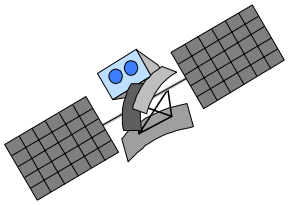
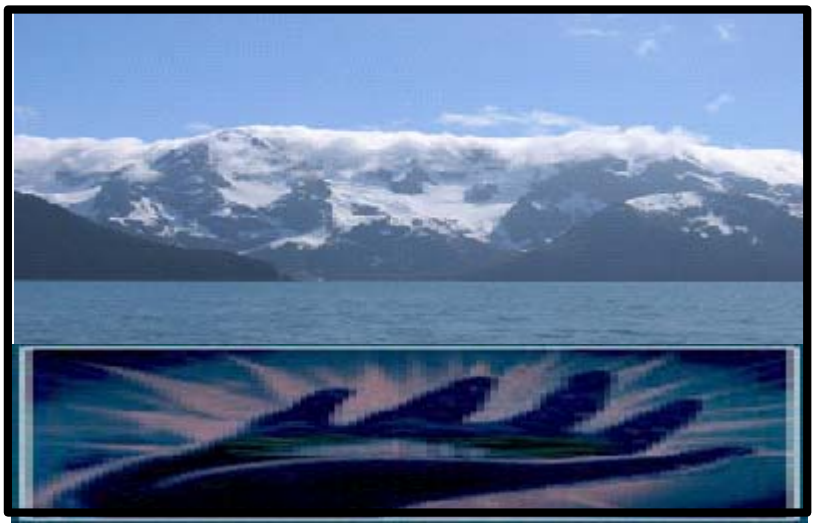
# TELECOMMUNICATIONS REVIEW

# WITHIN

# PRINCE WILLIAM SOUND

## April 2005





This report has been prepared by SHALL Engineering for the Prince William Sound Regional Citizens' Advisory Council in accordance with Contract Number 755.05.1.

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## PURPOSE

This review and report:

- Identifies the telecommunications facilities operating in the Prince William Sound Region.
- Documents the users of the telecommunications facilities operating in the Region so that the impact of those facilities on emergency response efforts can be assessed.
- Examines potential telecommunications system failure circumstances and the impact of those failures.
- Documents the tactical communications resources available for deployment to support a regional spill response.
- Examines the evolution of communications technology in the region.
- Identifies the existing planning documents governing the use of fixed communications assets and the tactical deployment of temporary communications assets to support regional spill response efforts.
- Identifies enhancements to the existing telecommunications response plans and facilities

The purpose of this review is to ensure that the existing telecommunications facilities in region are known so that they can be fully utilized during oil spill emergency response activities and to identify the limitations and vulnerabilities in the communications facilities. These limitations and vulnerabilities may render the communications facilities inadequate for the critical task of supporting incident response activities or they could result in significant system failures that would increase the scope and impact of the emergency circumstance.

## HISTORICAL CIRCUMSTANCES

During the Exxon Valdez oil spill of 1989, the magnitude of the spill response effort resulted in a substantial increase in the transient and temporary population of the region. The impact on the communications network of the increased population was further influenced by the great demand for information and disaster status reporting from the personnel operating within the impact region. The public communications facilities were not designed for the amount of traffic being experienced and blocked calls on the wireline and wireless communications facilities were experienced in some instances. This blocking of communications circuits during periods of large scale disaster response efforts is not unexpected since commercial and governmental communications facilities are designed to support normal traffic circumstances. There were no documented equipment failures in the regional communications system during the Exxon Valdez response activities that adversely impacted the ability of the network to support the response activities. During this period the facilities serving the area were supplemented by capacity expansions and by transportable communications equipment moved in to support the sudden and large scale spill response effort. The capacity additions

associated with these activities were prompt but they did require some implementation delays and periods of inadequate capacity.

## EMERGENCY CIRCUMSTANCES

The emphasis of the Prince William Sound Regional Citizens' Advisory Council (RCAC) is to prevent an oil spill in Prince William Sound and in the event of an oil spill, to minimize the impact and hasten the remediation. An oil spill event is most often characterized by stress to the communications facilities in the region but not by an overt failure of those facilities. The worst case circumstance may be an oil spill that is coincident with other disaster events including a failure of one or more communications systems. Such a worst case circumstance could possibly be associated with an earth quake and tsunami that results in simultaneous events including an oil spill and communications systems failures. This report therefore identifies the systems that would have the most impact if completely lost as well as those that are most likely to result in blocked circuits in the event of heavy traffic but no overt system failure.

## GENERAL INVENTORY OF COMMUNICATIONS TOOLS

The list of communications tools that are deployed in the marine and/or land based environment in the Prince William Sound region are listed below. Each tool is categorized below as either commercial, government or private based upon the ownership of the facility and whether the service is provided by a telecommunications carrier as a commercial service.

| | |
|---|---|
| Local phone service | commercial |
| Inter-exchange phone service | commercial |
| Cellular phone service | commercial |
| Internet access | commercial |
| Inmarsat mobile satellite | commercial |
| Globalstar mobile satellite | commercial |
| Iridium mobile satellite | commercial |
| VHF mobile and hand held radio | government/private |
| UHF hand held radio | government/private |
| HF radio | government/private |
| Alyeska Backbone Communications Network | private |
| State of Alaska Telecommunications System (SATS) | government |

Regional VHF systems are deployed by various governmental agencies and local VHF systems are deployed in each of the communities in the region by the municipal and borough governments to support mobile access by police, fire, and emergency response personnel operating within the communities. The local VHF systems are similarly deployed in each of the cities within the region and they provide access to a continuously staffed dispatch center operated by the municipalities.

VHF, HF, and some type of satellite radio are equipped on each marine vehicle and access is provided through these resources to the USCG marine safety office in Valdez (MSO Valdez) as well as to the commercial telephone network. How these resources are deployed by the most significant operators in the region and within the regional communities are discussed further in this report.

## A. REGIONAL VHF SYSTEMS

VHF systems are heavily utilized along the marine environment and the highway systems to provide communications to mobile staff operating in the region. The following systems are deployed and operating:

1. USCG marine radio system
2. State of Alaska legacy system
3. Emerging ALMR system
4. Alyeska Radio Telephone System (ARTS)
5. Forest service system
6. FAA system

### 1. USCG System

The USCG system includes a microwave radio system providing interconnection between MSO Valdez and VHF repeaters located at strategic locations throughout the Prince William Sound area. The locations of the repeaters and the frequencies utilized are presented as Table 1 on the following page. A general diagram of the system is attached as Figure 1. This diagram is not a complete representation of the USCG facilities in the region. The USCG system includes the facilities necessary to provide regional communications capability for ships operating in the area via VHF radio. Coverage via the USCG system is vital along all vessel traffic lanes from Valdez through Prince William Sound with extended coverage into the Gulf of Alaska. The VHF channels identified in Table 1 can be monitored and accessed by the USCG via a console at MSO Valdez. The marine channels can also be accessed and monitored at municipal emergency dispatch centers and at the municipal harbor master facilities throughout the region. Marine radios are resident on all commercial vessels and on most recreational boats and the USCG facilities are critical to providing excellent VHF coverage within the marine environment of the region. During incident response activities the marine channels can be

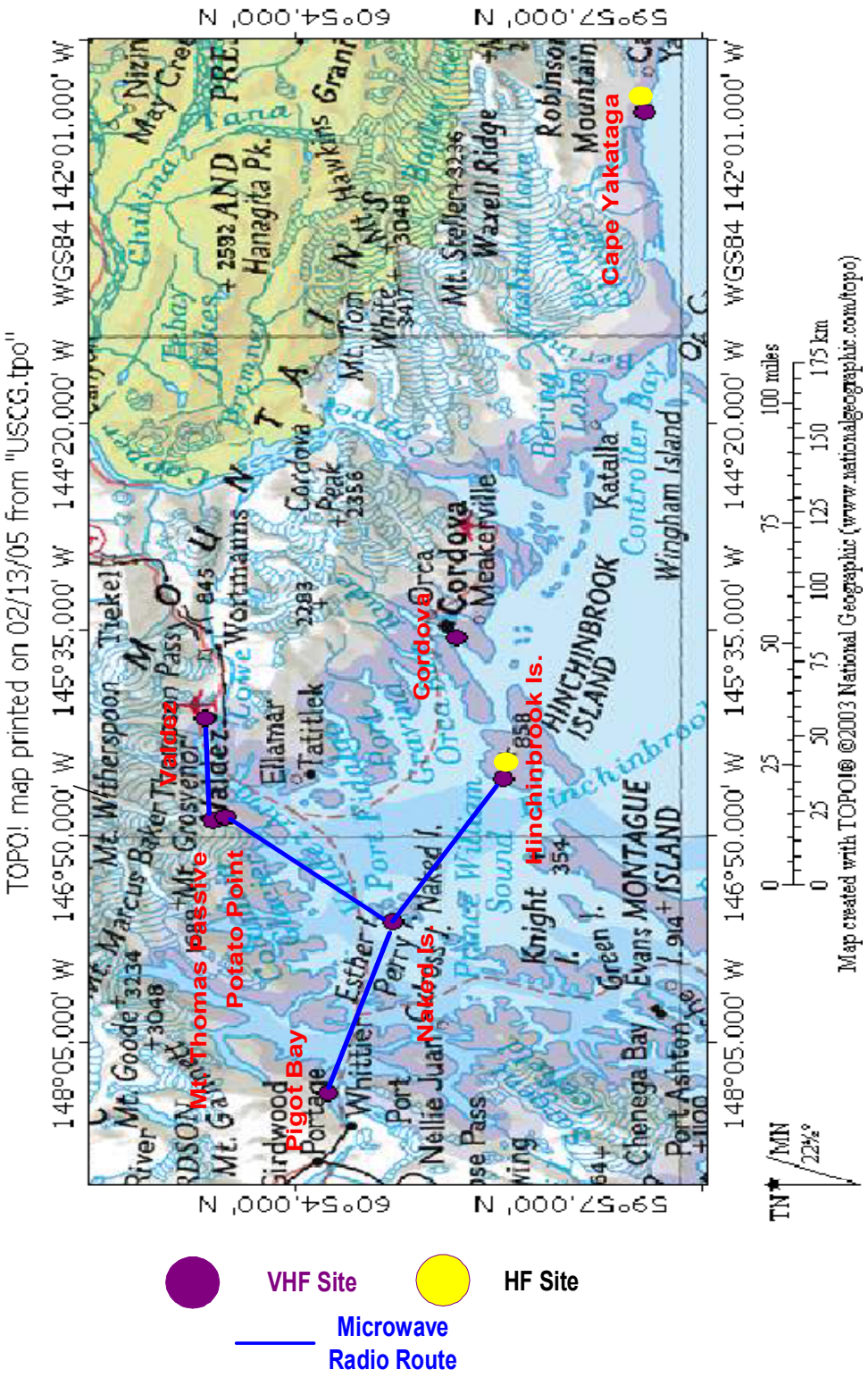
expected to be heavily utilized. The VHF repeaters and connecting microwave system are critical resources in providing marine communications in support of the water based operations. The USCG system has just recently been modernized with the replacement of the analog microwave radios with new digital radios along the route. Maintenance and support for the system is provided by a TKC Communications (TKCC) and New Horizons Telecom Inc. (NHTI) team.

**Table 1**
**USCG VHF Repeaters, Prince William Sound**

| Site | VHF Channel | Frequency MHz | Use |
|---|---|---|---|
| Valdez | CH 6 | 156.3 | Inter ship safety |
| | CH 13* | 156.6 | Ship to ship |
| | CH 16* | 156.8 | Calling/distress |
| | CH 21 | 157.05 | Coast Guard |
| | CH 22 | 157.1 | GC/civilian liaison |
| Potato Point | CH 6 | 156.3 | Inter ship safety |
| | CH 13* | 156.6 | Ship to ship |
| | CH 16* | 156.8 | Calling/distress |
| | CH 21 | 157.05 | Coast Guard |
| | CH 22 | 157.1 | GC/civilian liaison |
| | CH 83 | 157.175 | CG local |
| Naked Island | CH 6 | 156.3 | Inter ship safety |
| | CH 13* | 156.6 | Ship to ship |
| | CH 16* | 156.8 | Calling/distress |
| | CH 21 | 157.05 | Coast Guard |
| | CH 22 | 157.1 | GC/civilian liaison |
| | CH 83 | 157.175 | CG local |
| Cape Hinchinbrook | CH 6 | 156.3 | Inter ship safety |
| | CH 13* | 156.6 | Ship to ship |
| | CH 16* | 156.8 | Calling/distress |
| | CH 21 | 157.05 | Coast Guard |
| | CH 22 | 157.1 | GC/civilian liaison |
| | CH 83 | 157.175 | CG local |
| Cordova | CH 16* | 156.8 | Calling/distress |
| | CH 21 | 157.05 | Coast Guard |
| | CH 22 | 157.1 | GC/civilian liaison |
| Point Pigot | CH 6 | 156.3 | Inter ship safety |
| | CH 16* | 156.8 | Calling/distress |
| | CH 21 | 157.05 | Coast Guard |
| | CH 22 | 157.1 | GC/civilian liaison |
| | CH 83 | 157.175 | CG local |

* denotes a frequency which is monitored.

**Figure 1**
**USCG Prince William Sound Radio Facilities**



## 2. State of Alaska (SOA) Legacy System

The State of Alaska owns and operates an extensive VHF radio network which provides coverage along much of the land and marine highway system. These communication facilities are part of the State of Alaska Telecommunications System (SATS) which is constructed and operated for the state public service operating entities by the Enterprise Technologies Services (ETS) organization. These State owned facilities are utilized to support public safety, law enforcement, correctional industries, and natural resources management personnel in the State organizations. The SATS network is monitored and maintained by the SOA from the Anchorage facility on Tudor Road. Within the Prince William Sound area there are five VHF repeater locations as identified in Table 2 and shown in Figure 2. The repeater locations are Naked Island, Jack Mountain/Gore Peak, Heney Ridge, LaTouche Island, and Ellamar Mountain. Access to the SOA repeaters is provided from consoles at the Valdez Emergency Operations Center (VEOC) and from the Valdez offices of the Alaska Department of Environmental Conservation (ADEC).

