Corrective Action Report
Connector Building Demolition
St. Paul Island, Alaska

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Prepared by:

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ACRONYMS AND ABBREVIATIONS

BSE	Bering Sea Eccotech
HASP	Health and Safety Plan
NOAA	National Oceanic and Atmospheric Administration
PPO	Pribilof Project Office
QA/QC	Quality Assurance and Quality Control
SOW	Statement of Work
TPA	Two Party Agreement

EXECUTIVE SUMMARY

This Corrective Action Report (CAR) describes the demolition of the Connector Building in the City of St. Paul, Alaska. The CAR includes the strategy, rationale, and procedures used to demolish the building.

The connector building was demolished in two stages. In October 2004, NOAA and its contractors removed a wooden structure from inside the building, as well as construction debris and trash. The wooden debris was hauled to the local landfill, and the remainder of the debris was temporarily stored in the Machine Shop. The crew also reinforced the frames of the building and prepared it for demolition. Further demolition could not be carried out, however, due to severe weather.

After a series of storms caused substantial damage to the building in December 2004 and January 2005 rendering it an imminent public hazard, NOAA and its contractors completed the demolition of the building in February 2005. Using a crane, boom truck, and a variety of cutting tools, the walls and roof of the buildings were cut and dismantled, and the free standing frames were dismantled and removed by the crane. With the building completely demolished, NOAA alleviated the imminent hazard from falling metal fragments.

Building components were cut into manageable pieces, as necessary, segregated, and disposed of locally or packed in containers and on flat racks to be shipped off the island for disposal or recycling. NOAA and its contractors ensured the area where the building once stood was cleaned of trash and all visible metal items, and secured by a fence.

1.0 INTRODUCTION

This Corrective Action Report (CAR) describes the rationale, strategy, and execution for the demolition of the metal Connector Building on St. Paul Island, Alaska. The U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA), through its Office of Response and Restoration, Pribilof Project Office (PPO), is responsible for site characterization and restoration activities on St. Paul Island, Alaska. Public Law No. 104-91 of 1995 and Public Law 106-562 of 2000 provide the mandate for these activities. NOAA, as the current owner of the metal Connector Building property, had direct responsibility for its structural integrity. When the Connector Building structural state was found to have deteriorated beyond repair, demolition activity commenced on October 2004, but halted due to severe weather. Several winter storms in December 2004 and January 2005 battered the Connector Building, tearing pieces of sheet metals and hurling them onto the nearby road. The rapid degradation of the building caused it to become an imminent hazard to the community, and necessitated demolition as soon as feasible.

2.0 BACKGROUND

St. Paul Island is located in the Bering Sea, 800 miles west-southwest of Anchorage, Alaska (Figure 1). The metal Connector Building discussed in this CAR was located in the industrial area of the City of St. Paul in Tract 46 (Figure 2). The building served a number of purposes. It was a general warehouse, a repair shop, and finally, a warehouse again.

The Connector Building general orientation was north-south, and its dimensions were approximately 50' by 63' (Figure 3). The structure was a sheet metal covered building, steel framed with steel purlins (Figure 4). It was located between and connected to two wooden structures: the Machine Shop and the Equipment Garage (Figure 5). The Connector Building was constructed in the early 1980s. The Machine Shop and Equipment Garage were constructed prior to World War II.

The Connector Building was free standing, with a center frame and two side frames, the columns of which were bolted to reinforced concrete footers. Steel purlins and rods connected the frames to provide structural stability. Corrugated steel metal was fastened by bolts to the purlins on the roof and the west and east walls. The south end of the Connector Building was connected to the Machine Shop's north wall, apparently only by flashing and caulking. The top, gable-shaped section of the north wall was made of wood frame covered with plywood and metal siding, and rested on the roof of the community garage. An interior wooden structure, with two separate rooms and a ceiling, was adjacent to the west wall of the Connector Building (Figure 6).

