PRINCE WILLIAM SOUND OUT-OF-REGION OIL SPILL RESPONSE EQUIPMENT SURVEY

Report to Prince William Sound
Regional Citizens' Advisory Council
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Executive Summary

This report is a final deliverable to Prince William Sound Regional Citizens' Advisory Council (PWSRCAC) under Contract #7050.2022.01. It presents a survey of oil spill response equipment available from outside the Prince William Sound (PWS)/Gulf of Alaska region to supplement the response to an oil spill from a tanker covered under the PWS Tanker Oil Discharge Prevention and Contingency Plan (PWS Tanker Plan).

The report examines the sources of out-of-region oil spill response equipment listed in the PWS shippers' contingency plans and associated agreements listed in those plans. It examines State of Alaska requirements for contractual access to out-of-region response equipment and compares those requirements to some of the agreements listed by the plan holders.

The report also includes an inventory of equipment available from out-of-region, focusing on the feasibility of outfitting 14 Nearshore Task Forces (NSTFs). PWS tanker plan holders access spill response equipment, vessels, and personnel through direct agreements with response organizations, direct or indirect access to global equipment networks; and *ad hoc* access to government-controlled spill response stockpiles. Equipment inventories were compiled from the Worldwide Response Resource List (WRRL) and Oil Spill Removal Organization (OSRO) inventories for the following organizations: Alaska Chadux Network (ACN), Cook Inlet Spill Prevention and Response, Inc. (CISPRI); Marine Spill Response Corporation (MSRC); Alaska Clean Seas (ACS); Southeast Alaska Petroleum Response Organization (SEAPRO); Western Canada Marine Response Corporation (WCMRC); National Response Corporation (NRC), Oil Spill Response Limited (OSRL), and the U.S. Navy.

This report evaluates the out-of-region equipment availability to outfit 14 NSTFs with boom, skimmers, and primary storage devices. Based on interviews with OSROs and regulators, this analysis assumes that a given response resource provider will likely only be able to release between 25% and 50% of their total stockpile, due to regulatory limits to releasing equipment that other operators rely upon for compliance. Based on this assumption, primary storage for recovered fluids is the limiting component to outfitting NSTFs. There are adequate skimming systems if OSROs release 50% of their inventory, but if only 25% of the inventory is released, PWS Tanker Plan holders would require supplemental units from non-contracted sources. The shortfall in primary storage to support NSTFs ranges from 15 to 92 storage units, corresponding to the assumption that 50% or 25% of equipment is released.

This analysis does not factor in the availability of personnel or vessels to support 14 NSTFs but estimates that 378 vessels and over 1,000 personnel would be required to fully deploy the task forces. The process of assembling the equipment, vessels, personnel, and ancillary equipment required to operate these task forces may be time-consuming and complex.

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Acronyms

ABS	American Bureau of Shipping
ACN	Alaska Chadux Network
ACS	Alaska Clean Seas
ADEC	Alaska Department of Environmental Conservation
APICOM	Association of Petroleum Industry Co-op Managers
APSC	Alyeska Pipeline Service Company
BBL	Barrels
BPD	Barrels of Oil Per Day
CGA	Clean Gulf Associates
CISPRI	Cook Inlet Spill Prevention and Response, Inc.
EDRC	Effective Daily Recovery Capacity
EPA	Environmental Protection Agency (U.S)
GRN	Global Response Network
MOU	Memorandum of Understanding
MSRC	Marine Spill Response Corporation
NAVSUPSALV	Navy Supervisor of Salvage
NRC	National Response Corporation

NSTF	Nearshore Task Force
OSRL	Oil Spill Response Limited
OSRO	Oil Spill Removal Organization
OSRV	Oil Spill Response Vessel
PRAC	Primary Response Action Contractor
PS	Portable Skimmer
PS/BCOSTF	Pacific States/British Columbia Oil Spill Task Force
PWS	Prince William Sound
PWSRCAC	Prince William Sound Regional Citizens' Advisory Council
SEAPRO	Southeast Alaska Petroleum Response Organization
SERVS	Ship Escort Response Vessel System
SONS	Spill of National Significance
STAR	Spill Tactics for Alaska Responders
TAPS	Trans Alaska Pipeline System
WCMRC	Western Canada Marine Response Corporation
WRRL	Worldwide Response Resource List

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Final Project Report

May 2022

1 Introduction

1.1 Purpose and Scope

This report is a final deliverable to Prince William Sound Regional Citizens' Advisory Council (PWSRCAC) under Contract #7050.2022.01. It presents a survey of oil spill response equipment available from outside the Prince William Sound (PWS)/Gulf of Alaska region to supplement the response to an oil spill from a tanker covered under the PWS Tanker Oil Discharge Prevention and Contingency Plan (PWS Tanker Plan).

The report includes background on the legislative and regulatory requirements that establish standards for oil spill equipment availability and identifies the contracts in place to assure access to sufficient equipment to meet State of Alaska planning standards. The report also considers whether there are additional measures needed to formally release equipment from out-of-region to support a PWS spill response.

The report includes an inventory of equipment available from out-of-region, focusing on the feasibility of outfitting 14 Nearshore Task Forces with boom, skimmers, and primary storage devices.

1.2 Background

PWS Tanker Operators

Five shipping companies operate tankers in Prince William Sound, transporting Alaska North Slope crude oil from the Valdez Marine Terminal. Current operators are: Alaska Tanker Company, LLC; Andeavor, LLC (a wholly owned subsidiary of Marathon Petroleum Corporation); Crowley Alaska Tankers, LLC; Hilcorp North Slope, LLC; and ConocoPhillips/Polar Tankers, Inc. State of Alaska regulations require that tanker operators have in place oil discharge prevention and contingency plans to demonstrate their ability to

contain, control, and clean up an oil spill as quickly as possible.[1] The tanker operators are also subject to federal oil spill response planning requirements.[2]

To comply with state and federal oil spill contingency planning regulations, Prince William Sound tanker operators file plans with the Alaska Department of Environmental Conservation (ADEC) and the U.S. Coast Guard. The State of Alaska Prince William Sound Tanker Oil Discharge Prevention and Contingency Plan (PWS Tanker Plan) is comprised of a core plan and spill response technical manual (Alaska Tanker Company, 2022a and 2022b), supplemented by individual plans filed by the tanker operators (Andeavor, LLC., 2022; Alaska Tanker Company, LLC., 2021; Polar Tankers, Inc., 2022a and b; Hilcorp North Slope 2022; Crowley Alaska Tankers, LLC, 2022). The core plan and technical manual contain common information across the five tanker operators and list the equipment inventory and contractual relationships in place to supply equipment and personnel to respond to oil spills in Prince William Sound. Individual tanker plans include additional information about equipment inventories and contractual arrangements.