In addition to the fixed repeaters, ADEC has portable VHF repeaters and repeater extenders available for tactical deployment as necessary to support the response activities associated with an oil spill event. The repeater extenders can be strategically placed about 10 to 15 miles apart to extend the coverage provided by the portable repeaters. The ADEC responders have portable VHF radios for system access and the ADEC maintains an inventory of portable radios that can be assigned as necessary.

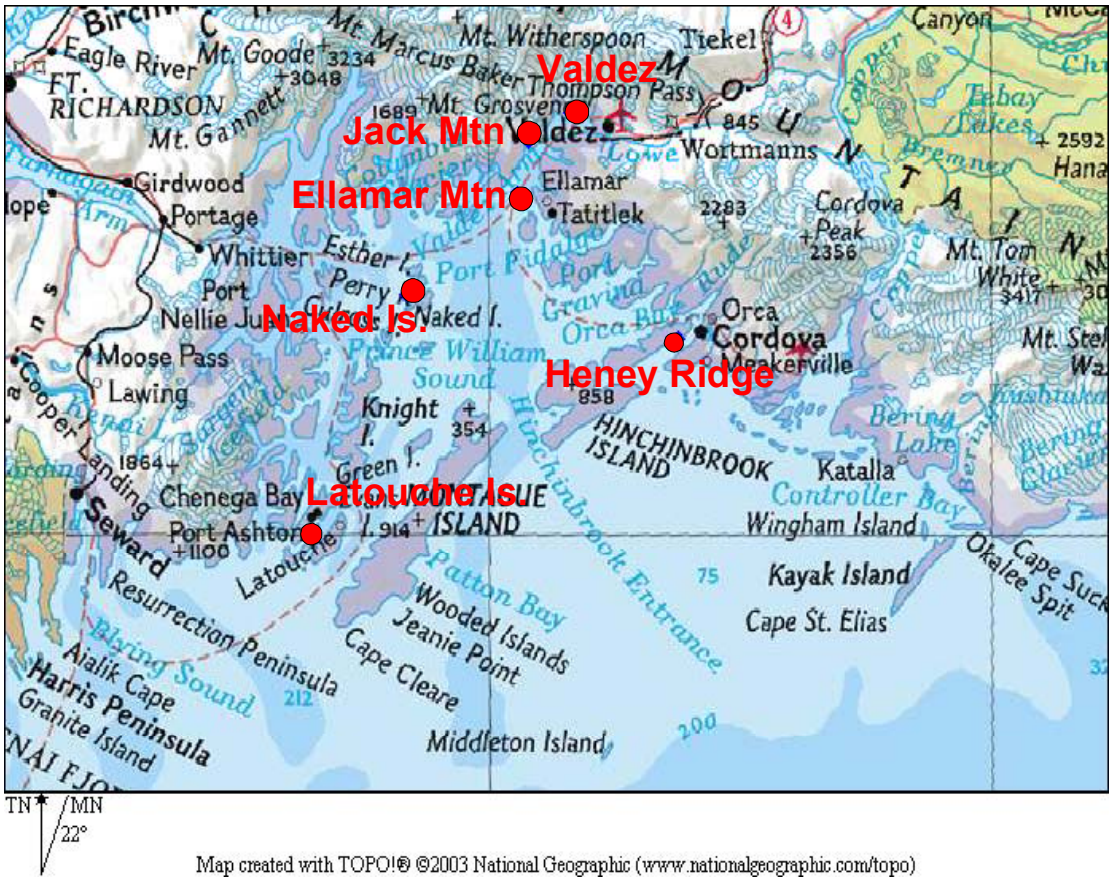
The VHF repeater system in the region is based upon old equipment which is no longer fully supported by the manufacturer. Funding is presently approved to replace the equipment at the existing VHF repeaters. The new equipment will be digital and compatible with the ALMR equipment. The ADEC is presently replacing the mobile radios with new radios which are dual mode and compatible with the existing and future repeaters.

Within the Prince William Sound Region the State ADEC is a major user of the VHF two way radio system. ADEC maintains consoles with access to the VHF radio system within Valdez at: the Court House, the Department of Transportation (DOT) warehouse, and at the VEOC. These consoles are staffed as necessary to support particular incident response events. ADEC also has console access from the Anchorage Cordova Street location and the Anchorage warehouse location. The SOA system is primarily utilized by SOA personnel operating within the region. However the resources are available for non-SOA emergency response personnel that have VHF radios capable of operation on the SOA VHF channels. The SOA system enhances the coverage and capacity provided by the USCG system.

**Table 2**
**State of Alaska Prince William Sound Area VHF Repeater Sites**

| Site Name | Latitude | Longitude | Transmit frequency | Receive frequency |
|---|---|---|---|---|
| **Naked Island** | 60-38-48 | 146-35-48 | 159.450 | 151.310 |
| **Jack Mountain/Gore Peak** | 61-03-18 | 146-35-48 | 154.755 | 159.255 |
| **Heney Ridge** | 60-31-30 | 145-41-36 | 154.830 | 159.315 |
| **LaTouche Island** | 60-00-09 | 147-54-05 | 154.815 | 159.285 |
| **Ellamar Mountain** | 60-55-07 | 146-40-05 | 159.390 | 151.370 |
| **Portable Repeaters** | | | | |
| **F1** | | | 154.775 | 159.255 |
| **F2** | | | 154.815 | 159.285 |
| **F3** | | | 154.830 | 159.315 |
| **F4** | | | 159.345 | 151.280 |

**Figure 2**
**State of Alaska VHF Repeaters in Prince William Sound**




Map created with TOPO!® ©2003 National Geographic (www.nationalgeographic.com/topo)

## 3. ALMR (Alaska Land Mobile Radio) System

The ALMR system is presently being constructed as a cooperative partnership between the federal, state and local governmental jurisdictions. The system establishes a secure, interoperable trunked VHF radio system providing two way radio communications for first responders and public safety officials. The system is installed and operating in the Valdez area and it will be expanded to provide service throughout the State. Dual mode hand held and mobile radios are being assigned to public safety personnel that will operate in the secure mode via the ALMR or via analog transmission using the legacy VHF repeater system which is shown as Figure 2. The ALMR will provide channels for use by local fire departments, police departments, and emergency medical personnel in the communities throughout the State. The ALMR channels are available for monitoring at the Valdez municipal dispatch center as they will eventually be at municipal dispatch centers in communities throughout the region and the entire State. The ALMR includes tactical channel reservations that can be assigned to support the response efforts associated with particular crises events. The ALMR provides the opportunity for interoperability between various government organizations that did not exist through the independent VHF mobile systems of the various enterprises. It is anticipated that the ALMR system will enhance the communications and coordination between the various organizations involved in emergency response activities. The ALMR trunked system also makes efficient use of the limited VHF frequency spectrum. The mobile hand sets include a crises button which when activated, will lock the mobile radio while alerting personnel at the public safety dispatch center. The identity and location of the mobile radio will be provided to the dispatch center personnel. Rescue personnel can then be promptly deployed to the location of the user in distress.

The ALMR provides an additional measure of reliability for mobile VHF systems operating within the municipal areas as well as the wider region. The ALMR will overlay and not replace the municipal systems utilized by police and fire departments in most cases, including Valdez.

## 4. Alyeska Radio Telephone System (ARTS)

The Alyeska Radio Telephone System (ARTS) is a mobile to mobile and mobile to fixed base station VHF/UHF radio system which provides communications for maintenance, operations, and security personnel operating along the length of the Pipeline. The system provides continuous connectivity to dispatch and support offices in Fairbanks and the Valdez Marine Terminal, to the Pump Stations, and to the Alyeska telephone network. The ARTS is a vital communications tool to help ensure the safety of personnel operating at remote locations along the Pipeline system. VHF repeaters are typically located at high sites along the Pipeline route. The high site locations are connected via the Alyeska Pipeline Backbone Communications System (BCS). The BCS is a

microwave radio system operated along the Pipeline route for Alyeska by AT&T Alascom. Communications between users in the same area are typically provided through the local VHF repeater.

Included in the Alyeska emergency response facilities are portable VHF repeaters that can be deployed to support mobile communications in the region surrounding an emergency response event. There are 12-3 watt suitcase VHF repeaters along the Pipeline with two staged in Valdez. There are also 3-35 watt VHF repeaters staged in Fairbanks and P.S. No. 5.

In the Valdez area Alyeska operates radio consoles at the Valdez Marine Terminal (VMT) Emergency Operations Center (EOC), at the SERVS VEOC, and at VMT Security. The radio consoles have access to the VHF channels as well as UHF and HF radios. The console operators can also monitor the marine and FAA air to ground frequencies. During emergency circumstances the Alyeska VEOC console maintains contact with the FAA FSS (Flight Service Station) to coordinate on matters associated with the air traffic activity. Details regarding Alyeska frequency assignments and management are presented in Part1, Section 3 of the Alyeska Oil Spill Contingency Plan Document CP-35-2. The channel assignments and utilization of VHF radio in the region are further detailed in Table 3-2 of Part 1, Section 3 and in Table 3-1 of Part 3, Section 3 of the Alyeska Valdez Marine Terminal Oil Spill Prevention & Contingency Plan, document CP-35-2.

## 5. Forest Service System

The U.S. Forest Service Operates a VHF mobile radio system in the greater Prince William Sound region. Mobile radios are dispatched with Forest Service personnel temporarily deployed remotely within the region. The system includes VHF repeaters at Ester Island, Montague Island, Hinchinbrook Island, Heney Ridge, and Kayak Island. The general location of the Forest Service repeaters are shown on Figure 3. The VHF repeaters are connected to a dispatch center located at Kenai Lake (288-3679) via UHF repeaters. UHF repeaters are located on Madson Mt., Hope Mt., and Heney Ridge. A backup dispatch center can be activated in Cordova (424-7661). The Forest Service VHF network is accessed and activated with tone control. The Forest Service system includes several portable VHF repeaters that can be deployed to support special activities in areas that do not have coverage from one of the permanent repeaters. The portable units are deployed from the Anchorage radio shop (743-9430).

**Figure 3**
**US Forest Service VHF Repeaters**

## 6. FAA Facilities

The FAA communications facilities serving the region consist of air to ground VHF radios which are exclusively dedicated to the flight support mission for which they are intended. The radios are highly redundant and highly reliable as required to ensure the safety of the airborne public. The radios consist of RCAGs (remote communications, air to ground radios) to support communications between pilots and FAA ground based flight service station personnel, RCO's (remote communications outlets) for flight briefings and the filing of flight plans, and CTAFs (common traffic advisory frequency) for the distribution of flight weather information. FAA VHF communications facilities are located within the region at Valdez, Thompson Pass, Whittier, Johnstone Point on Hinchinbrook Island, Middleton Island, Cordova, and Mt. Eyak. These radio locations are shown on Figure 4. The connections between the FAA VHF radios and the flight service stations rely on commercial and government owned facilities to the areas where the radios reside.

It was reported that the FAA communications radios were adequate to support the high level of traffic experienced following the Exxon Valdez oil spill. The FAA is experienced in keeping communications on the VHF channels brief and related strictly to matters of flight control and safety. Further details regarding the FAA facilities and operating frequencies assigned in the area are contained in the Alaska Supplement to the Flight Information Manual and in the frequency assignment tables of the Alyeska Oil Spill Contingency Plan documents. More detailed references to the Alyeska Plan documents are presented later in this document.

## 7. Other VHF Systems

Utilities and other enterprises operating outside plant facilities that are widely distributed within the region rely on VHF radio systems to communicate with the mobile maintenance and operations personnel. Copper Valley Telephone Cooperative (CVTC) maintains a VHF radio system for internal operations use. All CVTC service vehicles are equipped with mobile VHF radios and employees can use portable hand held radios to access the system. Other telephone and electric utilities operating within the municipal areas in the region also utilize VHF systems to maintain contact with the mobile operations and maintenance staff.

**Figure 4**
**FAA VHF Communications Locations**

Map created with TOPO!® ©2003 National Geographic (www.nationalgeographic.com/topo)

## B. LOCAL PUBLIC SAFETY VHF SYSTEMS

Each of the municipal governments within the Prince William Sound and surrounding impact region of this study have similar VHF two way radio systems deployed for communicating with the municipal public safety personnel including police, fire fighters, and emergency medical personnel. A console is located at the municipal dispatch center which is staffed 24 hours per day, 7 days per week. The dispatch center also acts as the public safety access point (PSAP) for the receipt and handling of 911 calls within the emergency response boundaries of the municipality. The dispatch center typically has access to the regional systems including ALMR and, in some cases, monitor the marine radio activity. This general model applies with slight variations in Valdez, Cordova, Homer, Kodiak, Kenai, Soldotna, and Seward. Emergency 911 calls from the four Kenai Peninsula PSAPs are routed through the dispatch center in Soldotna and forwarded to the PSAP location in the community of origination. The City of Whittier operates a VHF repeater for emergency response communications within the City. The dispatch center is not continuously staffed and 911 calls forward to a VHF radio to alert the on-duty response personnel via a portable radio.

The dispatch centers handle calls from mobile police, fire, and emergency medical personnel and they typically have access to the communications channels of other emergency response organizations operating in the area. Marine radio channels are monitored by the community harbor master but access is also provided at the municipal dispatch center is some cases.