On the east wall there was an overhead roll-up cargo door (approx. 12' by 12') and a sliding cargo door (approx. 12' W by 14' H), which in the past had opened by sliding to the north. The rollup door became corroded and ceased operating in 2000. The sliding door fell off its tracks, was damaged by the wind, and could no longer be opened in 2003.

A third, small personnel door was located at the southeast corner of the metal building. On the northwest corner there was a window.

The weather on St. Paul Island is harsh. The average wind speed is 18 miles per hours, and gale-force winds exceeding 70 mph are not uncommon, especially in the winter time. Moisture in the air contains salt, and wind carries the salty spray from the breaking waves, coating exposed surfaces. Metal corrodes quickly on the Pribilof Islands, and the Connector Building was no exception. Despite its relatively young age, purlins holding the sheet metal of the roof and siding corroded to the point where their structural integrity was completely compromised (Figure 7). Likewise, bolts holding roof sheet metal corroded and could no longer hold the sheet metal in place.

Considering the deteriorated state of the building and the fact that repairs could not be done economically and safely, NOAA decided to demolish the building and proceeded to do so in October 2004. NOAA was unable to complete the demolition at that time due to severe weather. During storms in 2004 and early 2005, sheet metal from the roof and siding broke lose and landed on the road nearby. The building became an imminent hazard to the community. Demolition of the Connector Building became a high priority.

The corrective action objectives included:

- Preparing an effective and safe demolition plan;
- Demolishing the interior wooden structure in the building;
- Removing of interior trash and debris;
- Constructing temporary support struts and cables to reinforce the building and prevent it from collapsing prematurely during demolition;
- Mobilizing personnel, equipment and supplies to the site;
- Blocking off vehicle and pedestrian traffic near the site, and advising the community of detour routes;
- Dismantling the east wall and doors, and the west wall;
- Dismantling the roof in sections;
- Dismantling the frames of the building;
- Dismantling and cutting building components into manageable pieces;
- Segregating building components into separate waste streams: general debris, wooden debris, metal debris, and metal beams;
- Hauling wooden debris to the local landfill;
- Loading debris into containers, loading metal debris and beams into containers and flat racks.
- Staging containers and flat racks for shipping; and
- Reporting the demolition activities.

3.0 SITE DESCRIPTION

The Connector Building was located at the base of Village Hill in Tract 46 in the industrial area of the City of St. Paul**.** It was constructed between the Machine Shop and Equipment Garage (a.k.a. Equipment Shed, Community Garage). The Connector

Building east wall was adjacent to the busy main road connecting the harbor area with the older part of the City of St. Paul, including the store and City Hall. The west wall faced a narrow strip of land and Village Hill.

3.1 GEOLOGY AND HYDROGEOLOGY

Soils in the vicinity of the Connector Building generally consist of fill material including sand, scoria, and gravel from the surface to a depth of 4 to 12 feet below ground surface (bgs). Groundwater in the vicinity of the Machine Shop is present at approximately 4 feet above mean sea level, and likely flows to the north toward Village Cove. The water is not potable (Mitretek Systems. 2002). Demolition activities were conducted above ground only, and did not affect groundwater or the soil under the building.

3.2 TYPES OF CONTAMINANTS AND POTENTIALLY AFFECTED MEDIA

Demolition activities resulted in the generation of various type of debris. All debris was hauled off the area and either disposed of locally or loaded into containers for shipment off-island. Demolition activity was not expected to effect soil or groundwater.

4.0 CLEANUP LEVELS

Alaska Department of Environmental Conservation (ADEC) soil and groundwater cleanup levels were not applicable during this corrective action. NOAA considered a clean site one clear of the Connector Building, building components, debris, and trash.

5.0 FIELD ACTIVITIES

The following sections summarize the principal activities conducted during the demolition of the Connector Building. Principal activities included mobilization, interior demolition, and cleanup in October 2004, and mobilization and complete building demolition in February 2005.