In-Region and Out-of-Region Equipment Requirements

Alaska statute and regulations[3] require tankers operating in the Trans Alaska Pipeline System (TAPS) trade to have available within their region of operation sufficient equipment available to clean up a 300,000 barrel oil spill in 72 hours.[4] To comply with state regulations, oil spill contingency plans must identify Primary Response Action Contractors (PRAC)[5] and provide contact information along with information about the equipment and services they provide.[6] In addition to in-region equipment, Alaska statutes and regulations[7] require that tankers have access to additional resources to respond to a realistic maximum discharge[8] from a PWS tanker in the shortest time possible. Based on the 2022 approved PWS Tanker Plan, the realistic maximum oil discharge volume from the largest trade tanker (less prevention credits) is 546,147 barrels (Alaska Tanker Company, 2022a).

If out-of-region equipment is listed in a State approved contingency plan and obtained from another region in Alaska (e.g., another Alaska-based PRAC) ADEC must approve the request to transfer resources according to criteria listed in regulation.[9] There may be other requirements imposed within contracts and mutual aid agreements that require

[1] 18 AAC 75 Article 4.
[2] 33 CFR 155.
[3] AS 46.040(k)(3)(B) and 18 AAC 75.438(a).
[4] AS 46.040(k)(3)(B) and 18 AAC 75.438(a).
[5] PRAC is a State of Alaska certification for oil spill cleanup contractors similar to the federal Oil Spill Removal Organization (OSRO) certification.
[6] 18 AAC 75.445(i).
[7] Defined in AS 46.04.030(k)(3)(C) and 18 AAC 75.438(c) as 60% of the total cargo volume of the tank vessel.
[8] Defined in AS 46.04.030(k)(3)(C) and 18 AAC 75.438(c) as 60% of the total cargo volume of the tank vessel.
[9] 18 AAC 75.470.

equipment release from out-of-state inventories (BC States Task Force, 2011; Alaska Tanker Company, 2022b).

Acquisition Surveys

Out-of-region equipment access has been an ongoing issue since the first approval of the PWS Tanker Plan. During the 1995 PWS Tanker Plan approval process, ADEC required that the plan holders complete an Acquisition Survey to demonstrate their ability to meet the out-of-region equipment requirement. They did not require these surveys to include contracts to demonstrate access to this equipment (ADEC, 1995). To comply with this directive, former PWS Tanker Plan holders SeaRiver Maritime, Inc. and ARCO Marine Inc. submitted out-of-region equipment surveys to ADEC (Hartec, 1995 a,b). Follow-up studies were conducted by plan holders in 2002, 2006, 2011, and 2018 (Ploen and Maunder, 2002; Ploen; 2006; Ploen, 2011; and Ploen, 2018).

In addition to out-of-region equipment surveys conducted by PWS plan holders, PWSRCAC conducted periodic, independent out-of-region equipment studies in 1997, 2001, 2002, and 2007 (Gilpatrick and Jones, 1997; Gundlach and Reiter, 2001; Gundlach, 2002 and Gundlach, 2007). This report updates PWSRCAC's previous work on this topic using a slightly different approach focused on task force assembly, as explained in Section 3.2.

Nearshore Task Forces

The PWS Tanker Plan identifies 19 total Nearshore Task Forces (NSTFs) to meet the response planning standard. The plan indicates that NSTFs 1-5 will be resourced with in-region equipment, while NSTFs 6-19 will be resourced with out-of-region equipment. Therefore, this analysis focuses on these 14 NSTFs and the availability of key equipment from outside of PWS to outfit them.

2 Access to Out-of-Region Response Equipment

2.1 State Requirements

The State of Alaska out-of-region equipment requirement specifies that plan holders "shall plan to have deployed and operating within 72 hours, from within or outside its region of operation, sufficient oil discharge containment, storage, transfer, and cleanup equipment, personnel, and other resources to contain and control…" at least 60% of the total cargo volume.[10] Plan holders describe their planning in their contingency plans and many of them identify supplementary response contractors whose equipment would be cascaded in from Alaska and beyond to meet this standard.

[10] 18 AAC 75.438(c).

Alaska regulations at 18 AAC 75.445(i) require that plan holders who rely on PRACs[11] to meet state response planning standards provide:

> "a statement signed by the plan holder and the primary response action contractor attesting to the department that the contract clearly specify that the contractor is obligated to: (A) provide the response services and equipment listed for that contractor in the contingency plan; (B) respond if a discharge occurs; (C) notify the plan holder immediately if the contractor cannot carry out the response actions specified in the contract or the contingency plan; (D) give written notice at least 30 days before terminating its contract with the plan holder; (E) respond to a department-conducted discharge exercise required of the plan holder; and (F) continuously maintain in a state of readiness, in accordance with industry standards, the equipment and other spill response resources to be provided by the contractor under the contingency plan."

2.2 Equipment Access Arrangements

There are several mechanisms for PWS Tanker Plan holders to access spill response equipment, vessels, and personnel. These include:

- direct agreements between a tanker operator and a spill response organization;
- direct or indirect agreements to access to global equipment networks; and
- *ad hoc* access to private or government-controlled spill response stockpiles.

Direct Agreements

The ADEC certifies oil spill PRACs to meet state regulations. Alyeska Pipeline Service Company's Ship Escort Response Vessel System (APSC/SERVS) is the primary PRAC for PWS tanker owners, operators, and charterers who are signatories to the Agreement for Oil Spill Response Services with APSC/SERVS. APSC/SERVS has a memorandum of understanding (MOU) with Cook Inlet Spill Prevention and Response, Inc. (CISPRI) and is a member of Alaska Clean Seas (ACS) giving all PWS Shippers access to CISPRI and ACS inventories. PWS Shippers have direct access to response equipment through primary contracts with oil spill removal organizations (OSROs), dedicated spill response companies that maintain an inventory of spill response equipment, vessels, and personnel. Alaska also certifies oil spill PRACs to meet state regulations.

In addition to their contracts with APSC/SERVS, PWS Shippers have various direct agreements in place with other Alaska-based PRACs, with OSROs in the Lower 48, and with global response contractors. APSC/SERVS also has arrangements in place with U.S. and international response organizations to access their equipment and these extend to the

[11] PRAC is defined in AS 46.04.035. (h)(2) as "a person who enters into a response action contract with respect to a release or threatened release of oil and who is carrying out the contract, including a cooperative organization formed to maintain and supply response equipment and materials that enters into a response action contract relating to a release or threatened release of oil."

tanker operators with APSC/SERVS contracts. Table 2-1 PWS Tanker Plan Holder Contractual Agreements summarizes these agreements.

Equipment-Sharing Networks

Another mechanism for accessing spill response equipment is through network organizations, which are consortia made up of individual oil spill removal organizations that enter into mutual aid agreements potentially providing access to share resources across spill response organizations. The networks to which some or all the PWS Shippers have a nexus are: the Association of Petroleum Industry Co-op Managers (APICOM); the Alaska OSRO MOU; and the Global Response Network (GRN).

