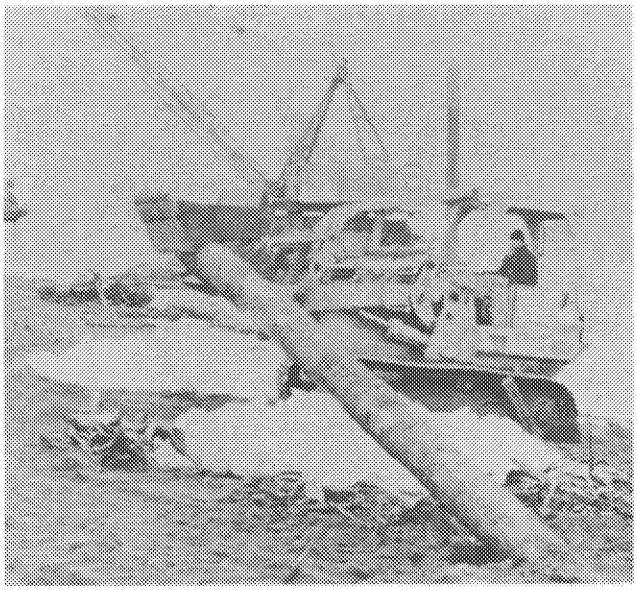

Figure 4. Heavy equipment, Cottonwood Island

In areas where very large oily debris existed, this debris had to be handled by heavy equipment. On Cottonwood Island (Figure 4) heavy equipment used included a bulldozer, barge with clamshell and a barge for receiving the oily debris. At Longview, the heavy debris could be handled from the shore. A crane with clamshell emptied each pickup into containers for later removal. These were time consuming but straightforward operations.

Cleanup under the Longview piers proved to be a challenge. Vessels moored at the dock prevented direct access. Stringers between the pilings prevented the movement of heavy debris from one section to another without manually lifting the debris over the stringers. A catwalk existed under the pier, which helped, but was about 8 feet above the water, making work from the catwalk strenuous. Working at the water's edge was no better because of the naturally slippery rocks and stringers. Two techniques overcame these problems. One was the use of aluminum scaffolding placed across the stringers and the other was the use of a cherry picker on a barge, with clamshell, that could reach horizontally under the pier. These techniques allowed for quick recovery of the entrapped oily debris and when vessels left a section of the dock, the areas were quickly cleaned and no vessels were delayed in mooring.

One area considered environmentally sensitive was slightly impacted and cleanup procedures were agreed upon between the scientific support coordinator and Mobil. A small boat with two men and sorbent material was sufficient for cleanup which was done carefully so that wildlife would not be disturbed. Another area considered sensitive was the Washington coastal beaches from the mid-tide to low-tide mark, an area of razor clam beds. All coastal beach cleanup operations took place above this area.

Special operations. Three operations associated with the *Mobiloil* cleanup are of interest. After pumping the tanks down, free of oil to the extent possible, oil mop machines were used in the vertical mode to recover the last of the oil which remained on the water in the damaged tanks.

A small amount of oil that unavoidably spilled form the damaged tanks as the *Mobiloil* was pumped off for drydocking sank to the bottom of the riverbed. After the *Mobiloil* was clear, a device[3] was rigged to recover this oil. The device was simply a reinforced wire mesh screen with sorbents secured to the bottom. The device was lowered to the bottom, allowed to sit momentarily, and hoisted back up. It was then placed over a container and the sorbents were cut loose. A second system was prepared with sorbents and the two systems were alternated to expedite recovery. This process continued until all oil was recovered.

To prevent oil from flowing out of the drydock, a screen cage was constructed and filled with sorbents. The dimensions were such that all damaged tanks were encompassed by the cage. The height of the cage was 6–8 feet. An air bubble barrier retained the small quantity of oil that escaped over the cage. Horizontal flow off the drydock overcame the air barrier at about the same time the sorbent filled cage broke the water surface and almost all of the oil from within the damaged tanks was trapped. This device was constructed with the concurrence of Paul Preuss, the patent holder.