5.1 DEMOLITION ACTIVITIES, OCTOBER 2004

On October 15 to 20, 2004, NOAA mobilized its contractors, Tetra Tech/Cooper Zietz and Bering Sea Eccotech (BSE), to demolish the Connector Building. A Cooper Zeitz engineer prepared a demolition plan acceptable to NOAA (Cooper Zeitz 2004), and initial demolition of the Connector Building followed. NOAA contractors removed the existing interior wooden structure, and cleaned the interior of the building from debris. Contractors segregated waste into 1) combustible wood, which was hauled to the local landfill and handled by the City of St. Paul according to local ordinances; and 2) other debris, which was stored temporarily in the adjacent Machine Shop.

To support the building, 4” schedule 80 pipe braces were installed from the floor to the center columns of the side frames (Figure 8), and four cables were installed from the outside columns of the side frame to the center frame. The original bracing cables were found to be in good condition and were left in place.

Repeated attempts were made to complete demolition of the building, but a series of storms precluded further demolition work. After the standby time allowed for the project was exhausted, further demolition was put on hold, to be conducted at a later date.

5.2 DEMOLITION ACTIVITIES, FEBRUARY 2005

In December 2004 and January 2005, severe storms caused substantial damage to the Connector Building. Winds battered the front sliding door, throwing it off its hinges and bending its frame. The door had to be tied by ropes and cables to keep it from falling off completely. A number of sheet metal panels on the east (front) side of the Connector Building were torn by the wind and blown onto the adjacent road (Figure 9). Likewise, wind tore several sheet metal panels from the west (back) side of the building, and separated sheet metal siding on the north wall from its wooden frame, leaving it hanging precariously on the roof of the Equipment Shed (Figure 10). The building clearly presented an imminent hazard to the community, making its complete demolition an urgent matter.

As soon as budget and contractual hurdles were overcome, NOAA mobilized its contractors - BSE and Larsen Consulting Group - to complete the demolition of the building. After examining the building closely, the Larsen Consulting Group engineer modified the demolition plan prepared in October by Tetra Tech/Cooper Zeitz, and NOAA and BSE reviewed and approved it (BSE 2005).

After delaying work for two days due to high winds, demolition began on February 7, 2005. NOAA and its contractors blocked the road, erected a fence, and arranged for the local radio station to advise the community to stay away from the demolition area and use alternate routes. Using a boom truck and a 50-ton capacity Grove Crane, BSE removed the large sliding door by attaching the crane to it through holes made in the door, applying tension, cutting the door lose with a cutting torch, and finally lifting the door while stabilizing it with guide ropes and placing it on the ground. There metal and wood pieces were separated (Figure 11). Sheet metal went into the metal debris container, and wood components went to a separate pile for disposal at the landfill.

The wall section above the sliding door was removed in the same fashion. The large and top heavy rolling door was cut from its frame and pushed inward. The wall section around it was cut by torch and removed by the crane. Finally, the door was lifted by the crane and placed in the metal debris conex.

The west (back) wall of the building was removed without the crane. A BSE welder in the boom truck basket torched off the bolts holding the sheet metal to the purlins, and peeled the metal off (Figure 12). The purlins themselves, some of which were extremely corroded, were cut next, followed by a piece of siding on the north wall that hanged on the Equipment Shed roof for some time.

The north wall resting on the Equipment Shed was removed next, first its metal siding and then the plywood and the wooden framing. The metal and wooden components were segregated as before.

With all the walls gone, removal of the roof came next. Approximately three quarters of the roof was removed with the Grove Crane as follows: four holes were cut in the section of the roof to be removed, the crane riggings were inserted and tightened around roof purlins, and the crane applied tension on that section to prevent it from falling uncontrollably. A BSE welder then cut the purlins and sheet metal of that section, separating it from the adjacent roof. When the section was loose, the crane lifted it and with the help of guide ropes placed it flat near the metal debris container, where purlins and sheet metal were separated to maximize the use of container space (Figure 13). In some cases, the roof sections were dropped to the floor and were removed by the loader.

The last one quarter section of the roof was removed without the crane. A BSE welder cut the sheet metal of the roof into narrow sections, each resting on one purlin in its center. The welder then cut the purlin on one end and let the end of that roof section drop. The purlin on the other end was cut next, and the whole section dropped to the floor (Figure 14). The sections on the floor were later removed with a loader and disassembled for recycling.