Association of Petroleum Industry Co-op Managers (APICOM) MOU

There is a MOU among the APICOM members to coordinate and share oil spill response resources (APICOM, 2014). The following OSROs[12] are signatories to this MOU:

- Alaska Chadux Network (ACN)
- Alaska Clean Seas (ACS)
- Clean Channel Association[13]
- Clean Gulf Associates (CGA)[14]
- Clean Harbors Cooperative[15]
- Clean Island Council[16]
- Clean Rivers Cooperative[17]
- Clean Seas[18]
- Cook Inlet Spill Prevention & Response, Inc. (CISPRI)
- Corpus Christi Area Oil Spill Control Association[19]
- Delaware Bay and River Cooperative[20]
- Oil Spill Response, Limited USA (OSRL-USA)[21]

[12] Primary location of OSROs outside of Alaska are identified in footnotes.
[13] Texas
[14] Louisiana
[15] New Jersey
[16] Hawaii
[17] Oregon
[18] California
[19] Texas
[20] Pennsylvania
[21] Florida

PWS Tanker Plan holders that have contractual arrangements with one or more of the cooperatives listed above may be able to access equipment through the APICOM network.

The MOU states that upon request, a party to the MOU will provide information about available response resources and a rate schedule. It does not obligate any party to provide equipment. Therefore, it does not meet the State standard at 18 AAC 75.445(i) of clearly specifying that the contractor is obligated to provide the response services and equipment and respond if a discharge occurs.

Alaska OSRO MOU

An equipment-sharing MOU (Alaska OSRO, 2013) is also in place among five Alaska OSROs:

- ACN,
- ACS,
- APSC/SERVS,
- CISPRI, and
- Southeast Alaska Petroleum Response Organization (SEAPRO).

PWS Tanker Plan holders that have contractual arrangements with one or more of the Alaska OSROs listed above may be able to access equipment through the Alaska OSRO MOU. The ADEC must approve any equipment release requests.

Like the APICOM MOU, this agreement provides a mechanism for OSROs to request access to one another's inventories but does not guarantee the availability of equipment. Thus does not meet the 18 AAC 75.445(i) standard of obligation.

Global Response Network (GRN)

The GRN describes itself as a "collaborative group of companies from around the world that specialize in oil spill response." The network exists to "share information, improve spill response performance and provide centers of expertise in spill preparedness, response, and recovery techniques." Members must be industry-funded response organizations. Its current membership includes:

- ACS,
- the Australian Marine Oil Spill Centre,
- CGA,
- Eastern Canada Response Corporation,
- Marine Spill Response Corporation (MSRC),
- Norwegian Clean Sea Association for Operating Companies,
- Oil Spill Response Limited (OSRL), and
- Western Canada Marine Response Corporation (WCMRC).

The GRN website does not provide details about equipment or resource-sharing among members but implies that this may take place. As with other MOUs, this agreement does not meet the 18 AAC 75.445(i) standard for obligation.

Commercial Ventures

The Polar Tankers contingency plan identifies several contractors that are characterized as "commercial ventures" through which spill response resources may be procured without a contract. These include:

- Marine Pollution Control,
- National Response Corporation (NRC),
- Qualitech Environmental,
- SWS Environmental Services, and
- Unitech of Alaska.

While commercial response equipment may supplement a response, identifying such organizations in a contingency plan does not comply with state regulations.[22]

Government Equipment Stockpiles

State and federal agencies also maintain stockpiles of oil spill response equipment and, in some cases, this may be accessed to supplement a response. Unlike contracted resources, there are no mechanisms for plan holders to pre-arrange access to government equipment stockpiles. For federal government stockpiles maintained by the U.S. Coast Guard and Navy Supervisor of Salvage (NAVSUPSALV), equipment access is determined by the Federal On-Scene Coordinator, the lead federal agency (U.S. Coast Guard for marine spills and Environmental Protection Agency (EPA) for inland spills) represented in Unified Command.

The State of Alaska also maintains spill response equipment and is party to the Pacific States/British Columbia Oil Spill Task Force (PS/BCOSTF) Mutual Aid Agreement (PS/BCOSTF, 2011) that includes the U.S. states of Alaska, Hawaii, Washington, Oregon, and California as well as the Province of British Columbia, Canada. The agreement creates a structure for west coast states/provinces to request response resources from one another during an oil spill. The request must come through the Unified Command on behalf of the State On-Scene Coordinator. Several states have identified limitations to how much equipment they may release, in order to maintain sufficient in-region capacity.

While government response equipment may supplement a response, identifying such organizations in a contingency plan does not comply with state regulations.[23]

[22] 18 AAC 75.445(i).
[23] 18 AAC 75.445(i).

Equipment Access Matrix

Table 2-1 is a matrix summarizing the existence and nature of equipment access in place based on the 2022 approved PWS Tanker Plan (Alaska Tanker Company, 2022a and 2022b) and individual vessel plans (Andeavor, LLC., 2022; Alaska Tanker Company, LLC., 2021; ConocoPhillips/Polar Tankers, Inc., 2022a and b; Hilcorp North Slope, 2022; Crowley Alaska Tankers, LLC, 2022).

Boxes shaded in green indicate that a direct contract is in place, because the relevant contingency plan either includes a copy of the contract or agreement or a statement of contractual terms. Boxes shaded yellow indicate a possible contract, because the resource organization is mentioned in the contingency plan, but there is no direct evidence that a contract is in place to meet the regulatory standard in 18 AAC 445(i). Boxes shaded blue are commercial or government equipment that a plan holder may be able to access, but for which no contractual arrangement exists.

Table 2-1. PWS Tanker Plan Holder Contractual Agreements

Key:		= **Direct Contractual Access, likely meets 18 AAC 75.445(i) standard.**
		= **Possible Access, listed in plan but no evidence of contractual obligation.**
		= **Commercial or Government, no contractual obligation.**
APICOM APICOM MOU	**AK** Alaska OSRO MOU	**GRN** Global Response Network

DIRECT AGREEMENTS						
Agreement Between:	**Polar Tanker**	**Andeavor**	**Crowley**	**Alaska Tanker**	**Hilcorp**	**APSC/ SERVS**
APSC/SERVS **AK**						N/A
ABS Rapid Response						
Alaska Clean Seas **APICOM, AK, GRN**						
Alaska Ventures						
Ardent America						
ASRC Energy Services						
Alaska Chadux Network **APICOM, AK**						
Cook Inlet Spill Prevention & Response, Inc. **APICOM, AK**						
Clean Channel Association **APICOM**						
Clean Gulf Associates **APICOM, GRN**						
Clean Harbors Co-op **APICOM**						
Clean Island Council **APICOM**						
Clean Rivers Co-op **APICOM**						
Clean Seas **APICOM**						
Cordova District Fishermen United						
Crowley Maritime Corporation						
CTEH						
Delaware Bay Co-op **APICOM**						
Donjon-SMIT						

Key:	= **Direct Contractual Access, likely meets 18 AAC 75.445(i) standard.**
	= **Possible Access, listed in plan but no evidence of contractual obligation.**
	= **Commercial or Government, no contractual obligation.**