## C. UHF RADIO

UHF base stations are utilized by Alyeska to support operations in and around the marine terminal and the Pump Stations to support activities in the immediate area. The UHF mobile units provide communications to the Alyeska console locations at the VMT and the VEOC. The UHF frequencies utilized around the VMT are identified in Table 3-1 of the Alyeska Valdez Marine Terminal Oil Spill Prevention & Contingency planning document CP-35-2, Part 1, Section 3. Hand held UHF radios are assigned by Alyeska for use in the VMT area.

UHF systems are deployed to provide communications within restricted local areas and the VHF systems are utilized to provide more widespread regional coverage.

## D. HF RADIO

The USCG operates HF radio sites in the region at Cape Hinchinbrook and Cape Yakataga. The HF radios are remoted to consoles at MSO Valdez to provide long distance communications to vessels that are outside the coverage area of the VHF repeaters. The HF frequencies utilized at the Cape

Hinchinbrook and Cape Yakataga sites are identified in the Table 3.

**Table 3**

| | | | | | |
|---|---|---|---|---|---|
| 1 | 2103.5 | 22 | 5680.0 | 43 | 15 MHz, WWV |
| 2 | 2141.031, 8240.0 | 23 | 5693.0 | 44 | 2182.0, Intl. hail |
| 3 | 2182.0, Intl. hail | 24 | 5696,9, air | 45 | 2182.0, Intl. hail |
| 4 | 2512.0 | 25 | 5215.0 | 46 | 2182.0 |
| 5 | 2638.0 | 26 | 6594.4 | 47 | 4125.0 |
| 6 | 2660.0 | 27 | 6200.0 | 48 | 4125.0 |
| 7 | 2667.0 | 28 | 6200.0 | 49 | 4575.0 |
| 8 | 2670.0 | 29 | 8650.0 | 50 | 4575.0 |
| 9 | 2678.0 | 30 | 8764.0 | 51 | 2670.0 |
| 10 | 2748.0 | 31 | 8240.0 | 52 | 5693.0 |
| 11 | 2830.0 | 32 | 8240.0 | 53 | 8980.0 |
| 12 | 3023.0 | 33 | 8983.0 air | 54 | 2182.0, Intl. hail |
| 13 | 3119.0 | 34 | 10166.5 | 55 | 2182.0, Intl. hail |
| 14 | 3122.0 | 35 | 11199.0 | 56 | 2182.0, Intl. hail |
| 15 | 4046.0 | 36 | 12284.0 | 57 | 2182.0, Intl. hail |
| 16 | 4125.0 | 37 | 12284.0 | 58 | 2182.0, Intl. hail |
| 17 | 4134.0 | 38 | 15085.0 | 59 | 6513.0 |
| 18 | 4134.0 | 39 | 2182.0, Intl. hail | 60 | 6212.0 |
| 19 | 4575.0 | 40 | 2182.0, Intl. hail | 61 | 6215.0 |
| 20 | 5167.0 | 41 | 5 MHz, WWV | 62-99 | 2182.0 backup |
| 21 | 5680.0 | 42 | 10 MH WWV | | |

An HF radio is also located at the VEOC that is controlled from the console at that location and which is utilized for ship to shore communications to SERVS and other vessels operating in the region. All ocean going vessels are equipped with HF-SSB radio capable of supporting long distance communications. The HF radios are utilized for communications beyond the coastal areas which are covered by the VHF base stations. HF radio frequencies are monitored at harbor master facilities in the regional metropolitan areas.

## E. SATELLITE RADIOS

Satellite radios are used within the regional marine and land based environments for routine and emergency communications. There are three different satellite systems providing global service as discussed in the paragraphs that follow. The communications provided by these satellite systems are independent of any other communications infrastructure in the area. While limited in capacity, the satellite systems can be expected to remain operating regardless of natural disasters impacting the ground based facilities within the PWS region.

## 1. Inmarsat

Inmarsat satellite terminals have largely replaced commercial VHF marine radio for the access to the public telecommunications system that was once provided by Alascom marine operators at coastal locations around Alaska. The VHF marine radios remain commonly used tools for access to port authorities and emergency services along the coastal areas. Inmarsat offers a series of satellite terminals with different levels of sophistication and capability to fit the requirements of the vessel or land based user. The services provided via Inmarsat terminals include voice access to the public switched telephone network (PSTN) as well as support at various levels for data transmissions. The Inmarsat terminals operate via satellites in the geostationary orbit. A satellite in the geostationary orbit remains at a fixed location in space as viewed from the earth bound radio site. Hence the access to the network via Inmarsat is stable and not intermittent as may be the case for the satellite systems based upon constellations of low earth orbit (LEO) satellites which move quickly across the horizon.

In addition to the routine use of Inmarsat terminals on the vessels operating in the Prince William Sound Region, the following uses are particularly noted:

- Vessels approaching Valdez often call the Valdez Municipal Dispatch Center.
- The Alyeska SERVS vessels utilize Inmarsat A terminals. The Inmarsat A system provides two way direct dial phone connection, including high quality voice, fax, e-mail, and data communications to any point connected to the commercial telecommunications network.
- The Alyeska inventory of emergency response communications equipment includes 2 Thrane & Thrane transportable Inmarsat terminals which are utilized during emergency response activities to provide support for voice services as well as data access to the Alyeska network for email and other file transfers and server access. These terminals include bread box sized electronics packages and roof mounted antennas with hemispheric domes.
- The SOA ADEC inventory of emergency response communications assets includes 3 portable Inmarsat M terminals.

## 2. Iridium

Iridium is a network of low earth orbit (LEO) satellites that provide access to the public switched telephone network via portable hand held radio phones. Since the system is based upon LEO satellites that pass rapidly across the horizon, the coverage provided is not continuous from most coastal locations. Access is therefore limited in time and calls may often be terminated as the view to the satellites becomes obstructed. However the units provide emergency access to the public communications network which is independent of the regional communications infrastructure and they can be used from virtually any location with intermittent service that may be interrupted as the serving satellite disappears over the local horizon. The use of Iridium phones in the region includes:

- A phone assigned to the State Trooper at Valdez
- USCG phones dispatched from the MSO, 3 phones
- Multiple phones included in the Alyeska emergency response inventory
- Community of Tatitlek, 1 phone
- Kenai Peninsula Borough, 6 phones
- Kodiak Harbor Master, 1 phone
- SOA ADEC, 4 phones
- Prince William Sound RCAC, 3 phones

Iridium phones are readily available at outlets in various communities and can easily be obtained and assigned.

## 3. Globalstar

Globalstar is a network of low earth orbit satellites providing worldwide coverage to a series of mobile and hand held radio terminals. The Globalstar services are similar in form and function to those of Iridium. The Globalstar system is used with desk phones and external antennas and radios aboard the SERVS vessels to provide phone where the mobile hand held satellite phones do not operate due to attenuation of the radio signals by the metal hull of the vessel. The use of Globalstar phones in the region is summarized as:

- Desk phones installed on Alyeska SERVS vessels
- City of Seward, 1 phone
- SOA ADEC, 4 phones

## F. LOCAL PHONE SERVICE

The local phone service is essential for providing high capacity ubiquitous connection to the world wide communications network from the many governmental and commercial enterprise facilities that would be involved in responding to an oil spill or other emergency event. The local phone service also provides the access to the long distance or inter-exchange phone service providers which are discussed further in the next section of this document. In addition to being essential to supporting emergency response efforts, the local phone network is the essential component in providing the communications to the public. Since Valdez is the terminus of the Pipeline and the location of the Marine Terminal, the local phone service is particularly critical in this area. The local phone service providers in each of the major communities within Prince William Sound and the surrounding impact communities are:

| **Community** | **Serving Telephone company** |
|---|---|
| Valdez | Copper Valley Telephone Cooperative |
| Cordova | Cordova Telephone Cooperative |
| Kodiak | Alaska Communications Systems |
| Homer | Alaska Communications Systems |
| Seldovia | Alaska Communications Systems |
| Kenai | Alaska Communications Systems |
| Seward | Interior Telephone |
| Whittier | Yukon Telephone |
| Chenega Bay | United Utilities |
| Tatitlek | Copper Valley Telephone Cooperative |

Copper Valley Telephone Cooperative serves the Valdez community with a Nortel DMS-10 switch. The legacy DMS-10 is a carrier quality product that provides redundancy in the major components, which is highly reliable, and which was originally designed to serve exchange areas with up to 10,000 lines. Subsequent generic software and hardware upgrades have expanded the capability of the DMS-10 to support up to 20,000 lines. Most disaster scenarios do not coincide with a loss of the local telephone switch. Only the worst case scenario of a large quake event could trigger an event sequence involving a simultaneous spill and loss of the local phone switch. A more likely circumstance is a large scale disaster recovery effort staged from the Valdez community that results in a substantial increase in the phone traffic and a high incidence of blocked calls. The actual capacity of the switch to support lines and trunks depends upon the particular configuration of the switch. It is suspected that the Valdez DMS-10 could efficiently support increased call holding times on existing directly connected lines. The most likely blocked call situation in the local service area may be to locations served off of Nortel switch remotes and digital loop carriers. These blocked calls result from a

number of links connecting the remote locations to the host switch which is inadequate to support the extraordinarily high call volume. The actual incidence of blocked calls to subscribers served from remotes is speculative and a determination of the likelihood and actual areas impacted requires detailed information on the facilities deployed in the local service area and on detailed traffic models and analysis. The impact of blocked calls within the local service area would have the most significance at the critical response locations such as the VEOC. This facility has been activated for past events and no reports of blocked calls to the facility have been made known.

The most likely source of blocked calls during an emergency response effort would result from an inadequate number of trunks between the local telephone company switch and the Anchorage toll switches of the inter-exchange carriers. During the Exxon Valdez emergency response activity in Valdez, a high incidence of all trunks busy was initially experienced until toll trunks could be added. The ability to quickly add significant numbers of toll trunks does depend upon the equipped configuration of the CVTC local switch. The VEOC also depends upon the local cable facilities of CVTC for connection to the VMT and for the connection to the Alyeska private communications network. An Alyeska radio provides a redundant route to the VMT and the traffic is distributed between the CVTC cable and the Alyeska radio. However communications to the VEOC would be seriously impacted by a loss of the CVTC cable.

The critical services provided by CVTC include private line circuits within the Valdez service area in addition to the provision of the routine public switched telephone service. The critical private line services provided by CVTC include the cable connections between the VEOC and VMT and the fiber connection between the CVTC local exchange and the cable system of WCI, as discussed further in the next section of this document.

CVTC has categorized various emergency response circumstances within its LEC network as follows:

- Extraordinary new service request activity
- Loss of commercial power
- Electronic equipment failure
- Copper cable cut
- Fiber cable cut
- Loss of remote electronic equipment facility
- Loss of Central Office building
- Loss of interconnecting company services

With regard to each of these circumstances CVTC has response plans as described below.

**Extraordinary service request activity**
CVTC staffs a Commercial Customer Service Office in Valdez at 329 Fairbanks St. with regular office hours from 8 a.m. to 5 p.m., Monday through Friday, phone 835-2231. New service requests and requests for additional services are handled through this office for both the Valdez and Tatitlek service areas. If necessary the work force in this office would be augmented by other CVTC staff in Valdez and Glennallen. Temporary employees would be utilized if necessary.

**Loss of commercial power**
All CVTC telecommunications service sites are equipped with battery backup systems to maintain power to the sites for outages of several hours duration. For longer duration outages, all sites are provided with emergency AC power connectors and transfer switches. CVTC maintains mobile and smaller portable generators in Valdez that can be dispatched within the network as required and connected to the emergency AC power connectors at the sites. The main Valdez and Glennallen central offices are equipped with dedicated auto-start standby generators and automatic transfer panels to provide uninterrupted power during commercial power failures.

**Electronic equipment failure**
CVTC maintains an inventory of spare electronic circuit packs for the equipment utilized. Service support agreements are in place with the major equipment suppliers to provide emergency technical support 24 hours per day. CVTC maintenance technicians in Valdez can be supplemented with staff from Glennallen, if required.

**Copper cable cut**
CVTC technicians install and maintain the outside plant cable facilities of the utility. The outside plant construction equipment and repair materials including cable and splicing kits are available in the Valdez warehouse. Cable cuts are not uncommon in the local exchange telephone business and the technician staff is skilled in quickly responding and repairing cut cables.

**Fiber cable cut**
Fiber cables typically provide greater bandwidth and therefore have greater network service impact when severed than the copper cables. However the construction equipment and repair procedures are similar to those utilized for copper cables. CVTC operates a dedicated fiber splicing trailer that is supplied with splice kits and fiber cable to quickly repair damaged cables and restore service. The repair personnel and equipment will be promptly dispatched in response to a cable failure, 24 hours per day, seven days per week.

**Loss of remote electronic equipment facility**

In the event of a catastrophic loss of an remote electronic equipment site, CVTC has emergency power and electronics equipment available to deploy for the restoral of the critical and essential services until the facility can be completely replaced. This equipment can be installed in existing buildings or deployed in a utility vehicle for temporary service where no building remains to house the equipment.

**Loss of interconnecting company toll services**

The historical problem with the public telecommunications network following extraordinary events resulting in substantial and sudden increases in network traffic is an inadequate number to trunks between the local service switch and the switch of the inter-exchange service providers. In the event of a circumstance where the connections to the inter-exchange carriers fail or otherwise become insufficient to support the network traffic, CVTC would coordinate with the connecting company personnel to initiate appropriate upgrades or repairs.

**Loss of Valdez Central Office**

The complete loss of the Valdez C.O. is an unlikely event which would have catastrophic consequences for communications in the area. In this case, the public wireline telephone service would be eliminated. The response to this catastrophic event would be to work cooperatively with the major equipment suppliers to quickly rebuild the facility with temporary equipment and then more permanent installations. CVTC operates a fiber optic cable between Valdez and Glennallen which could be utilized to rehome selected and critical services to the Glennallen exchange.