The building frames were removed next, beginning with the center frame. The crane was attached to the frame and tension was applied. The frame footings were cut from their concrete foundation with a cutting torch. The cables supporting the frame were then cut, and the whole frame was lifted as one unit. The crane slowly pulled it northward and laid it on the ground north of the Connector Building with the help of guiding ropes manned by the entire crew (Figure 15). The side frames were removed half at a time in a similar fashion, each section lifted by the crane and laid flat at the area north of the building for processing (Figure 16).

The Larsen Consulting Group structural engineer supervised and directed all demolition activities. Workers adhered to the NOAA Master Health and Safety Plan (NOAA 2004). On several occasions, work was stopped for safety concerns (e.g., the wind was too strong, the roof was icy and slippery). There were no injuries during this project.

5.3 WASTE MANAGEMENT

The building demolition generated several waste streams that were processed as follows:

Wooden Debris: The wooden debris from October 2004 and February 2005 activities were hauled to the St. Paul municipal landfill, where they were treated according to local disposal ordinances. The City of St. Paul charged NOAA a fee for the disposal of wooden debris at the landfill.

Non Wooden Debris: Non wooden debris such as insulation, plastic debris, insulated wires, and various trash were placed into open-top intermodal containers. NOAA shipped the debris off-island for disposal.

Metal Debris: Metal debris, mostly sheet metals, purlins, cable, and the rolled up door were placed into a metal-only open top container. Care was taken to ensure that no other type of debris was placed in this container. NOAA shipped the metal debris off-island for recycling.

Metal Frames: The metal frames were cut into steel beams of manageable length, and the pieces were placed on flat racks for later disposal. NOAA shipped the metal frame beams and pieces off-island for recycling.

5.4 SITE RESTORATION

The site where the Connector Building once stood became an open lot between the Machine Shop and the Equipment Garage (Figure 17). NOAA contractors cleaned the site of all visible debris, trash, and metal objects. At the time of demolition in February, the ground was covered with ice and snow, precluding a thorough and meticulous cleanup. NOAA tasked BSE to conduct such cleaning when conditions allowed. A fence was erected to prevent public entrance into the area.

No artifacts of historical or cultural significance were found.

6.0 CONCLUSIONS

NOAA PPO and its contractors mobilized to St. Paul, Alaska in October 2004 and February 2005 to demolish the Connector Building. Initial building demolition was conducted in October 2004, but complete demolition was not possible due to severe weather. As a result of 2004/2005 winter storms, the Connector Building became an imminent hazard to the community. NOAA and its contractors mobilized again in February 2005, and completed the demolition of the building, beginning with the sides of the building, then disassembling the roof, and finally the frame of the building. Workers cleaned the area of the Connector Building and erected a fence to prevent public entrance into the area.

Wastes generated during the demolition were segregated according to types. Wooden debris were hauled to the local landfill. General debris, metal debris, and metal beams were packed separately in containers and on flat racks, staged on NOAA property near the harbor, and shipped on or about October 1, 2005 to Seattle, Washington for disposal or recycling no later than December 15, 2005.

7.0 REFERENCES

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Cooper Zeitz, Inc. 2004. *Demolition Plan for Connector Building.* October.

Mitretek Systems. 2002. *Groundwater Use and Classification in the Vicinity of Tract 46, St. Paul Island, Pribilof Islands, Alaska.* May.

National Oceanic and Atmospheric Administration (NOAA). 2004. *Master Health and Safety Plan, Pribilof Islands Site Restoration, St. Paul Island, St. George Island, Alaska.* National Oceanic and Atmospheric Administration, Pribilof Project Office. April.