APICOM APICOM MOU AK Alaska OSRO MOU GRN Global Response Network

DIRECT AGREEMENTS						
Agreement Between:	**Polar Tanker**	**Andeavor**	**Crowley**	**Alaska Tanker**	**Hilcorp**	**APSC/ SERVS**
Edison Chouest Offshore						
Gallagher Marine Systems						
Global Diving						
International Bird Rescue						
International Wildlife Research						
J&S Maritime						
Lounik, Inc.						
Marine Pollution Control						
Marine Spill Response Corporation GRN						
North Star Terminal and Stevedore Co.						
Northern Land Use Research Alaska, LLC						
National Response Corporation						
O'Briens Response Management						
Oil Spill Response USA/Oil Spill Response Limited APICOM, GRN						
Polar Tanker Spill Response Company						
Polaris Applied Sciences						
Qualitech Environmental						
SEAPRO AK						
Stericycle						
SWS Environmental Services						
T&T Salvage						
TCC, LLC						
The Response Group						
U.S. NAVSUPSALV						
Unitech of Alaska						
Univar						
U.S. Coast Guard (various)						
Valdez Fisheries Development Association						
Western Canada Marine Response Corporation GRN						

2.3 Considerations for Out-of-Region Equipment Access

Access through Direct Contract with OSROs

Table 2-1 shows that all the PWS Shippers describe contractual relationships with APSC/SERVS and MSRC. It also shows that APSC/SERVS has several additional arrangements in place with other response resource providers, including ACS and CISPRI. The core equipment contracted by all five shippers is the APSC/SERVS in-region inventory, Alaska OSRO in- and out- of region inventory (ACS and CISPRI), and MSRC out-of-region inventory. Polar Tankers, Andeavor, and Alaska Tanker Company also have contractual access to OSRL's equipment inventory (out-of-region). Alaska Tanker Company describes a contract with WCMRC in British Columbia, but the prospect of mobilizing response resources over international boundaries can create additional challenges. Plan holders describe additional contracts with smaller providers or with contractors that provide specific services such as wildlife response or scientific support.

It is important to note that plan holder access to out-of-region equipment does not mean that the full inventory of any one organization is available. OSROs are limited in the extent to which they can release equipment to a single incident as this equipment is the basis for multiple operators to meet their federal and state oil spill preparedness requirements. In Alaska, ADEC must approve the release of response equipment from one response contractor to another. State and federal regulators may also be required to approve the release of contractor equipment to another state. Access to WCMRC and OSRL international inventories may be further complicated by customs requirements for moving equipment across an international border.

Past equipment surveys by PWS plan holders and PWSRCAC have taken into consideration the full inventory of response equipment maintained by out-of-region response organizations. However, based on interviews with OSRO managers, response personnel, and regulators, it is not realistic to expect that any organization, regardless of contractual arrangement with the PWS plan holders, would be permitted by state and federal authorities to release their full equipment inventory. Therefore, this analysis assumes that PWS plan holders would likely have access to between 25-50% of the total equipment inventory of any given out-of-region response organization. We recognize that there may be exceptions to this range but feel that it is more realistic for planning purposes.

Access through MOUs and Equipment Networks

Table 2-1 includes oil spill response organizations that participate in one or more of the three equipment networks: APICOM; Alaska OSRO MOU; and GRN. The APICOM and Alaska MOUs are nearly identical in their wording and both contain the following clause:

> ***"Third Party Reliance:*** *This MOU and the Response Resource sharing contemplated hereunder may be communicated to third parties. However, this MOU shall not be construed to be for the benefit of any third party, nor shall a non-Party have any right to enforce any of its provisions. Moreover, execution of this MOU may not be construed to*

> *mean that any of the Response Resources identified are necessarily available for purposes of meeting a particular state or federal response-planning standard."*

Neither APICOM, nor the Alaska OSRO MOU is a binding agreement and neither one guarantees access to equipment. Therefore, PWS Tanker Plan holders cannot necessarily access the out-of-region equipment inventories available through APICOM or the Alaska OSRO agreement, unless they also have direct agreements in place.

The GRN includes ACS and MSRC. All PWS Tanker Plan holders have access to ACS through APSC/SERVS and have contracts in place with MSRC. Beyond these arrangements, there is no evidence that PWS Tanker Plan holders have contractual access to the other GRN member entities.

Commercial Ventures and Government Equipment

The commercial ventures and government stockpiles listed in Table 2-1 are not necessarily available to support a PWS tanker spill response and the plan holders have no control over whether federal or state authorities might release equipment to support a response.

3 Out-of-Region Equipment Analysis

3.1 Summary of Resources

Inventories of out-of-region response equipment were compiled and analyzed to better understand the capabilities and limitations of out-of-region resources to support a PWS tanker spill response, and specifically to build 14 NSTFs.

The Worldwide Response Resource List (WRRL) was the primary source for out-of-region equipment inventories. The WRRL is an oil spill response equipment database that is available online to download or query.[24] It includes several of the OSROs and PRACs that are listed in contingency plans as providing out-of-region equipment to PWS Shippers. The following equipment lists were compiled from the WRRL for analysis: CISPRI; MSRC (California, Northwest, Gulf, Hawaii, Atlantic); SEAPRO; WCMRC; NRC (California, Hawaii, Northwest); and NAVSUPSALV. Response organizations are responsible to update their equipment lists through the WRRL and this study presumes that these inventories are up-to-date and accurate.

The WRRL does not include ACS, ACN, or ORSL's equipment inventories; these were compiled separately and combined with the WRRL data. Information from the WRRL and other equipment inventories was taken at face value with no further validation. A logical next step would be to verify the accuracy of these equipment inventories.

Equipment Type and Kind

The WRRL applies a standard "type and kind" categorization to response resources that range from air monitoring to wildlife. For this analysis, we focused on three types of

[24] https://wrrl.world/fmi/webd/WRRL.

response resources: boom, skimmers, and storage. The WRRL type and kind specifications for these three resources are shown in Table 3-1. Shaded rows indicate the type/kind of resources that were analyzed for the out-of-region task forces; other type/kinds of boom, skimmers, and storage options which are not appropriate for nearshore operations are not shaded.