CVTC has served the Valdez area with telecommunications service since 1961 and it consists of personnel who live and work within the community and have a deep sense of commitment to providing reliable and quality service to the public and business and governmental enterprises in the region. The 24 hour emergency service contact numbers for CVTC are:

| | |
|---|---|
| Valdez: | 835-5822 |
| Glennallen: | 822-7611 |

The following escalation list can be utilized, if necessary during emergencies:

| | Office | Cellular |
|---|---|---|
| Valdez Plant Foreman, Alan McHone | 835-2231 | |
| Valdez Superintendent, Jim Gifford | 835-7706 | 255-1221 |
| Chief Operating Officer (COO), Jeff Redding | 835-2231 | 255-1213 |
| Chief Executive Officer (CE), Tim Rennie | 835-2231 | 255-1211 |

GCI has filed to provide local telephone service within the Valdez local exchange service area. The local service plans of GCI may involve placing a switch in Valdez and placing the phone service on the cable TV network. The GCI service would provide an additional measure of facility diversity in the provision of local phone service in the area.

To provide access to the PSTN which is independent of the LEC switch and which will continue to operate in the event of a failure of the local switch, foreign exchange (FX) circuits can be ordered from the inter-exchange carriers. The FX circuits connect via the IXC facilities to a local switch in another community, such as Anchorage. Access to the PSTN via the FX circuits will continue to be provided during the rare circumstance of a local switch failure. FX circuits are utilized in the Valdez area by various organizations including the USCG.

Kodiak, Homer, and Kenai are provided with local phone service with Nortel DMS-10 switches by Alaska Communications Systems (ACS). Seldovia is served as a remote off of the Homer switch of ACS. Cordova is served with a DMS-10 by Cordova Telephone Cooperative (CTC). The local telephone company switches include a high degree of redundancy and reliability. The rare instances of failure are remedied by a quick response by the telephone company technical staff with support provided by the manufacturer technical assistance center (TAC). For all but the most unusual circumstances, it is likely that these switches would remain in service and adequate to support disaster recovery efforts. The comments made relative to the CVTC Valdez exchange also apply to these offices but the likelihood and magnitude of the spill event may be lower in these communities.

## G. INTER-EXCHANGE CARRIER (IXC) PHONE SERVICE

The inter-exchange carrier (IXC) phone service supports long distance calls between subscribers served off of the local exchange carrier (LEC) telephone switch and the telephone subscribers of telephone companies in other communities throughout the world. The reliability of the IXC service to Valdez is of critical public service importance during normal circumstances and especially during times of disaster response. Without the IXC connections, the only paths out of the community would be the emergency routes via HF radio and the Iridium and Globalstar satellites, limited SOA service via the SATS microwave and the service provided to Alyeska over the microwave that is operated by AT&T Alascom along the Pipeline route. The IXC facilities are not just utilized for the commercial toll telephone service from the CVTC local service switch but they also provide the IXC connections for the wireless service providers and the access to the Internet for the local Internet Service Providers (ISP). Other business and government enterprise private line circuits out of the community depend upon the IXC facilities for transport. The availability of two fiber cables between Valdez and Anchorage provides a

valuable degree of redundancy which makes the complete loss of IXC service an extremely unlikely event. The simultaneous loss of both IXC fibers coincident with a natural disaster and oil spill in the region would be of great impact. In this unlikely but catastrophic circumstance, recovery activities would include use of the AT&T satellite earth station and the re-routing of limited traffic north on the GCI terrestrial fiber and the AT&T radio system to Fairbanks.

The loss of either fiber would have a significant impact on the communications service into the Valdez area until service could be added to the remaining cable and repairs made to the failed cable.

## 1. AT&T Alascom IXC Facilities to Valdez

AT&T Alascom connects to the CVTC Valdez switch to provide access to the PSTN beyond the Valdez local exchange service area. The AT&T toll switch is located in Anchorage. The Valdez to Anchorage transport of AT&T is provided on a sub-marine fiber optic cable which is owned and operated by WCI cable. WCI operates primarily as a carrier's carrier by offering large amounts of capacity on its cable system to other service providers, such as AT&T Alascom, who then offer retail communications services to the public. The WCI facility is a 12 fiber cable which is unrepeatered/unpowered from Whittier into the south side of the Port of Valdez. The ocean cable lands to the east of the Aleyska Pipeline Terminal then heads east along Dayville Road to the Copper Valley Electric Association (CVEA) facility where the WCI Valdez POP (point of presence) is located. From this WCI POP, the traffic from the WCI cable is carried into Valdez as an OC-12 on fiber cable that is owned and operated by CVTC. The WCI equipped capacity at present is a SONET OC-48. WCI owns and operates an OC-48 add/drop mux (ADM) in the Valdez POP that is part of an OC-48 BLSR (bi-directional line switched ring) that stretches from Valdez to Fairbanks, including ADM capabilities at all intermediate sites. The submarine cable lands at Whittier and the transport to Anchorage is via land based fiber optic cable which is buried along the Alaska railroad (ARR) right of way (ROW) for the majority of the route. From Anchorage, the WCI cable is buried along the ARR ROW to Fairbanks. At Whittier the WCI cable connects to submarine fibers that land at and provide service to Juneau and to submarine fibers that land in the lower 48 states at Pacific City, Oregon.

In Anchorage the WCI cable connects to the AT&T toll switch on Government Hill. The toll switch is in a secure location with standby power. The SONET equipment provides a high degree of redundancy by using dual fiber pairs in a collapsed ring configuration. While the WCI facility has high capacity, AT&T has 4 DS3's of that capacity for service between Valdez and Anchorage. Only one of the DS3's is presently in

service so there is currently unused capacity available to serve Valdez. During the period of increased activity associated with the response to the Exxon Valdez oil spill, there was initially a high incidence of busy signals delivered from the Valdez switch for toll calling The inter-exchange blockage resulted from a number of toll trunks that was inadequate to support the increased level of long distance calling. During the Exxon Valdez event, the community of Valdez was served by satellite and the number of inter-exchange trunks supplied to the area was limited by the bandwidth of the satellite. Since 1989, two fiber optic cables have been constructed between Valdez-Whittier-Anchorage and the bandwidth that can be economically delivered to the area has substantially increased. The number of trunks that can be supplied to the local switch by the IXC is not as restricted as it was in the earlier times. However the number of trunks actually placed into service is not selected to support the extraordinary amount of traffic associated with a major disaster response effort. Bandwidth to the community of Valdez exists to expand the size of the IXC trunk groups, if necessary. Some brief period of inadequate trunking could be expected until the LEC and IXC could respond with the necessary trunk additions.

AT&T Alascom operates a satellite earth station in Valdez which could be utilized to transport limited toll traffic to Anchorage in the event of a failure of the fiber optic cable (FOC). While the earth station provides a valuable restoral facility, the amount of capacity provided via the satellite would be significantly reduced from that provided via the fiber. The satellite would provide a resource to support reduced inter-exchange service to the area during the period of the fiber optic cable repair. AT&T Alascom also operates a radio system along the Pipeline and Richardson Highway routes north to Fairbanks. Much of the capacity on this facility is dedicated to the internal network of Alyeska Pipeline Service Company. Plans are presently proceeding to digitize and modernize the radio system between Valdez and Fairbanks along the Pipeline route. This system provides a communications route into Valdez which is diverse from and independent of the FOC system. The loss of the AT&T IXC services to Valdez would have impact beyond the loss of the AT&T provided toll telephone service. Private line connections between Valdez and other communities are provided on the AT&T system for the USCG, FAA and others.

AT&T Alascom operates a continuously staffed Network Operation Center (NOC) in the Anchorage Toll Center. The NOC monitors the statewide network facilities of AT&T and provides prompt response to service impacting network events, 24 hours per day, 7 days per week. The NOC contact number is 800-252-7521, or (907)264-8363. The escalation list for problems in the AT&T network is:

**1st level**
Brian Sturdevant, ANCC Supervisor
907-264-8301
907-351-3326(cell)

**2nd level**
Kay Witt, Operations Manager
907-264-8461
907-229-0459(cell)

**3rd level**
Pat Hawkins, Group Manager
503-727-4611
888-858-7243 pin-142586(pager)

The AT&T NOC is in close contact with the operations centers of the statewide community of inter-connecting service providers and is fully prepared to mobilize and staff appropriately in response to any failure in the communications network serving Alaska. Included in the contact list of AT&T is the NOC for WCI Cable. The WCI NOC is located in Hillsboro, Oregon and is staffed 24 hours per day, 7 days per week. The WCI NOC contact number is (503)466-8513. Routine activities associated with the WCI cable are staffed from the Anchorage office at 8717 Dimond D Circle, phone 365-7214.

## 2. GCI IXC Facilities to Valdez

GCI provides inter-exchange service to the community of Valdez via a fiber optic cable which is owned and operated by GCI. The GCI IXC facilities serving the region are very similar to those of AT&T/WCI. The cable route includes a non-repeatered submarine segment between cable landing points in Valdez and Whittier. At Whittier the GCI cable connects to submarine fibers that land and provide service to Juneau and to submarine fibers that land in the lower 48 States at Norma Beach, Washington. The cable also connects to land based fiber to Anchorage. Between Whittier and Anchorage the GCI cable follows a land based route near that of the WCI cable as far as Portage where it diverges from the railroad based route of the WCI cable and follows a route along the DOT highway right of way (ROW) and power line right of way into Anchorage. At Valdez the submarine cable from Whittier connects to fibers buried along the Pipeline to Fairbanks. The system operates as an OC-48 bi-directional line switched (BLSR) with access nodes at Anchorage, Whittier, Valdez, and Fairbanks. The extension of the Anchorage to Valdez fiber to Fairbanks along the Pipeline corridor provides the ability to continue to route some traffic North from Valdez to Fairbanks in the event of a failure of the cable from Valdez to Anchorage

via Whittier. The configuration of the ADM (add/drop multiplexer) terminal at Valdez is not specifically known but it can be expected that substantial unused capacity exists on the GCI cable between Anchorage and Valdez. The GCI cable lands on the North side of Valdez Arm on the corner of the Alyeska SERVS facility and across the arm from the WCI cable.

In Anchorage, the cable connects to the GCI toll switch located at the South Anchorage Distribution Center (SADC). Performance of the cable is monitored by GCI at the GCI NOCC (network operation control center) located in the SADC facility. The GCI NOC can be contacted at (907)868-5561 or (800)770-8725. The escalation list is:

- Senior NOCC Technician on duty
- Supervisor on duty
- Manager on duty
- V.P., Long Distance Operations

This escalation can be initiated through the GCI NOCC.

GCI also operates a satellite earth station in Valdez which could be utilized to carry selected and limited traffic out of Valdez in the event of a failure of the FOC. Other relevant GCI contact numbers include:

- Whittier cable landing station: 868-0505
- Valdez cable landing station: 835-8632
- Valdez technician: 835-4930, cell 255-2201
- Valdez earth station: 787-6220

It is noted that the USCG has a T1 on the FTS (Federal Technology Service) facilities to the PBX at the Valdez MSO. The FTS is carried on the GCI cable to Valdez and will therefore experience a service interruption in the event of a GCI cable failure.

## 3. IXC Service to Other Regional Communities

The other communities in the region are provided with inter-community IXC telephone service by AT&T or by AT&T and GCI via either land based cable, terrestrial radio, or satellite as indicated in Table 4.

The locations that are served via satellite and both AT&T and GCI have a high level of reliability in the provision of IXC service but bandwidth additions to support sudden extraordinary requirements would be limited and slow. The satellite earth stations suffer occasional weather related outages resulting from the accumulation of snow in the antennas. However the satellite systems are not as vulnerable to damage due to earth bound disasters. A catastrophic failure of the satellite would have a profound impact on the IXC service to the communities served via satellite but this event would not be expected to coincide with an oil spill event. AT&T Alascom has access to a restoral satellite in the event of a failure of the primary satellite and both AT&T and GCI have general plans to guide the restoral of traffic in the event of a failure of the primary satellites. The primary satellites are AMC-8 (Aurora III) for AT&T Alascom and Galaxy 10R for GCI.

**Table 4**

| Community | Facilities Based IXC | Service Type |
|---|---|---|
| | | |
| Cordova | AT&T, GCI | Satellite |
| Homer | AT&T, GCI | Terrestrial radio connecting to cable at Soldotna |
| Kodiak | AT&T, GCI | Satellite |
| Seldovia | AT&T,GCI | Terrestrial radio connecting to cable at Soldotna |
| Seward | AT&T, GCI | Fiber optic cable |
| Whittier | AT&T, GCI | Fiber optic cable |
| Chenega Bay | AT&T | Satellite |
| Tatitlek | AT&T | Satellite |

## H. CELLULAR PHONE SERVICE

The primary facilities based cellular service providers in the region are as indicated in the table below.

| Community | Cellular Service Providers |
|---|---|
| | |
| Valdez | Copper Valley Wireless, Dobson |
| Cordova | Cordova Wireless, Copper Valley Wireless |
| Homer | ACS, Dobson |
| Kodiak | Kodiak Wireless |
| Seldovia | ACS, Dobson |
| Whittier | ACS, Dobson |

Other wireless carriers may serve the above communities through roaming agreements with the facilities based carriers.

The wireless service in the Prince William Sound region provides a valuable tool for mobile subscribers in the region to communicate via the world wide PSTN from mobile marine and land based locations within the region. The primary providers in the PWS area surrounding Valdez are Copper Valley Wireless (CVW) and Dobson (CellularOne). Copper Valley Wireless is the wireless service company of Copper Valley Telephone Cooperative. The CVW system utilizes a switch located in Valdez. Calls between handsets on the CVW system and between CVW subscribed handsets and local telephone subscribers within the Valdez service area of CVTC are not dependent upon the availability of any IXC facilities. Calls on the wireless network are dependent upon the same IXC facilities as the land based phone network for calling outside of the local wireless and wired telephone service areas. In addition to service within the community of Valdez, CVW provides unique and critical coverage to the extended PWS region via cellular sites located at Naked Island and at Heney Ridge, near Cordova. These sites provide cellular coverage to marine based customers.