Unusual circumstances. The Washington beaches, waterways, and air space continued to be used throughout the cleanup by residents and vacationers. This resulted in several reports of heavy patches of oil along the coast which proved to be false. The causes of both these reports were natural phenomena: one was Velella, a jelly fish; the other was an algae bloom. Both indeed resembled oil on the water.

While not as unusual as above, a circumstance that prevented any impact to the many tributaries to the Columbia River was the natural runoff of these streams. This outflow prevented any oil intrusion into these tributaries.

Disposal. Oily debris disposal proved to be major problem. Open air burning was briefly considered and rejected. Some oily debris was chipped by log chippers and burned but this was abandoned due to the sand mixed in with the oily debris. While the amount of debris was tremendous, only a relatively small amount of oil was present. The on-scene coordinator was working hard on this problem, but it was not until the State of Oregon agreed to allow use of one of their approved disposal sites that the problem was resolved. Twenty-two truck loads of lightly contaminated debris were disposed of in this manner.

Efficient portable in incinerators have been developed recently for Arctic conditions where disposal in any other manner might not be feasible.[1] These might have been very useful in this situation where adequate land was available for temporary storage and the oily debris could have been burned without any visible air pollution. These should be considered for any future operations as an alternative to other forms of disposal.

Problem areas. Oil in the water column contaminated the filters of the water intake system at one industrial facility. The system included two filters and the potential contamination problem was prevented by arranging for the filters to be cleaned as necessary, one at a time.

Hatchery ponds at a nuclear power plant were reported to have a sheen. Sorbent rolls were immediately deployed to recover the sheen and prevent further contamination.

Estimates of both quantity spilled and quantity recovered proved elusive. Since oil, oil and water mixtures, and different grades of oil were mixed during the transfer from damaged tanks to sound tanks and barges and ultimately shore tanks, early estimates of the quantity lost were very difficult to make, particularly in view of the settling time required to remove all the water from the heavier grades of oil.

The quantity of oil recovered proved equally difficult to estimate. Since most of the recovered oil was in the form of oily debris, the amount of oil recovered will never be exactly known. Initial figures reported were based on 2 gallons per 20 gallon plastic bag, but each bag contained varying amounts, and later as larger debris was recovered the accuracy of estimates became questionable.

Waterfowl rehabilitation

The founder of the International Bird Rescue Research Center was notified on the first day of the spill and shortly thereafter joined the response team. While a bird rehabilitation facility was being established, the Portland Audubon Society received and cleaned the first oiled birds captured.

Establishing a bird rescue center is a difficult logistical problem. While a site was quickly determined with the help of agency personnel, it was remote, without telephone and with water supplied from the Columbia River. Initial requirements included additional hot water capacity, pens, and bedding. The pens were constructed from plywood with sorbent rolls provided for bedding; all essential materials were initially flown in by helicopter to expedite the setup. The existing propane heater to provide additional hot water was inoperative and it was not until a new hot water heater was installed that sufficient capacity became available. The most critical problem was the water supply itself. Bird cleaning required great quantities of

clean water, and lacking the quality of water required, the rinsing and swimming operations were hindered. Relaying logistic requirements was difficult without telephones, but the problem was solved with portable radios.

The system that evolved for collecting and transporting oiled birds to the bird rescue center was effective. Initially, volunteers proceeded to the locations where birds were being held, generally by local citizens, and picked up the birds and transported them back to the center. Because of the distances involved, this quickly became inefficient. The Coast Guard agreed to collect any oiled birds brought to their stations, strategically located along the coast, and an efficient transport system was then possible.

We believe that this was one of the most extensive bird rescue operations ever undertaken. The results of the efforts of Alice Berkner and her dedicated volunteers were gratifying. Of the 450 treated, 284 were released alive and well.[2] This 63 percent success rate is one of the best ever obtained.

Public relations

Relations with news reporters were relatively good. Recognizing the need to provide factual and timely information to the news media, a three man team of public relations specialists was established. While all were available to respond to inquiries, one handled most of the vessel operations, one the cleanup operation, and one press conferences and interviews. The reporters quickly came to realize that information was available and that access would be provided to key members of the response team. Press conferences were conducted until interest declined.