Table 3-1. WRRL Kind/Type Resources for Boom, Skimmers, and Storage

Resource	Kind	Kind/Type	Type Parameters	Description	Example
Shading indicates type/kind included in NSTF analysis.					
Boom	Boom (B)	Boom-B-1	height > = 42" or > = 104 centimeters (cm)	Non-specific boom that is capable of operating in large waves, foam crests, and some spray.	Non-specific
Boom	Boom (B)	Boom-B-2	height > =18 < 42" or > = 46 cm < 104 cm	Non-specific boom that is capable of operating in moderate waves and frequent whitecaps.	Non-specific
Boom	Boom (B)	Boom-B-3	height < 18" or < 46 cm	Non-specific boom that is capable of operating in small non-breaking waves.	Non-specific
Boom	Fire (Bfire)	Boom-Bfire-0	fire boom of any height	Boom that includes both fence and curtain type designed to withstand the heat and stress of in situ burning.	PyroBoom 30”
Boom	Tidal Seal Boom (TS)	Boom-TS-0	Booms that use air or foam for buoyancy and water for ballast.	Not otherwise specified.	Tidal seal boom
Skimmer, Portable	Boom (BO)	Skimmer-BO-0		Includes any device that has the skimmer incorporated in the face of the containment boom, regardless of the skimmer type.	Boom skimmer
Skimmer, Portable	Portable Skimmer (PS)	Skimmer-PS-1	> 9,600 barrels of oil per day (bpd)	Portable Skimmer, > 417 barrel per hour (bbl/hr) or 66 cubic meters (m3)/hr pump capacity	Douglas Skim-Pak-93, DIP-2900
Skimmer, Portable	Portable Skimmer (PS)	Skimmer-PS-2	> = 2,880, < 9,600 bpd	Portable Skimmer, > 120 bbl/hr or 19 m3/hr, < 417 bbl/hr or 66 m3/hr pump capacity	Kepner SeaVac-660, RoDisc 15
Skimmer, Portable	Portable Skimmer (PS)	Skimmer-PS-3	> = 480, < 2,880 bpd	Portable Skimmer, > 20 bbl/hr or 3 m3/hr, < 120 bbl/hr or 19 m3/hr pump capacity	Walosep WM, Slickbar SLURP, Lori

Resource	**Kind**	**Kind/Type**	**Type Parameters**	**Description**	**Example**
Skimmer, Portable	Portable Skimmer (PS)	Skimmer-PS-4	< 480 bpd	Portable Skimmer, < 20 bbl/hr or 3 m3/hr pump capacity	VAB Foxtail Rope Skimmer, Aquaguard
Storage	Portable Storage (PS)	Storage-PS-1	> 2,000 bbl or 231 m3	Portable (tank) storage	Storage Bladder
Storage	Portable Storage (PS)	Storage-PS-2	> 500 bbl or 58 m3 < 2,000 bbl or 231 m3	Portable (tank) storage	Storage Bladder
Storage	Portable Storage (PS)	Storage-PS-3	> 200 bbl or 23 m3 < 500 bbl or 58 m3	Portable (tank) storage	Baker Tank
Storage	Portable Storage (PS)	Storage-PS-4	< 200 bbl or 23 m3	Portable (tank) storage	8.5 bbl Poly Tank

3.2 Nearshore Task Force Analysis

Task Force Composition

Scenario 546 on page 69 of the PWS Tanker Plan, Revision 0. 2022 (Alaska Tanker Company LLC. 2022a) sets out the need for 14 NSTFs. The APSC/SERVS Technical Manual specifies that each out-of-region NSTF would be comprised of six skimmers, 7,500 feet of boom, and 12 suitable storage devices of 100 barrels (bbl) each, with the specifications shown in Figure 3-1 (Alaska Tanker Company, 2022b).

Figure 3-1. Nearshore Task Force Equipment Specifications from SERVS Technical Manual

Table 12.3-8. Out of Region Nearshore Task Forces

Nearshore Task Force	Equipment Per Task Force
TF 6, 7, and 8	6 ea. GT185/DESMI 250 skimmers or equivalent 7,500 ft boom appropriate for assigned tasks 12 ea. suitable storage devices or equivalent (100 bbl per device)

Equipment availability through contractual, commercial, and government response resource inventories was analyzed based on the access described in Table 2-1. Resources such as personnel, vessels, pumps, hoses, and ancillary equipment were not factored into the analysis, but are important to task force assembly.

Approach

The modified WRRL database analyzed for this report contains:

- 1.2 million feet of type B-2 boom,
- 564 type PS-3 skimmers, and
- 550 marine compatible type PS-2, PS-3, and PS-4 primary storage devices.

It cannot be assumed that the PWS Shippers have complete access to all of the equipment in this worldwide inventory. To assess the availability of out-of-region equipment for 14 NSTFs, a spreadsheet model was used to calculate equipment availability from the PRACs and OSROs identified in Table 2-1 as having contractual relationships with the PWS Shippers. Three levels of access were prioritized based on contractual relationships: (1) through directly contracted organizations; (2) through listed organizations; and (3) through government and commercial vendor stockpiles. We focused on the first level of access and only progressed through the second and third if the out-of-region equipment requirement could not be met.

For each of the three categories of equipment type/kinds (boom, skimmer, and storage), two different assumptions were applied to reflect that no single response organization would release 100% of their inventory. The availability of out-of-region equipment is estimated based on 25% and 50% of total inventory for each out-of-region supplier.

Availability of Out-of-Region Boom

The estimate of boom availability for out-of-region NSTFs began with Boom B-2, which ranges from 18 to 42 inches. To outfit 14 task forces with 7,500 feet apiece, a total of 105,000 feet of boom is required.

Table 3-2 shows the availability of out-of-region boom. Assuming that response organizations are permitted to release 50% of their inventory, there is sufficient boom available through CISPRI, MSRC in California and the Northwest, and ACS to provide 119,953 feet of B-2 boom, or 114% of the requirement for 14 NSTFs. If the assumption is reduced to 25% of total inventory, B-2 boom available through the previous four OSROs plus MSRC in the Gulf, Atlantic, and Hawaii regions and ACN can supply 108,562 feet of boom, or 103% of the required boom for 14 NSTFs.

All of the PWS Tanker Plan holders describe contractual access to CISPRI and MSRC out-of-region equipment. APSC/SERVS has direct contractual access to CISPRI and ACS equipment, and ACN equipment is not contractually obligated.

Table 3-2. Availability of Boom (B-2, 18"-42") to outfit 14 Nearshore Task Forces

Source	Feet of B-2 Boom *(Max Withdrawal 50%)*	% of total		Feet of B-2 Boom *(Max Withdrawal 25%)*	% of total
CISPRI	9,294	9%		4,647	4%
MSRC-CA	53,200	51%		26,600	25%
MSRC-NW	37,330	36%		18,665	18%
ACS	20,129	19%		10,065	10%
MSRC-GULF				4,075	4%
MSRC-ATL				7,498	7%
MSRC-HI				5,835	6%
ACN				31,178	30%
Total Boom Needed (feet)	105,000			105,000	
Total Boom Acquired (feet)	119,953	114%		108,562	103%

Accessible through contracted organizations
Accessible through listed organizations
Accessible through governmental or commercial organizations

Availability of Out-of-Region Skimmers

To estimate the availability of skimmers for out-of-region NSTFs, the analysis included skimmers PS-3, which range in Effective Daily Recovery Capacity (EDRC) from 480 to 2,800 bdp. To outfit 14 task forces with six skimmers each, a total of 84 skimmers are required.

Table 3-3 shows the availability of out-of-region skimmers. Assuming that response organizations are permitted to release 50% of their inventory, there are enough PS-3 skimmers with excess skimming capacity available through CISPRI, MSRC in California the Northwest, and the Gulf, and ACS. These four OSROs can provide 89 PS-3 skimming units to meet 105% of the skimming requirement for 14 NSTFs.