The Dobson system includes a cell site located in the Valdez port grain silos but the Dobson switch is located in Anchorage. The Dobson cell site is connected to the Anchorage switch via T1 facilities leased from AT&T Alascom. Therefore a failure of the Alascom/WCI fiber facility will result in a loss of all of the Dobson provided cell service in the area.

Dobson has a cell on wheels (COW) which is a portable cell site that can be deployed as necessary during times of emergency. The COW is staged in Anchorage. Customer support for Dobson is provided from an out of state call center and is accessed from a subscribed cell phone via 611.

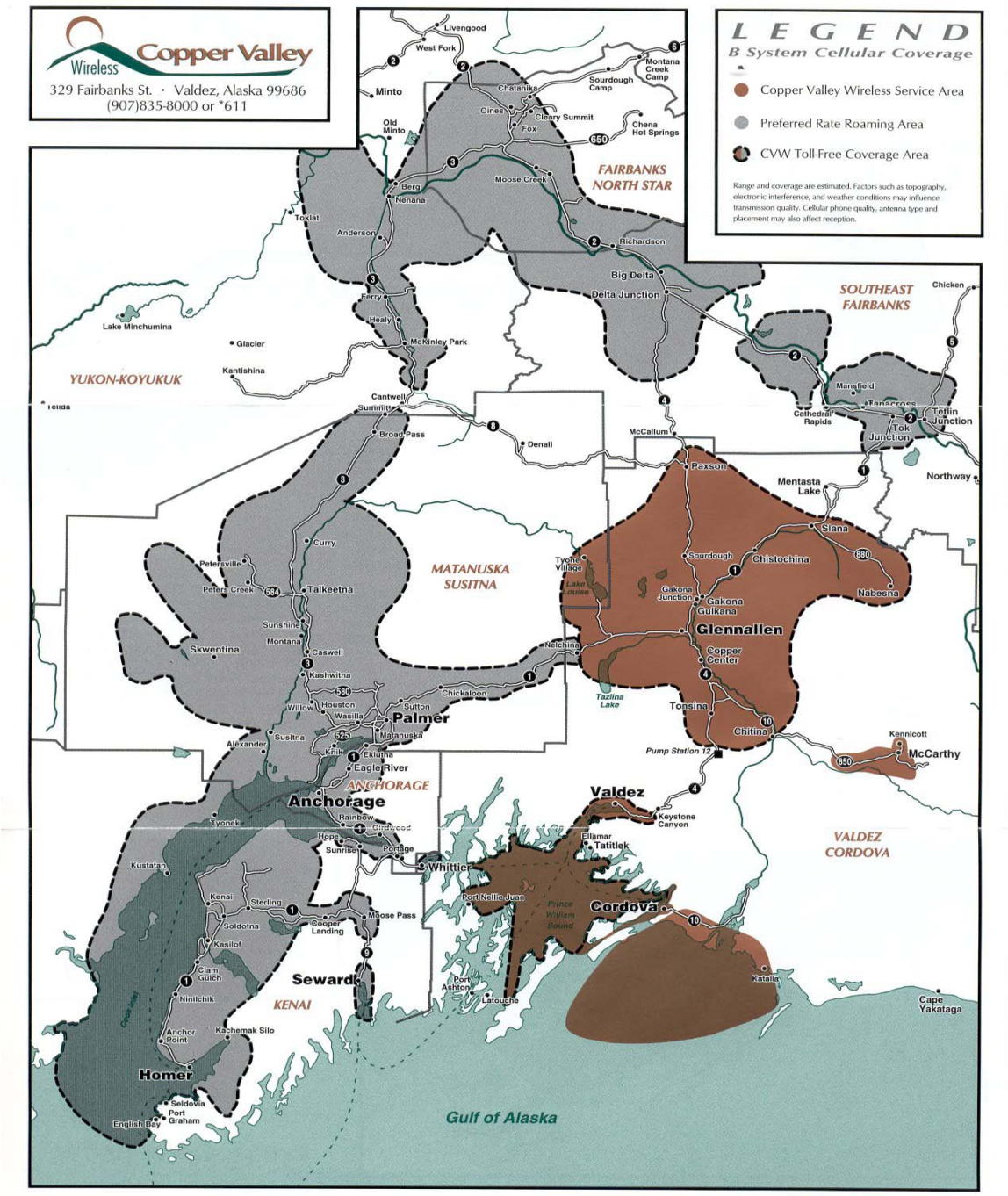
The service/coverage areas of the various wireless service providers are shown as Figures 1-4, attached. The wireless coverage of the various providers is not complete within the service areas and there are locations within the service areas where there is no coverage. The most complete coverage would be provided by having phones available which are subscribed to the multiple service providers in the region.

While cellular service provides a valuable tool for remaining connected from locations within the marine and land based coverage areas, during a period of disaster response it can be expected that the wireless service in the area would become heavily utilized and a high incidence of unavailability due to busy signals would result. In the event of high cell phone usage and network blockage during major spill response activities, response agencies may wish to work with the cellular provider to establish priority access to the cell site for the handsets of critical responders.

ACS Wireless plans to construct CDMA (code division multiple access) cell sites in the Valdez area in 2006. The ACS build out will provide an additional option for wireless service in the area. The additional wireless facilities will result in additional capacity, coverage, and features.

Other providers within the region are also constructing new cell sites which will improve the wireless service alternatives and coverage within the area. Cordova Wireless is in the process of providing new cell sites near Johnstone Point on Hinchinbrook Island and along the road outside of Cordova.

**Figure 1**
**Copper Valley Wireless Coverage**




Note:
Coverage is not complete within the service area described by the above map.

**Figure 2**
**CellularOne (Dobson) Cellular Coverage**

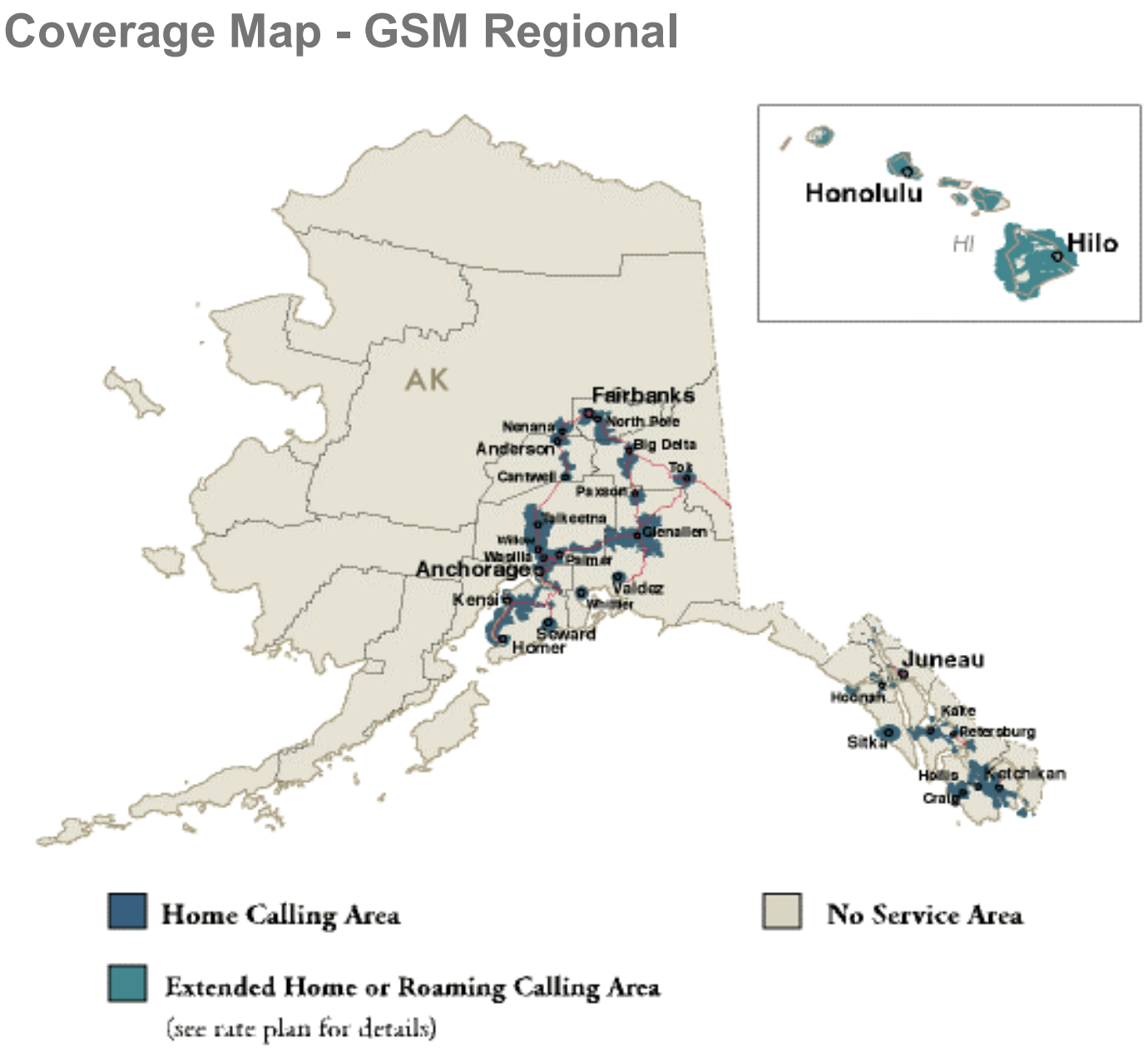
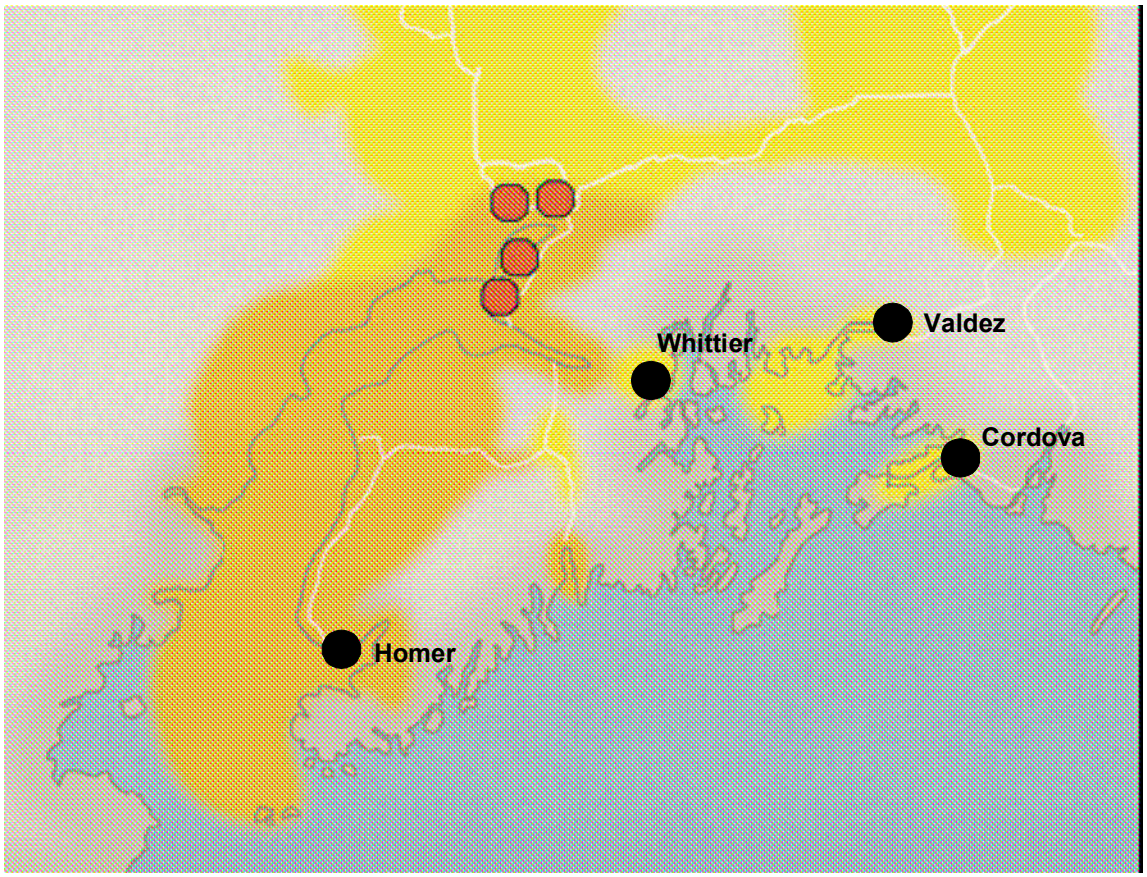