The media did create one problem. Because they took a special interest in the bird rescue center operations, it became necessary to restrict access so that bird cleaning could continue unhampered. This difficulty was solved by first hosting an open house, and thereafter requiring appointments for on-site interviews and photographic coverage. The reporters understood the reasons behind these restrictions and cooperated with Mobil's request.

They also were helpful. When difficulties arose with the collection and transport of oiled birds, they published the procedures established with the Coast Guard. Further, they published a claims telephone number, which was helpful not only to Mobil but to local citizens who had questions or wanted to register a claim.

Coordination of activities

Command posts. The coordination of the many aspects of this incident was in accordance with plans. Response team members were provided with the name of the hotel for the initial response team meeting. As soon as possible, a command post was established at Longview, an excellent location for both vessel and cleanup operations. Field command posts were established, one at Kalama (later moved to Longview) and one at Long Beach.

The Mobil command post consisted of two adjacent hotel rooms with furniture cleared and the rooms set up with one as a conference/working center and the other as a communications center. The two telephones available were supplemented by running two telephones in from adjacent rooms. Across the hall, a press room was established, close for information availability but separate for quiet. Meeting rooms were available as necessary and were used for daily meetings of the response team and for press conferences. The motel staff greatly aided our operation. They quickly learned the names of response team members and would direct telephone calls to a lobby phone or into the dining room.

Field command posts were established using a leased trailer for the Kalama/Longview location and a motel on the Washington coast. These were both satisfactory. Telephones were quickly installed for the Kalama command post and later relocated when the command post location changed.

While the river field command post was located at the Kalama Marina, barricades were established to allow for safe helicopter operations.

MOBIL (ENVIRONMENTAL AFFAIRS) SPILL RESPONSE EQUIPMENT

Note: This equipment is intended for use by Mobil managers to manage a large spill and does not replace equipment available from contractors or cooperatives.

Command Post	• 8′ × 25′ selfcontained units (2) • Equipped with telephones, paging units • Equipped with typewriters and tape recorders
Portable Building	• 15′ × 20′ × 9′ fabric buildings (4)
Portable Radios	• 8 or more channel radios (48) • 6 to a box with charger
Accessories	• Aircraft convertacoms (6) • Vehicle convertacoms (12)
Specialized Communications	• Repeaters for U.S. Oil Spill Frequency • Command Consoles (base stations) (2) • UHF/VHF Crossband repeater • 55 channel marine radio • Single side band transceiver • Phone patch capability • Portable telephones • Programable scanner • Satellite communications
Inflatable Boat	• With outboard (2)
Weather Station	• Wind velocity and direction and temperature (2)
Spill Tracking Equipment	• Loran C (aircraft or vessel) • Spill Tracking Buoys (5)

Figure 5. Mobil Oil Corporation emergency spill response equipment

Communications. Radiotelephone communications were more difficult. With the *Mobiloil* 30 miles upstream and the bird rescue center 30 miles downstream, the use of portables only was inadequate. Fortunately, Mobil maintains a stockpile of spill response equipment which includes portable command posts with communications and other equipment. Communications difficulties were overcome by the installation of a repeater at a private home on a mountain top. Thereafter, we would communicate at will with both the *Mobiloil*, all river cleanup areas, and the bird rescue center. Portables were issued to all who had the need. Convertacoms were installed in vehicles and helicopters and it was a rare occasion that anyone was out of touch with the command post. The VHF network established was supplemented by marine radio for communications to the *Mobiloil*. Radios were also provided to the *Mobiloil* to assist in the control of pumping operations. Figure 5 provides a list of equipment maintained by Mobil for the use of its managers in their conduct of spill operations. This equipment is maintained at Princeton, New Jersey and is packaged for deployment worldwide.

Helicopters. Helicopters were used extensively for surveillance, logistics, and transportation. In addition to the helicopters, refueling vehicles and mechanics were available and were positioned at the Longview Airport.

Surveillance overflights of the spill area were conducted at least once daily by the respective field cleanup managers and the spill response coordinator. Ken Fullwood, in addition to his responsibilities for the refloating operation and coordination with the Coast Guard, conducted surveillance overflights as well. Many of these flights were conducted jointly with EES and federal and state agency representatives.