If the assumption is reduced to 25% of total inventory, PS-3 skimmers available through the previous five OSROs plus MSRC in the Atlantic and Hawaii regions, ACN, NRC in the Northwest and California, and OSRL-USA regions can supply 84 PS-3 skimmer units to meet 100% of the skimming requirement for 14 NSTFs.

All of the PWS Tanker Plan holders describe contractual access to CISPRI and MSRC out-of-region equipment. APSC/SERVS has direct contractual access to CISPRI and ACS equipment. ACN, NRC, and OSRL are not contractually obligated to provide equipment to every plan holder.

Table 3-3. Availability of Skimmers (PS-3) to outfit 14 Nearshore Task Forces

Source	Units *(Max Withdrawal 50%)*	% of total		Units *(Max Withdrawal 25%)*	% of total
CISPRI	12	14%		6	7%
MSRC-CA	17	20%		9	10%
MSRC-NW	5	5%		2	3%
ACS	18	21%		9	11%
MSRC-GULF	9	11%		14	17%
MSRC-ATL	14	17%		7	8%
MSRC-HI	15	17%		7	9%
ACN	28	33%		14	17%
OSRL-USA				9	10%
NRC-NW				3	4%
NRC-CA				5	6%
NRC-HI				1	1%
Total Needed	84 units			84 units	
Total Acquired	89 units	105%		84 units	100%

Accessible through contracted organizations
Accessible through listed organizations
Accessible through governmental or commercial organizations

Availability of Out-of-Region Storage

This analysis considers the availability of primary storage devices to support NSTF on-water recovery activities. It does not consider secondary storage, which is a critical component to on-water recovery operations; once primary storage devices are filled, they must be offloaded to secondary storage so that on-water recovery may continue unhindered. While this is an important component of NSTF operations, it is out of scope for this study.

To estimate the availability of primary storage devices to hold recovered oil and water for out-of-region NSTFs, marine-compatible[25] storage PS-2, PS-3, and PS-4 units were counted. These storage units range in storage volume categorically, from less than 200 barrels at the smallest (PS-2) to less than 2,000 barrels at the largest (PS-4). To outfit 14 task forces with 12 storage devices each, a total of 168 storage devices are required, with a minimum storage volume of 16,800 barrels.

Table 3-4 shows the availability of out-of-region storage devices. Assuming that response organizations are permitted to release 50% of their inventory, there are sufficient storage devices available through direct contract, MOU, commercial ventures, and government sources. Tallying 50% of the marine-compatible storage devices from CISPRI, MSRC (Atlantic, California, Gulf, Hawaii, and Northwest), ACS, ACN, SEAPRO, NRC (California, Hawaii, Northwest), WCMRC, and OSRL stockpiles adds up to 178 total storage devices. This is 106% of the 168 devices required for 14 NSTFs and 204% of the required storage volume.

If the assumption is reduced to 25% of total inventory, marine-compatible PS-2, PS-3, and PS-4 storage units available through all sources listed above plus NAVSUPSALV and Navy Washington stockpiles tally up to 94 units, which is 56% of the devices required for 14 NSTFs. The total volume of storage is 20,060 barrels, which is 119% of the required total storage volume.

In addition to the contractual arrangements discussed in the boom and skimmer analysis, out-of-region equipment from OSRL, SEAPRO, NRC Hawaii, NAVSUPSALV, and Navy Washington are required for storage devices. Navy equipment is included in Table 3-4; Polar Tankers and Alaska Tanker Company both mention this equipment, however, access would require support from the Federal On-scene Coordinator.

[25] The WRRL does not distinguish storage device type/kind based on their compatibility for marine response. For this analysis, an extra step was taken to distinguish fast tanks and other open-topped storage devices that would not be appropriate for use as primary storage onboard vessels or barges in a NSTF. Only towable devices or devices completely contained were considered.

Table 3-4. Availability of Storage (PS-2, PS-3, and PS-4) to outfit 14 Nearshore Task Forces

Source	Units *(Max Withdrawal 50%)*	% of total	Barrels (bbl)		Units *(Max Withdrawal 25%)*	% of total	Barrels (bbl)
CISPRI	14	8%	2,851		7	4%	1,426
MSRC-CA	12	7%	4,752		6	3%	2,376
MSRC-NW	8	4%	3,551		4	2%	1,776
ACS	11	7%	5,500		6	3%	2,750
MSRC-GULF	10	6%	1,991		5	3%	996
MSRC-ATL	16	10%	1,111		8	5%	555
MSRC-HI	9	5%	2,043		5	3%	1,021
ACN	13	8%	3,612		7	4%	1,806
SEAPRO	2	1%	115		1	1%	57
NRC-CA	15	9%	1,458		7	4%	729
NRC-HI	1	1%	100		1	1%	50
NRC-NW	20	12%	1,605		10	6%	803
WCMRC	15	9%	425		7	4%	212
OSRL-USA	13	8%	314		7	4%	157
OSRL-UK	8	4%	2,408		4	2%	1,204
OSRL-Singapore	14	8%	2,401		7	4%	1,201
OSRL-Baharan					1	1%	314
Navy-SUPSALV					1	1%	619
Navy-WA					4	2%	2,019
Total Needed	168 units		16,800 bbl		168 units		16,800 bbl
Total Acquired	178 units	106%	34,216 bbl		94 units	56%	20,060 bbl

Accessible through contracted organizations
Accessible through listed organizations
Accessible through governmental or commercial organizations

Secondary Storage

Each skimming system recovers oil and water into a primary storage device. Once that storage device is full it must be transported to a secondary storage barge, offloaded, and then returned to service at the skimming system. There are six skimming systems and 12 primary storage devices in each NSTF, which allows for the skimmers to be utilizing one storage device while another is being transported and offloaded. The secondary barges

include offloading pumps and associated equipment to offload the primary storage devices. Secondary storage barges may be barges of opportunity but they must be outfitted with offload stations. The requirements for a secondary storage barge offload station are set out in Table 12.3.9 of the SERVS Technical Manual as shown below. Up to six offload stations are need on each secondary storage barge.

Table 12.3-9. Equipment Options for One-Off Loading Station for Out of Region Nearshore Storage Barge

	Alaska and West Coast Location	Other U.S. Locations	International Locations
Lightering/Offloading Equipment Option 1	DOP 250 pump 6" x 50' transfer hose 1" x 50' hydraulic hose 3/8" x 50' hydraulic hose Power pack	DOP 250 pump 6" x 50' transfer hose 1" x 50' hydraulic hose 3/8" x 50' hydraulic hose Power pack	DOP 250 pump 6" x 50' transfer hose 1" x 50' hydraulic hose 3/8" x 50' hydraulic hose Power pack
Lightering/Offloading Equipment Option 2	CCN 150 pump with transfer hoses and power pack	Other brand pump systems that come as set with hoses and powerpacks.	Other brand pump systems that come as set with hoses and powerpacks.
Associated Equipment (May not be needed depending upon barge equipment)	Nylon line Hose sling Tripod Winch	Nylon line Hose sling Tripod Winch	Nylon line Hose sling Tripod Winch

Scenario 546 in the PWS Tanker Plan calls for five out-of-region secondary storage barges to support NSTFs with the first arriving by hour 72. If each barge requires the maximum of six offload systems, 30 would be required. Once the barge arrives it must be outfitted with the offload pumps and associated gear before it can be placed in service.