**Figure 3**

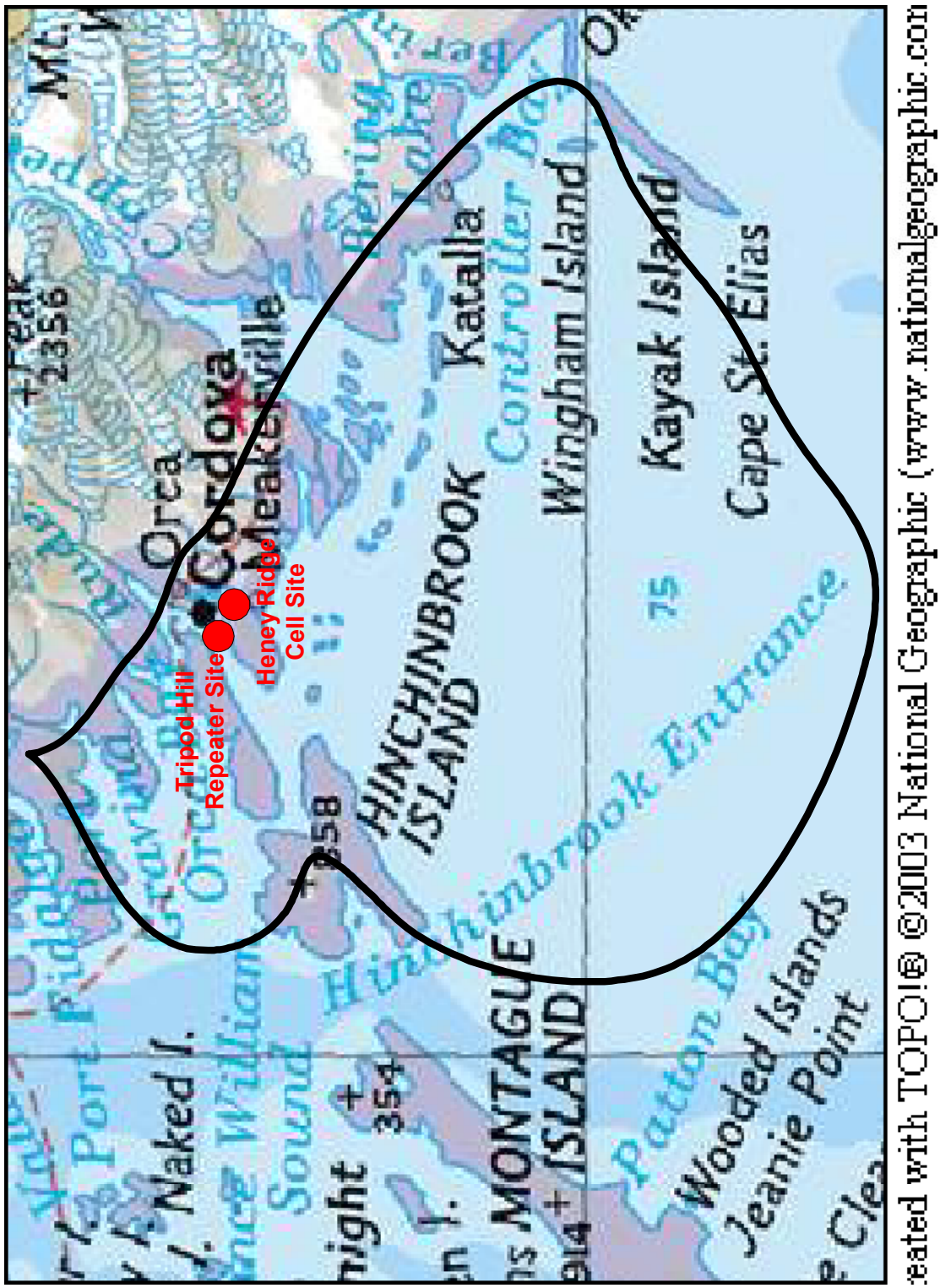
ACS Wireless Coverage Map




**Note:**

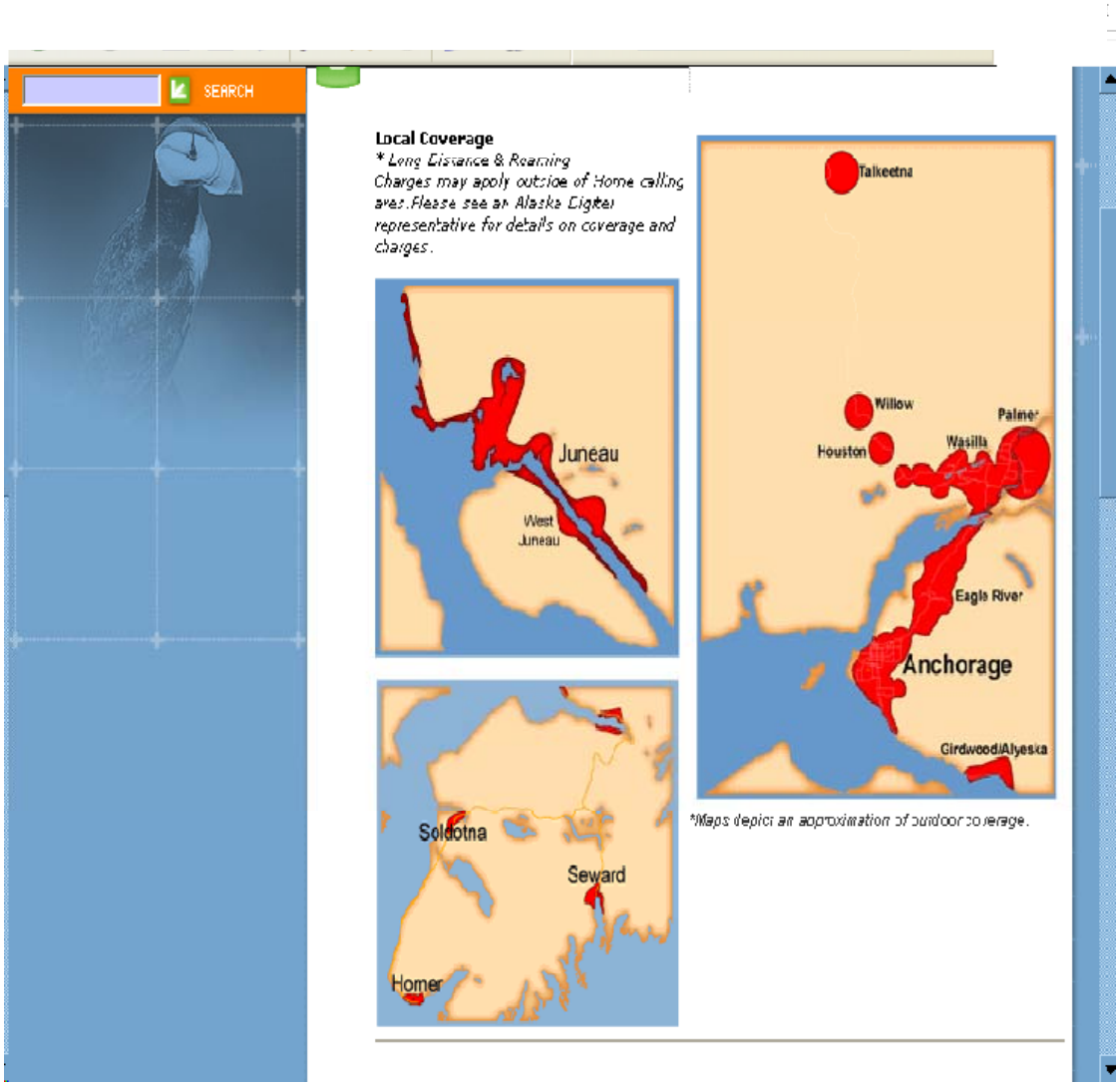
**The coverage shown near Valdez and Cordova is via roaming with Copper Valley Wireless. ACS plans 2006 CDMA facilities construction in the region.**

**Figure 4**
**Cordova Wireless Communications Coverage**




Note: General coverage indication hand drawn from inspection of North Slope Telecom map.

**Figure 5**
**Alaska Digitel Coverage**



## I. ALYESKA PRIVATE BACKBONE COMMUNICATIONS SYSTEM

Alyeska Pipeline Service Company operates a private communications network in support of the pipeline operations. This system includes a microwave radio system which is operated by AT&T Alascom along the length of the Pipeline from Valdez through Fairbanks and north to Pump Station No. 1. Also included are circuits on the fiber which is owned and operated by GCI along the Pipeline route. The radio facilities are presently in the process of being upgraded and modernized. Critical Alyeska circuits are provided on this private system. A special network operations center is staffed by AT&T Alascom in Fairbanks to monitor and maintain the radio network. As a result of this system, Alyeska facilities in Valdez would not be isolated by a failure of the commercial IXC facilities serving Valdez. Critical communications between Alyeska facilities would continue and connections to the PSTN would be available via the Alyeska PBX (private branch exchange) switches in Fairbanks and Anchorage. The AT&T provided radio system was constructed to stringent reliability specifications to meet the requirements of Alyeska Pipeline Service Company.

## J. STATE OF ALASKA TELECOMMUNICATIONS SYSTEM (SATS)

The State of Alaska Telecommunications System (SATS) includes an extensive microwave radio system deployed throughout Alaska to connect the State offices and to support emergency response and other State public maintenance and operations activities. This system includes a route connecting Valdez to Anchorage through Glennallen and a route from Valdez to Cordova through Prince William Sound as well as routes through the Kenai Peninsula south of Anchorage to Seldovia and Seward. The microwave system provides connectivity to the network of VHF repeaters along the route which support communications to mobile radio users throughout a wide area along the road system and along portions of the marine environment including Prince William Sound. The State microwave sites are redundant hot standby and the system is monitored at the Anchorage Tudor Road facility. The State microwave provides 4 T1's of bandwidth to Valdez and two are in active service. This SATS bandwidth would provide continued communications out of the Valdez area for critical government communications in the unlikely event of a failure of the commercial IXC facilities serving the area.

Service to the SOA remote VHF repeaters is dependent upon capacity provided by the SATS microwave.

## K. TACTICAL EMERGENCY RESPONSE COMMUNICATIONS FACILITIES

The fixed government and commercial communications assets that are deployed in the PWS region are described in this document as well as the tactical facilities that are available for special deployment as necessary to support a spill response. The tactical facilities consist primarily of mobile VHF/UHF radios, VHF/UHF base stations and repeaters, and portable Inmarsat, Iridium, and Globalstar satellite phones.

### 1. Alyeska Equipment

The most extensive inventory of emergency response communications assets in the Prince William Sound region is provided by Alyeska Pipeline Service Company. These assets include the Valdez Emergency Operations Center itself. This facility is abundantly equipped with work stations and communications facilities to be utilized by temporary staff from various organizations that are heavily involved in the incident response activities. Office space is provided in the facility for staff from:

- Alyeska
- Prince William Sound Regional Citizens' Advisory Council (RCAC)
- U.S. Coast Guard
- State of Alaska Department of Environmental Conservation (ADEC)

These offices are connected to the LANs of the respective organizations by the cable facilities of CVTC or GCI. The facility is served via a Nortel Meridian PBX which is connected to the PSTN via CVTC. A CentraComm II communications console is staffed by Alyeska in the VEOC. The console has access to VHF, UHF, and HF radios located at the facility. A standby generator and short duration UPS (uninterruptible power system) ensure uninterrupted power within the facility. The VEOC becomes the command center for activities associated with an oil spill or other emergency event related to the oil industry operations in Prince William Sound. The VEOC is connected to the PSTN and to the Alyeska communications network at the VMT via CVTC cable. The connection to the Alyeska network at the VMT is backed up with an Alyeska owned microwave radio. The voice and network data traffic between VEOC SERVS and VMT is distributed between T1's on the cable and T1's on the radio to provide diversity and added reliability.

Other Alyeska emergency response communications equipment and the use of the equipment is identified in the Alyeska Oil Spill Contingency Plan Document CP-35-2, Part 3, SID 2, Section 3. This equipment includes:

- Hand held VHF radios, approximately 140 in the Valdez area
- Portable Inmarsat terminals, 2 ea.
- Thrane & Thrane transportable VSAT Inmarsat earth stations, 2 ea.
- Mobile Communications Modules (MCM) in transportable shelters
  - 2 ea. - 8x12 shelters, 1 ea.- 8x20 shelter
  - Include VHF radios, air to ground base stations, communications console and provisions for connection to Alyeska network near RGV or Pump Station locations
- Iridium satellite phones, 10 ea.
- Portable VHF repeaters, 2 in Valdez area, others along Pipeline

## 2. State of Alaska Department of Environmental Conservation Equipment

A description of the State ADEC emergency response communications equipment is presented in the Unified Plan, Annex E, Appendix V, Tab B. This equipment includes:

- 3 Imarsat M suitcase satellite terminals
- 4 suitcase portable VHF repeaters
- 2 suitcase portable UHF repeaters
- A large compliment of hand held VHF and UHF radios as further itemized in the referenced section of the Unified Plan
- Hand held Iridium satellite phones

The four portable VHF repeaters can be deployed as necessary to support the response activities associated with an oil spill event. Two of these units are stored in Anchorage, one in Fairbanks, and one in Juneau. Two repeater extender radios are stored in Anchorage. The repeater extenders can be strategically placed about 10 to 15 miles apart to extend the coverage provided by the portable repeaters. The ADEC responders have portable VHF radios for system access and the ADEC maintains an inventory of portable radios that can be assigned as necessary.

## 3. Federal Equipment

The Unified Plan, Annex E, Appendix 1, Tab A identifies portable communications equipment which is owned by the USCG. The equipment includes:

- Hand held VHF radios
- Portable UHF radios
- HF radios
- A portable VHF base station

The contact information for deployment of the USCG resources is identified in the Unified Plan reference identified above.

## 4. Response Planning Group Equipment

The Tanker operators in the region have their individual company Emergency Response Plans and communications support equipment including VHF, UHF, and HF-SSB radios as well as VHF and UHF basestations and repeaters.

## 5. Municipal/Borough Equipment

The municipality emergency response teams within the region also typically have a compliment of VHF and UHF hand held radios and one or more Iridium or Globalstar satellite phones available for assignment to support emergency response activities by municipal responders, The municipal dispatch centers can be contracted regarding the availability and assignment of this equipment.