Logistics flights were many and varied. Almost all initial supplies for the bird rescue center were flown in. Cleanup equipment such as sorbent rolls for the fish hatchery was also delivered by helicopter.

Because of the distances between key locations, use of helicopters for transportation became necessary for the efficient use of time.

Company managers assigned to investigate reported problems did so by air. Meetings with the Coast Guard at their station in Portland were accomplished by air travel as were meetings scheduled at Long Beach.

Flights were combined where possible. A surveillance flight often included dropping off a replacement radio in one location and a person somewhere else. Coordination was accomplished by radio. An advantage of the command post location was a baseball field adjacent to the motel which was used as a landing field, allowing for the rapid deployment of personnel.

Other flights were conducted. Two specialty helicopters were used: one for night operations and the second for the final joint area inspection. The Coast Guard also conducted flights and assisted Mobil in offshore surveillance.

Agency coordination. Coordination between Mobil and federal and state agency representatives was considered excellent. Mobil immediately established liaison with the Coast Guard on-scene coordinator. While all formal contact was between the OSC and Capt. Fullwood, informal daily contact continued throughout the cleanup operations with company personnel working with their federal and state counterparts. With experienced personnel in all organizations, coordination was never lacking.

Pre-spill preparations

Mobil takes its environmental responsibilites seriously and the man-days of advance planning and training proved to be time well spent. Response plans were up to date and the predesignated personnel were not surprised when called. Almost every person had completed one or both of our training programs.

The company conducts a training program for its spill response managers titled Management of Major Spill Incidents. In this course, students are informed of spill control technology, organizational requirements for large spills, large spill response techniques and, as an exercise, prepare a spill response action plan based on observations from an actual helicopter overflight. They deploy boom and skimmers and are subjected to "real life" in a command post exercise in which a spill scenario is presented and they must organize the response operation to manage (rather than react to) the spill incident. A control team uses the telephone, radiotelephones, and roleplayers to respond to the actions of the response team and to raise problems for the team to solve. Added realism is obtained with actual Coast Guard and NOAA personnel participating in their roles as predesignated federal on-scene commander and scientific support coordinator respectively.

Field exercises also are conducted at Mobil facilities, with the actual response team assigned responding to a hypothetical spill. Participation of the Coast Guard, NOAA, state agencies, local cleanup contractors and cooperative managers adds realism to the exercise.

The very positive comments received after the *Mobiloil* spill incident concerning the company's response verifies that these training programs do enhance the preparedness of Mobil managers. The value of formal training training and field exercises is not only recognized by our management, but the management of other companies as well.

Conclusion

Adequate response to a large spill takes a great deal of advance planning by the major participants: industry, federal and state agencies, and cleanup contractors.

The response to the *Mobiloil* spill incident reflected advance planning in the following areas.

- Responsible agencies had developed a good protection plan to minimize impacts resulting from a spill.
- The cleanup contractor could respond in darkness and knew exactly what actions were proper to implement the protection plan and take advantage of natural collection sites.
- Mobil responded with trained, predesignated personnel and with the equipment necessary to properly manage the spill response effort.
- The agencies implementing the National Contingency Plan did so with trained, experienced personnel and provided assistance where appropriate.

Based on our experience, we feel that the following should be reviewed by Regional Response Teams:

- Suitability of on-site incineration using portable incinerators
- Suitability of designated disposal sites.
- Suitability of designated bird rescue centers

References

1. Potter, S. G. and E. M. Twardus, 1983. Development and testing of an air-transportable incinerator. *Proceedings of the Sixth (1983) Arctic Marine Oilspill Program Technical Seminar*
2. Personal conversation, A. Berkner
3. Personal conversation, P. C. Brady, OMS
4. Personal conversation, Mobil managers
5. Sutherland, G. Bruce, Irving W. Jones, and Randall W. Smith, 1983. Oil Spill Protection Planning for Natural Resources in Oregon. *Proceedings of the 1983 Oil Spill Conference,* American Petroleum Institute, Washington, D.C.