The DOP 250 pump is classified as a Pump-P-4 in the WRRL Type Kind List. This is a common pump which is easily transported by vehicle or air. ACS, CISPRI, and MSRC have more than 100 of these pumps, so acquiring them is not an issue.

However, offload stations must be compatible with the primary storage devices. For instance, many of the mini-barges used by the in-region NSTFs have an offload pump already internalized within the barge, or could open a hatch to allow a submersible pump to be lowered into the compartment. However, many out-of-region primary storage devices are bladder tanks which do not have a means for inserting a submersible pump. We were not able to determine the compatibility of offload systems with primary storage devices.

Availability of Large Open-Water Assets

Large Open-Water Assets such as oil spill response vessels (OSRV), offshore supply vessels, tugs, and barges are more difficult to mobilize from out of the PWS region. There are OSRVs in Cook Inlet operated by CISPRI, Kodiak operated by ACN, and Unalaska operated by Resolve Marine. There are OSRVs on the west coast of the U.S. operated by MSRC, WMRC, and NRC. These vessels have dedicated/trained crews and could be mobilized to PWS in the timeframe of a week or less. Other large open-water assets could be assembled

by chartering vessels and mobilizing spill response equipment to outfit the vessel. OSRL has fly-away equipment sets for this purpose.

4 Discussion

4.1 Equipment Availability

Section 3.2 shows that out-of-region equipment stockpiles have adequate quantities of boom to outfit 14 NSTFs with equipment if they release 50% of their total inventories. However, if the assumption is reduced to 25%, then additional boom is required from ACN and access to ACN equipment is not guaranteed through a formal agreement. To outfit 14 task forces with adequate skimming systems, PWS Tanker Plan holders rely on access to ACN equipment, even if it is assumed that out-of-region OSROs will release 50% of their inventory. If only 25% of the inventory is released, plan holders will need skimmers from several additional OSROs with whom they do have not demonstrated contractual arrangements that meet State standards.

The number of primary storage devices is the limiting factor for outfitting out-of-region NSTFs. Based on the equipment inventories in the WRRL, PWS Tanker Plan holders may not be able access enough primary storage to support 14 NSTFs.

This equipment analysis focused only on boom, skimmers, and primary storage. However, 14 NSTFs would also require vessel support and a complement of ancillary equipment like anchors, lines, floats, hoses, and connections. Power packs must be compatible to the skimmers' operating specifications (hydraulic connections, running pressures) and operators must have expertise to assemble these components to make a functioning response system.

Adequate secondary storage must be available to offload the primary storage devices once they are full of recovered liquids, offload systems at the secondary storage barges must be compatible with primary storage devices, and a logistics plan must be in place so that this can be done without interrupting on-water recovery. The NSTF tactic in the SERVS Technical Manual specifies 27 fishing or support vessels per task force, which would create the need for 378 additional vessels to support the out-of-region task forces. It is possible but not guaranteed that the boom, skimmers, and storage devices would include all the ancillary equipment required for their deployment.

The availability of trained responders may also constrain NSTF deployment. The SERVS Technical Manual does not specify the full complement of responders needed per task force, as the number varies depending upon the assigned tactic, but identifies 40 basic responders, 4 tankermen, 23 Group Supervisors, and 34 vessel operators (101 persons) as part of the minimum for a 24-hour operational period. These responders should be trained on the specific type of equipment that they will be required to operate.

4.2 Contractual Access and Equipment Release

Accessing out-of-region equipment involves a level of uncertainty regarding equipment release policies on behalf of various equipment owners. During a Spill of National Significance (SONS) like the BP Deepwater Horizon well blowout, an "all hands on deck" approach may facilitate equipment release. However, for a less catastrophic or unfolding incident, it is less clear how much equipment would be released from out-of-region to support a PWS response.

Direct contractual access is important not only to demonstrating compliance with regulatory standards, but also on a practical level. The window-of-opportunity for assembling and deploying on-water spill response forces diminishes over time as oil spreads and becomes more difficult to encounter and recover. A response optimization analysis conducted for PWS affirmed that time is of the essence in maximizing response efficiency (Nuka Research, 2017).

Beyond the in-region response equipment available through APSC/SERVS' direct inventory, the PWS Tanker Plan holders have contractual access to the equipment inventories of ACS and CISPRI. Their access to ACN and SEAPRO equipment is not guaranteed under the Alaska MOU. Release of this Alaska-based out-of-region equipment also requires ADEC approval and additional approvals may also be required by the board of directors or managers of each Alaska PRAC.

Access to equipment in the Lower 48 and Hawaii relies on two major U.S. OSROs: MSRC and NRC. All five PWS Tanker Plan holders indicate that they have agreements with MSRC. APSC/SERVS mentions an agreement with NRC, though the terms of that arrangement are not provided. This analysis presumes that these agreements are sufficient for PWS Tanker Plan holders to access MSRC and NRC equipment from outside of Alaska and assumes that the relevant state and federal authorities will authorize the release of between 25-50% of their total inventories for a PWS response.[26] The analysis also assume that the percentage of total equipment will apply equally across all equipment types, which may not be the case.

Beyond the Alaska PRACs, MSRC, and NRC, a major international response equipment cache is maintained by OSRL in locations across the globe. APSC/SERVS is not an OSRL member, but Polar Tankers holds a statement of contractual agreement with OSRL and Andeavor, and Alaska Tanker Company mentions that an agreement is in place. OSRL requires an organization to become a member before accessing their equipment stockpiles, but membership can be obtained after a spill event.

[26] For example, in Washington, WAC 173-182-820 requires a registered OSRO to notify the Department of Ecology if it transfers equipment out of state and then Ecology evaluates whether the OSRO can still meet its registration standards without this equipment.

4.3 Logistical and Practical Considerations

Access to enough equipment is the first step in building 14 out-of-region NSTFs. However, beyond the inventory of boom, skimmers, and temporary storage, there are several important considerations related to building a functional task force.

The Spill Tactics for Alaska Responders (STAR) Manual depicts a typical Nearshore Free-Oil Recovery Strike Team (see Figure 4-1) to show how vessels, boom, skimming systems, and storage containers must be configured such that they can perform their assigned functions (Nuka Research, 2014). The illustration is only one of several possible configurations for a NSTF, which will dictate the equipment specifications and influence ancillary equipment, vessels, and personnel.