## 6. Unavailable but Useful Additional Equipment

Response assets that would be useful and which have not been identified as presently available include:

- Spread spectrum transportable radio systems including the radios, antennas, and ancillary access equipment which could quickly be deployed to provide relatively high bandwidth connectivity between line of sight locations. This asset could be utilized to restore a failure of an existing facility or to provide additional communications bandwidth and capability to an area of concentrated response activity.
- Transportable earth stations that have companion communications packages at public carrier metropolitan earth stations and which have connections to the PSTN. These earth stations would provide higher bandwidth than the Inmarsat, Iridium, or Globalstar terminals. Arrangements for transponder capacity to support the use of tactical earth stations during large disaster response activities would be required. Tactical response earth stations could include small wireline switches and possibly wireless local loop technology.
- A portable cell site, often called a cell on wheels (COW) that is assembled in a highly portable package and which is prearranged to operate into one of the cellular service provider switches would be a useful tactical communications asset. The COW could be used with the spread spectrum radio or transportable earth station to connect to the cellular switch.

How these additional assets could be utilized during spill response efforts is discussed further below.

**Spread spectrum radios**

Spread spectrum radios do not require licenses from the Federal Communications Commission (FCC) and can therefore be quickly deployed to areas requiring temporary or emergency service. The radios are available in bandwidths ranging from a single voice channel to a DS-3 (digital signal, level 3), which is equivalent to 672 voice channels. The radios operate in the 2.4 GHz or 5.8 GHz unlicensed microwave bands and are suitable for providing service on line of sight paths up to approximately 30 miles in length. As tactical emergency response tools, the spread spectrum radios could be utilized in the following ways:

1. **Emergency restoral tool**

   Spread spectrum radios could be utilized to provide temporary emergency restoral capacity for failed public or private communications facilities within the regional local service areas. This could be to provide service to the local exchange office upon failure of a cable or telephone company electronic service node such as a digital loop carrier system. The radio could also be utilized to provide connectivity between critical emergency response points such as the VEOC and the VMT in the event of a failure of the cable or existing fixed radio systems between these locations. Typical radio configurations for this application would involve the use of radios with one to four T1's (trunk level 1 digital signal). Each T1 is equivalent to 24 voice channels.

2. **Capacity expansion tool**

   Radios with multiple T1's of capacity could be utilized to quickly establish additional capacity to locations within the local telephone company service area that might become overloaded as a result of extraordinary levels of call activity. Overloading of local telephone facilities could result to enterprise locations served with digital loop carriers or switch remotes or to locations where the copper cables are fully utilized.

3. **New service location tool**

   In the event of a spill event, spread spectrum radios could be utilized to quickly provide connectivity for telephone or private enterprise communications service to the area of the activity where public service may not presently be available. The area would need to have line of sight connectivity to a location provided with public telecommunications service or to a USCG or State of Alaska microwave repeater with available transport capacity. In this application the radios would connect to the telephone company switch or to the private branch exchange (PBX) of a responding agency, such as Alyeska or the ADEC.

This application might also be used to provide the transport capacity to a transportable cellular radio facility.

**Transportable Earth Stations**

The use of Inmarsat, Iridium and Globalstar transportable earth stations for emergency response activities has been previously discussed in the document. The Iridium and Globalstar systems are excellent portable tools for providing phone service to small handsets in remote regions. Larger earth stations which are integrated into vehicles or small shelters and which are transportable via helicopter or along the road system by truck could be used to provide temporary phone service to areas of exceptional service need during a major response activity. These stations differ from the Iridium and Globalstar systems in that they could be integrated with small wireless or wired telephone switches and would provide higher levels of capacity to serve a larger number of users. It would be necessary to have an interconnection agreement with one of the satellite based inter-exchange carrier (IXC) service providers such as AT&T Alascom or GCI so that the stations could be assured of having emergency satellite capacity available and the ability to connect to the communications network via the gateway earth station of the cooperating IXC. These larger earth stations could also be equipped to support video or higher speed data service than the smaller satellite terminals.

**Portable Cellular Sites**

Cellular service providers often have transportable cell sites on wheels (COWs) which can be deployed within the service area to provide temporary service or additional capacity until more permanent facilities can be constructed. Cellular service providers in the region may presently have COWs available that could be deployed in the event of the temporary service demand resulting from the response to a spill event. However the COW of the service provider may not be available and the commercial service provider may not be interested in a temporary deployment to support spill response activity. A dedicated portable cell site established to support spill response activities could be established in cooperation with one or more of the cellular service providers in the area. The COW technology would need to be compatible with the network of the cooperating wireless service provider(s) and an interconnection agreement with the wireless carrier would be needed to ensure that the transportable cell site could be connected to the switch of the cooperating carrier during a period of emergency response deployment.

# COMMUNICATIONS EMERGENCY RESPONSE PLAN (CERP)

Following an oil spill or other natural disaster, the availability and effective use of communications are critical to the success of the incident response effort. Effective communications involve the use of the public and private electronic communications facilities described in this document to communicate with the responders in the field, to communicate with the responder organization support and executive staff outside of the impacted region, to communicate with critical equipment and service providers, to enable effective information sharing between the responding organizations, to provide status information to the news media, and to enable normal personal and business communications for the public within and external to the impacted region. Much has been accomplished since the Exxon Valdez spill event to improve the communications support for a spill response effort in the region. These accomplishments involve the improvement to the communications infrastructure serving the region and improvements to the planning documents that will guide the response to any future events. The following planning documents have been developed to guide the effective response to an oil spill event in the Prince William Sound area:

- The Alyeska Plans
  - Valdez Marine Terminal Oil Spill Contingency Plan, Document CP-35-2
  - Prince William Sound Tanker Oil Discharge Prevention & Contingency Plan
    - Volume 1
      - Part 1: Response Action Plan
      - Part 2: Prevention Plan
    - Volume 2
      - Part 3: Supplemental Information
      - Part 4: Best Available Technology
- The Unified Plan
- The Prince William Sound Subarea Contingency Plan

A third Alyeska Plan deals with oil spill prevention and response along the pipeline north of Valdez and is titled: TransAlaska Pipeline Oil Spill Discharge Prevention & Contingency Plan, Document CP-35-1.

It is stressed that each of these plans contain sections on communications and the assignment of tactical communications resources as well as on the command and control system that governs a spill response event. Valuable information is presented in the communications sections of these plans regarding the availability and use of communications response facilities. Operating frequencies and organizational contact information are presented in these documents. Substantial detail on all aspects relating to spill response is included in the referenced documents and is not extracted and duplicated in this presentation.

The Alyeska Plans designate the Alyeska Communications SCADA Technician Lead as the COMMUNICATIONS OFFICER to determine and allocate the Alyeska communications facilities to be utilized in response to a spill event. The contact number for the Alyeska COMMUNICATIONS OFFICER is identified as 907-834-6564. The Alyeska Plan documents include detailed information on the response facilities of Alyeska Pipeline Service Company and the VHF, UHF, and HF operating frequencies being utilized by Alyeska and other critical response agencies including the USCG and FAA.

The Unified Plan is a joint Federal/State Alaska Preparedness Plan to guide a coordinated agency response to discharges or releases of oil or other hazardous substances within the boundaries of Alaska and its surrounding waters. Major but not exclusive contributors to the Unified Plan are the U.S. Coast Guard and the Alaska Department of Environmental Conservation. The Plan includes a detailed description of State and Federal communications resources that are available to support the response activities following a spill event in Alaska. The Unified Plan designates the Seventeenth District Telecommunications Branch of the U.S. Coast Guard as the Federal organization responsible for the management of the Federal Government communications resources in response to a spill event. The contact numbers identified in the Plan are (907) 463-2318 during working hours or via the 24 hour Command Center at (907) 463-2000. Appendix V of the Unified Plan describes the Federal (Tab A) and the State (Tab B) communications resources that are available to support the response to a spill event.

The Unified Plan is an umbrella statewide response plan which is supplemented by detailed Sub-area Contingency Plans. The Sub-area Contingency Plans include the details associated with the particular regions of Alaska. There are 10 Regional Plan documents that present the material that is unique to each of the particular areas. The Prince William Sound Subarea Contingency Plan is a subarea plan of the Unified Plan for the State of Alaska that guides the response to spill events in the Prince William Sound Region. The Resources Section of the Subarea Plan contains particular information about communications assets available to support the response to an oil spill event.

The response to disaster events, other than an oil spill, is governed by the ADEC Alaska Emergency Operations Plan which would activate the State Emergency Coordination Center (SECC) at the National Guard Armory on Elmendorf Air force Base. An oil spill event which is coincident with a larger disaster circumstance, such as an earth quake and/or tsunami, could be governed by the Alaska Emergency Operations Plan from the SECC. This would not normally be the case for an oil spill event that is not associated with a more widespread disaster circumstance.

In addition to the previously mentioned plans, the marine operating companies have planning documents that guide the response activities of the marine crews on board the tankers and tugs operating in the region. The plans guide the reporting to the regional emergency response organizations and impacted communities as well as the reporting and escalation within the companies that own and operate the impacted vessel. These plans include the following documents:

- SeaRiver Emergency Response Plan
- Alaska Tanker Vessel Response Plan
- Chevron Vessel Response & Immediate Response Plans with the PWS Alaska Supplement
- ConocoPhillips Polar Tankers Vessel Response Plan
- Tesoro Alaska Company PWS Vessel Discharge Prevention & Contingency Plan

The communications assets on the ocean going vessels for reporting disaster circumstances will include:

- VHF marine radio, regional coverage
- HF-SSB radio, long range coverage
- UHF radio, local coverage
- Inmarsat terminals, nearly global coverage

In addition, the Alyeska SERVS vessels in the region carry Globalstar satellite phones. This document recognizes that substantial information governing communications in response to a spill event is included in the body of existing planning documents as herein referenced. The detailed planning documents are prepared by ADEC, USCG, Alyeska, and the marine shipping companies that would be directly impacted by and involved in the response to an oil spill event. For the most part the communications facilities that are referenced in the planning documents are the government and Alyeska owned and operated VHF, UHF, and HF radio systems. The public communications system would also be heavily utilized to support the response to a large spill event by providing the largest bandwidth facilities between the responders and the non-responding public in the impacted region and the remainder of the world. These public systems provide the major access to the local phone systems, to the Internet and to the cellular service providers. The public communications carrier facilities are continuously deployed and operating and do not need to be dispatched to support a spill response. However in the event of a large spill, it may be necessary to add temporary capacity to elements of the public network. A natural disaster that results in an oil spill which is coincident with a failure of one or more elements of the public communications network is perhaps a worst case scenario. The public communications carriers do not have disaster response plans developed to the level of those prepared by the oil industry operating in the regions. The major IXC's do operate continuously manned Network Operation Centers (NOCs) to take trouble calls and initiate response activities. While not published, the telecommunications carriers have general, if not well documented, response plans to deal with failures of the major service assets including the network fiber optic cables and the satellites.

A substantial body of information is contained in the existing Oil Industry Planning Documents with regard to emergency response including the command and control and the use of communications to support the incident response activities. The following general communications response planning steps are presented with the intent that they overlay all existing planning documents and in no way become intrusive to the effective implementation of the existing plans. For instance, these comments do not state that VHF and UHF mobile radios will be appropriately dispatched to the necessary response

personnel as it is considered that will occur within the boundaries of the existing plans and procedures of the responding organizations, including Alyeska, the USCG, and the State ADEC. Given below are general communications response steps that are considered to overlay and supplement all existing plan guidance regarding the deployment of communications in response to a spill event. The full degree of the response activity will depend upon the magnitude of the event and the subsequent response activity.

1. Activate the VEOC.

   This step is existing procedure and involves the staffing of the center by Alyeska, ADEC, USCG, and RCAC personnel.

2. Assign a response communications officer.

   The purpose of this individual is:

   - to coordinate the assignment of response communications assets between agencies as may be necessary to allocate the communications tools in the most effective manner to support the response.
   - to note that the existing communications response plans are known and being followed and to document any failures in the existing plans
   - to assess the effectiveness of the communications facilities in supporting the response activities and to recognize failures and remedies
   - to contact the carriers or response enterprises that may be involved in the implementation of remedies to correct failures or inadequacies of the communications network.
   - following the spill response activity, to prepare a report on the performance of the existing communications plans and facilities and make recommendations for improvements in the plans and additions to the facilities that will enhance the effectiveness of the response to future events.

   The qualifications of this individual should include:

   - a familiarity with the communications sections of the existing Response Planning documents
   - a knowledge of the existing fixed and tactical communications resources in the region
   - a knowledge of the command and control (C&C) hierarchy associated with the response and the ability to effectively assist while operating within the established C&C guidelines.

3. Identify the need to deploy special communications assets to effectively support the response activities.

This does not consider the assignment of mobile radios which should be routinely and appropriately assigned to response personnel though existing policies and procedures. This does consider the deployment of portable VHF/UHF base stations and repeaters to the region of the response activity when the area is not covered by the fixed infrastructure. The assignment and deployment of transportable satellite terminals is within the scope of this item.

4. Monitor the status and the performance of the public communications network and observe and evaluate any deficiencies.

5. Coordinate with the public service providers and encourage the network upgrades or repairs that may be necessary to provide adequate support for the activity within the community.

6. Coordinate with the various response organizations and facilitate a sharing of the tactical communications response assets to the areas of greatest need.

## COMMUNICATIONS NETWORK UPGRADES and NEW TECHNOLOGIES

Since the Exxon Valdez oil spill of 1989, there have been substantial improvements to the communications facilities and response plans in the region. In 1989, IXC service to Valdez was provided exclusively by satellites which are characterized by limited bandwidth. The Valdez area is now served by AT&T Alascom and GCI with two separate high bandwidth fiber optic cables. Substantial amounts of additional bandwidth can be provided on the fiber cables which should prevent or minimize the duration of the call blockage experiences immediately following the high level of activity associated with a major spill response effort. There has also been some build out of the VHF radio and wireless networks serving the area and the Iridium and Globalstar satellite constellations have become available. The Internet and private IP networks have been widely introduced to improve enterprise communications and access to information across the globe. Other known upgrade activities that are pending in the region include:

- Modernization of the SOA VHF radio system including a replacement of the aging analog radios with new radios using digital technology.