Building a set of equipment into a task force is more than a simple tallying exercise. All components must be inter-operable and must be able to function together to implement their assigned tactics. The SERVS Technical Manual describes the process of mobilizing out-of-region contractors and equipment to support a response. The process is described at a high level in Sections 12.3.4 and 12.3.5 as beginning with the establishment of contractual access and then involving a collaborative effort between Operations, Logistics, and Planning Sections to order the required personnel and equipment. However, it is a great deal more complicated than simply ordering equipment.

The reality of outfitting 14 NSTFs with 105,000 feet of boom, 84 skimmers, 168 storage units, over 375 vessels, and over 1,000 trained responders from more than a dozen different sources across Alaska, the U.S, and foreign countries is daunting. Resources will be mobilized and delivered on different time schedules depending upon their location and the permissions or approvals required to access them. Task force components must be assembled at a staging area and the deployment cannot take place until the full complement of equipment, vessels, personnel, and ancillary equipment are on-scene and fully functioning. The level of effort and amount of time and expertise required to accomplish this work is substantial and will be occurring simultaneously with the logistical demands of the rest of the response.

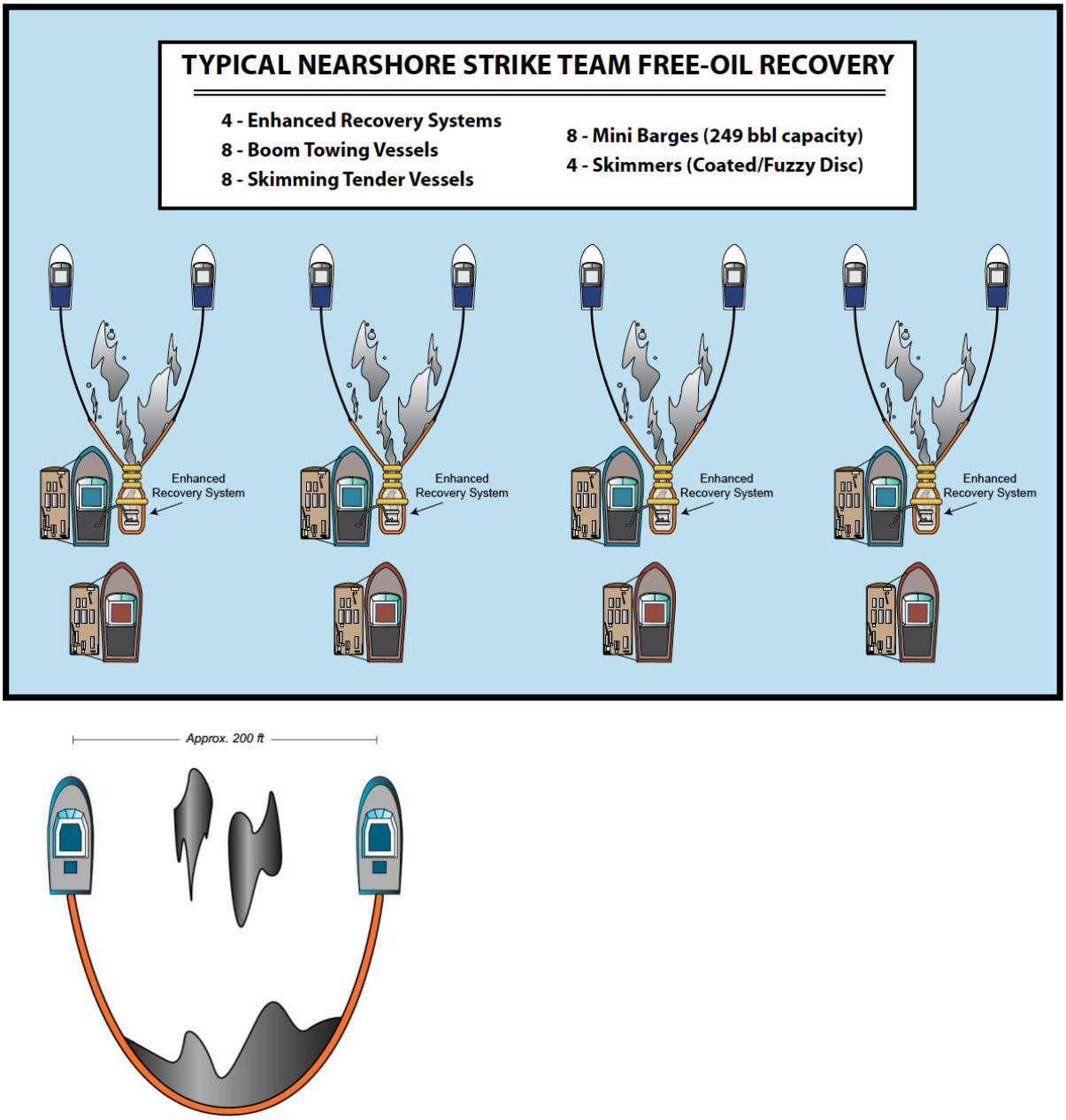

Figure 4-1. STAR Manual Nearshore Free-oil Recovery Strike Team Configuration

5 Conclusions

This study affirms previous work by the PWS Tanker Plan holders and PWSRCAC that found there is a considerable inventory of out-of-region spill response equipment available to support a PWS tanker spill through various contracting mechanisms.

Beyond directly contracted in-region response equipment, the degree of access to response resources in Alaska, the U.S., and internationally varies by plan holder, and is

subject to approvals or limitations to equipment release by regulators and, potentially, equipment owners. Based on this analysis and assumption that 25-50% of a response organization's inventory would be released for a given incident, this analysis found that PWS Tanker Plan holders have contractual access to an adequate inventory of boom to build 14 out-of-region task forces and to an adequate inventory of skimmers if 50% of inventories are released, but not if only 25% are. Primary storage will be the limiting factor, as the inventory of out-of-region equipment is not adequate to provide the number of units required to support the 14 task forces. Even with the higher assumption (50% of equipment being released for an incident), there are barely enough storage devices. If only 25% of inventory is released, the shortage is 74 storage devices.

In addition to the shortage of primary storage, the assemblage of 14 NSTFs with out-of-region equipment will require hundreds of vessels and thousands of responders. The process of building a functional task force requires that all equipment, personnel, vessels, and accessories are on-scene and functional before operations can commence.

Based on this analysis, the authors recommend several follow-up actions for PWSRCAC to consider:

- Conduct additional research to better understand the relationship between contractual arrangements and equipment access (e.g., constraints to equipment release, differentiating direct access from participation in networks).
- Inquire about the force of the APICOM and Alaska OSRO MOUs during future contingency plan reviews.
- Request that ADEC and PWS Shippers conduct a tabletop exercise to demonstrate the process and estimate the timelines involved in resourcing 14 out-of-region task forces. This exercise should require that specific equipment be identified, sourced, authorized for release, and transportation arranged for each task force. The exercise should also arrange for logistical support for the 14 NSTFs including fueling and resupply.
- Conduct additional analysis to examine the personnel, vessel, and logistics support required to assemble 14 out-of-region NSTFs to identify any potential gaps or shortfalls.

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