- Modernization of the Alyeska private network to include replacement of the legacy analog radios with new digital radios.

- Continued deployment of the ALMR within the PWS region.

- ACS Wireless plans to build CDMA cell site in the PWS region in 2006. This will expand the coverage and the wireless service alternatives.

- GCI plans to place a switch in Valdez and use cable telephony for the provision of local phone service.

- An upgrade of the municipal dispatch centers and mobile radio systems in some communities, including Kodiak.

- The construction of new cell sites in the region by several of the wireless service providers, including Cordova Wireless.

- The terrestrial based communications infrastructure has expanded and replaced satellite earth stations serving various communities. Terrestrial service alternatives have been and continue to be evaluated for various communities including Cordova and Kodiak. These implementations will ultimately provide increased IXC bandwidth to the region.

New technologies, as they have been introduced into the world wide telecommunications network, have been effectively introduced into Alaska and the networks of the Alaskan communications carriers. The current trend in telecommunications evolution involves the deployment of voice over IP (VoIP). Full VoIP technology involves the use of new IP based digital phones with and 10 Base T Ethernet interfaces that will connect to the enterprise LAN network and be converged onto the same communications facilities that otherwise serve the WAN (wide area network) of the enterprise. The public network will eventually evolve away from time division multiplex (TDM) technology in the access and switch infrastructure to IP packet based access and switching. This evolution can be expected to span a period of time which is speculative but considerable. VoIP technology is developing most quickly in enterprise networks with access to the PSTN provided by a call manager gateway. Public VoIP networks are also growing rapidly with Vonage, Verizon, Packet 8, AT&T and others offering VoIP phone service as an alternative to the legacy service of the incumbent local exchange carriers (ILEC). These public VoIP services are not fully available in Alaska but the national network will increasingly evolve towards VoIP and this will include Alaska. VoIP phone services can presently be obtained in Alaska but the access to the PSTN will be via a gateway in the lower 48 States and calling to other Alaskan location will be toll calls. The public IP traffic (Internet access) carried out of the community of Valdez depends on the same IXC facilities that connect to the CVTC local telephone and wireless switches and which connect the CellularOne Valdez cell site to the Anchorage switch. Hence IP networks share the same dependency as the PSTN on the IXC fiber cables that serve the region.

There is no immediate compelling advantage or special applicability of VoIP services to the communications associated with the response to an oil spill event in PWS. Access to the PSTN which is independent of the CVTC local telephone switch can be provisioned by subscribing to one of the national VoIP service offerings. The access to the VoIP service gateway would be provided via the Internet. The VoIP gateway would then connect to the public phone system in a community in the lower 48 state where the service was offered. Local dial tone would be provided from a switch in the community where the VoIP to PSTN gateway was located and calls to Alaska would be toll long distance calls from that community. The only advantage to a subscription to this service

would be the ability to access the PSTN during the unlikely event of a failure of the local CVTC switch. This same ability is provided by ordering a foreign exchange (FX) circuit from one of the inter-exchange carriers. The FX circuit is a phone line which is extended off of a switch in a distant community. The USCG MSO Valdez facility has an FX line off of the Anchorage switch and various other emergency response organizations in the area are likely to have FX lines in operation. The value of having FX or VoIP services with access to the PSTN from switches in communities outside of the Prince William Sound region will also become less valuable as GCI introduces competitive local exchange service in the Valdez area.

As new technologies are introduced into the national network, they are quickly introduced in the Alaskan network. There is currently no known communications service alternative that is available and particularly useful to support a spill response effort that is not presently deployed or in the process of being deployed in the region.

The wireless cellular networks are evolving to support advanced data services at higher rates. Hence the mobile wireless clients are more able to provide data services including email and access to the Internet. CellularOne offers wireless data access using GPRS (General Packet Radio Service) technology and the ACS Wireless CDMA network will support data rates to wireless laptops and PDAs (personal digital assistants) at rates up to 512 kbps. These wireless data services will enable the transfer of data between metropolitan support centers and mobile responders located within the coverage area of the Cellular service providers. The ACS Wireless service which will be introduced into the region in 2006 will include 1xEV-DO (1xEvolution-Data Optimized) which will support data bursts at rates up to 2.4 Megabits per second (Mbps) to portable computers and other mobile data appliances.

Tactical response assets which could be added the enhance the emergency response communications capability in the region have previously been identified and discussed.

# CONCLUSIONS

The community of Valdez is abundantly provided with bandwidth to the national telecommunications network via two fiber optic cable systems. These cables provide Valdez with communications bandwidth to support long distance calling, private line services, and Internet access. Each fiber cable has a system capacity of an OC-48 which is equivalent to 32,256 full bandwidth voice circuits per cable. While all of this capacity is not equipped to serve Valdez, it can be concluded that there is substantial capacity that can be accessed on the cables at Valdez and additional capacity to support the increased demand associated with a major spill response effort could be quickly provisioned. This bandwidth should prevent the blocked calls that were experienced during the early days of the Exxon Valdez spill response activity.

Within the local service area of Valdez the facilities of Copper Valley Telephone Cooperative remain critical to providing connections to the inter-exchange facilities leaving the region and to providing local telephone service. While cable cuts are a common plague of local exchange service providers, those cable cuts are not typically associated with oil spill events and CVTC and the other telephone service providers in the region routinely deal with cut cable and are well equipped and trained to repair the cables. The most critical facility of CVTC and the other telephone companies serving the PWS region is the central office switch. A complete failure of the switch would eliminate public telephone service and would constitute a communications emergency without a spill response event in progress. The complete loss of a major telephone switch is rare and it is only in the very worst case disaster circumstance that such a loss would occur simultaneous with an oil spill event. A more likely service failure within the local service area may involve a call blockage circumstance at a selected service point that is served by a remote or digital loop carrier off of the main telephone exchange. A detailed assessment of how the critical offices within the local service area of CVTC are served is beyond the scope of this project and would require further analysis of the local service facilities. If a local service blockage circumstance has ever been observed to any location that is critical to the spill response effort, it has not been reported during the data collection associated with this project. Any local service blockage circumstance resulting from substantial increases in the phone usage from a critical location could be remedied by CVTC through minor facility additions after the problem became apparent.

The importance of the local telephone company facilities in providing communications during a spill response effort is emphasized. As competition is introduced into the local service arena, care must be taken that competitive economic pressures on the local service providers do not result in network compromises that could impact network capacity, reliability, or the emergency response capability of the local service providers. Competition in the provision of local service may also result in multiple independent networks and additional capacity which ultimately benefits network reliability and disaster preparedness.

The public phone network local and inter-exchange facilities are generally adequate to support the increased level of activity expected following a spill response event that is

centered in the community of Valdez. Additional local and wireless facilities and service alternatives are planned for the Valdez area in the near future. The replacement and modernization of existing systems has been evident in the PWS region and is continuing.

Major activities that are centered outside of the reach of the public wired telephone network will depend upon the use of the low capacity VHF and cellular systems operating in the region. Contention for the use of the VHF channels is well managed in that the channels are utilized by professionals operating in the region and communications are restricted to essential matters relating to transportation safety and the critical response activities. Priority access to cellular service may be possible to assign to critical responders in the area through cooperation with the wireless service providers. Tactical communications facilities would need to be deployed to provide communications capacity to the remote areas that may not presently have service. A primary factor in providing effective communication in response to an oil spill event involves recognizing the availability of the tactical response assets of the various response organizations and ensuring the prompt and effective assignment and use of those resources. This may involve sharing and coordination between the private and government response stakeholders. The cooperative deployment of the ALMR VHF system is designed to improve the inter-agency communications and cooperation which is essential to an effective coordinated spill response effort. It is also noted that the tactical response facilities are primarily VHF systems that would only provide low capacity and restricted communications for the use of critical responders. Other tactical response assets which might be added to provide additional capacity have previously been described in this report.

A periodic audit and updating of the various spill response documents is essential in ensuring that the documents are up to date and suitable for guiding the response to a spill event. The success of a spill response effort depends upon the effective deployment and utilization of the available communications resources. Any failures of the communications network to support an actual event response effort should be documented and acted upon to correct the facility or command and control failure.

The proper telecommunications tools are deployed in the Prince William Sound region to support disaster response activities in the region. No major network deficiencies or missing but readily available technology tools are apparent.

# ACRONYMS AND ABREVIATIONS

| | |
|---|---|
| ACS | **A**laska **C**ommunications **S**ystems |
| ADEC | **A**laska **D**epartment of **E**nvironmental **C**onservation |
| ADM | **A**dd **D**rop **M**ultiplexer on a SONET system |
| ALMR | **A**laskan **L**and **M**obile **R**adio System |
| APSC | **A**lyeska **P**ipeline **S**ervice **C**ompany |
| ARR | **A**laska **R**ail**r**oad |
| ARTS | **A**lyeska **R**adio **T**elephone **S**ystem |
| BCS | **B**ackbone **C**ommunications **S**ystem |
| BLSR | **B**i-Directional **L**ine **S**witched **R**ing |
| C&C | **C**ommand **a**nd **C**ontrol |
| CDMA | **C**ode **D**ivision **M**ultiple **A**ccess |
| CERP | **C**ommunications **E**mergency **R**esponse **P**lan |
| COW | **C**ell **O**n **W**heels |
| CTAF | **C**ommon **T**raffic **A**dvisory **F**requency |
| CTC | **C**ordova **T**elephone **C**ooperative |
| CVEA | **C**opper **V**alley **E**lectric **A**ssociation |
| CVTC | **C**opper **V**alley **T**elephone **C**ooperative |
| CVW | **C**opper **V**alley **W**ireless |
| DOT | State of Alaska **D**epartment **o**f **T**ransportation |
| DS-3 | **D**igital **S**ignal, Level **3** (digital signal equivalent to 672 voice channels) |
| EDGE | **E**nhanced **D**ata **G**SM **E**nvironment |
| EOC | **E**mergency **O**perations **C**enter |
| FAA | **F**ederal **A**viation **A**dministration |
| FCC | **F**ederal **C**ommunications **C**ommission |
| FOC | **F**iber **O**ptic **C**able |
| FSS | **F**light **S**ervice **S**tation |
| FTS | **F**ederal **T**echnology **S**ervice |
| FX | **F**oreign **E**xchange telephone line |
| GPRS | **G**eneral **P**acket **R**adio **S**ervice |
| GSM | **G**lobal **S**ystem for **M**obile Communications |
| ILEC | **I**ncumbent **L**ocal **E**xchange **C**arrier |
| IP | **I**nternet **P**rotocol |
| ISP | **I**nternet **S**ervice **P**rovider |
| IXC | **I**nter-e**x**change **C**arrier |

## ACRONYMS AND ABREVIATIONS, continued

| | |
|---|---|
| LAN | **L**ocal **A**rea **N**etwork |
| LEC | **L**ocal **E**xchange **C**arrier |
| LEO | **L**ow **E**arth **O**rbit Satellite |
| MSO | **M**arine **S**afety **O**ffice |
| NHTI | **N**ew **H**orizons **T**elecom, **I**nc. |
| NOCC | **N**etwork **O**perations **C**ontrol **C**enter |
| PBX | **P**rivate **B**ranch **E**xchange |
| PDA | **P**ersonal **D**igital **A**ssistant |
| POP | **P**oint **o**f **P**resence |
| PSAP | **P**ublic **S**ervice **A**ccess Point |
| PSTN | **P**ublic **S**witched **T**elephone **N**etwork |
| PWS | **P**rince **W**illiam **S**ound |
| RCAC | **R**egional **C**itizens' **A**dvisory **C**ouncil |
| RCAG | **R**emote **C**ommunications **A**ir/**G**round |
| RCO | **R**emote **C**ommunication **O**utlet |
| ROW | **R**ight **o**f **W**ay |
| SADC | GCI **S**outh **A**nchorage Distribution **C**enter |
| SADC | GCI **S**outh **A**nchorage **D**istribution **C**enter |
| SATS | **S**tate of **A**laska **T**elecommunications **S**ystem |
| SECC | **S**tate **E**mergency **C**oordination **C**enter |
| SERVS | **S**hip **E**scort **R**esponse **V**essel **S**ystems |
| SOA | **S**tate **o**f **A**laska |
| SONET | **S**ynchronous **O**ptical **Net**work |
| T1 | **T**runk level **1**, a digital signal equivalent to 24 voice channels |
| TAC | **T**echnical **A**ssistance **C**enter |
| TDM | **T**ime **D**ivision **M**ultiplex |
| TKCC | **TKC C**ommunications |
| UPS | **U**ninterruptible **P**ower **S**ystem |
| USCG | **U**nited **S**tates **C**oast **G**uard |
| VEOC | **V**aldez **E**mergency **O**perations **C**enter |
| VMT | **V**aldez **M**arine **T**erminal |
| VoIP | **V**oice **O**ver **I**nternet **P**rotocol |
| WAN | **W**ide **A**rea **N**etwork |

# CRITICAL COMMUNICATIONS CENTER CONTACT LIST

| Contact | Phone Numbers | |
|---|---|---|
| | Toll free | Toll |
| AT&T Alascom NOC | 800-252-7521 | 907-264-8363 |
| GCI NOCC | 800-868-5561 | 907-868-5561 |
| Valdez Municipal Emergency Dispatch | | 907-835-4560 |
| Alyeska Emergency Response Communications Officer | | 907-834-6564 |
| USCG Valdez MSO | | 907-835-7200 |
| Alaska Dept. of Environmental Conservation | | |
| Anchorage | 800-478-9300 | 907-269-7500 |
| Valdez | | 907-835-2824 |
| Alyeska SERVS VEOC | | 907-835-6620 |
| USCG 17th District Telecommunications Branch | | 907-463-2318<br>907-463-200 |