FIGURES

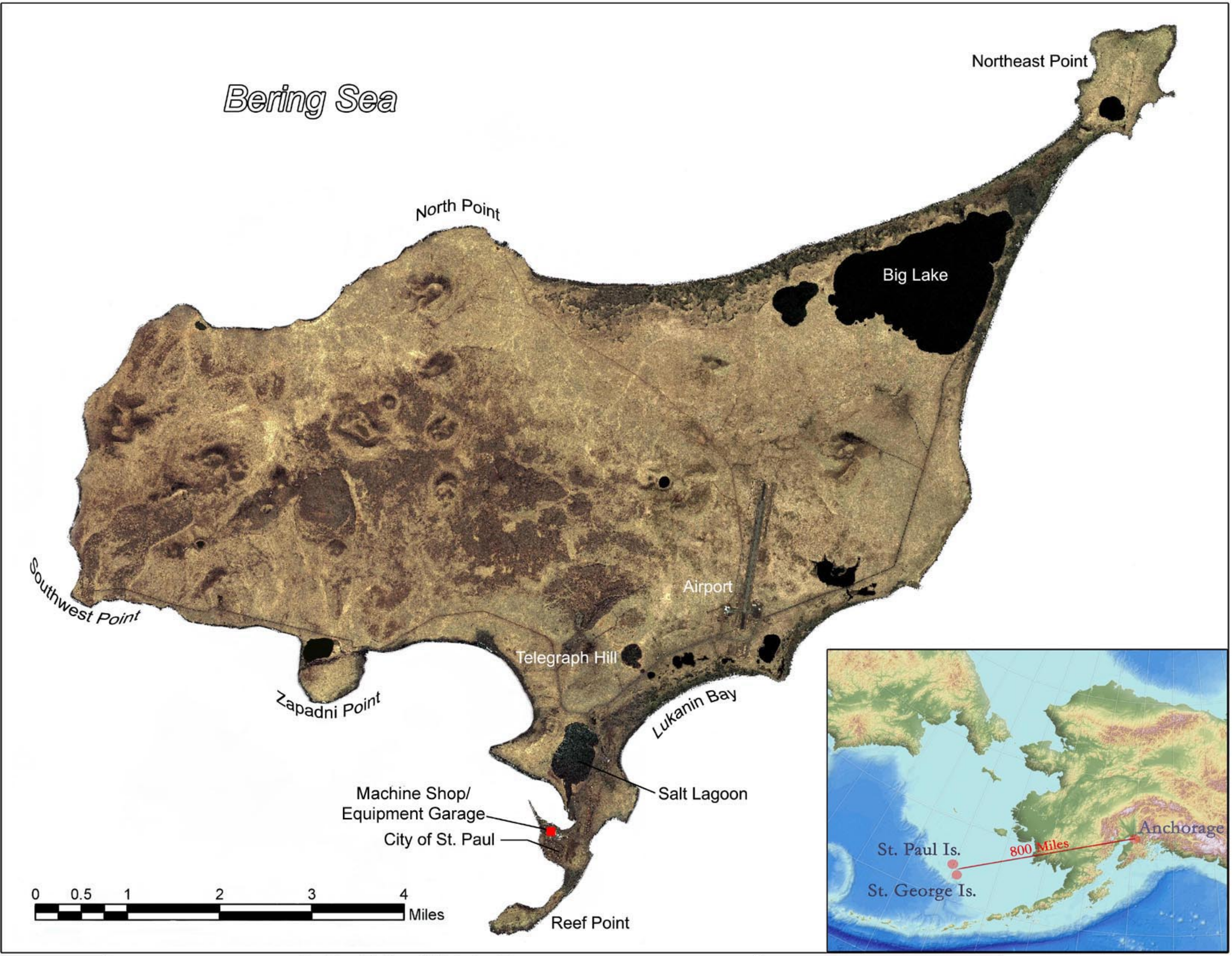

Figure 1	St. Paul Island Vicinity Map Machine Shop/Equipment Garage Site 20/TPA Site 9e St. Paul Island, Alaska	Source: Ikonos Satellite Imagery, 2001	Pribilof Islands Restoration Project

Figure 2	Site Location Map Machine Shop/Equipment Garage Site 20/TPA Site 9e St. Paul Island, Alaska	Source: 1996 Aerial Photo, Aeromap US

NOAA Pribilof Islands Restoration Project

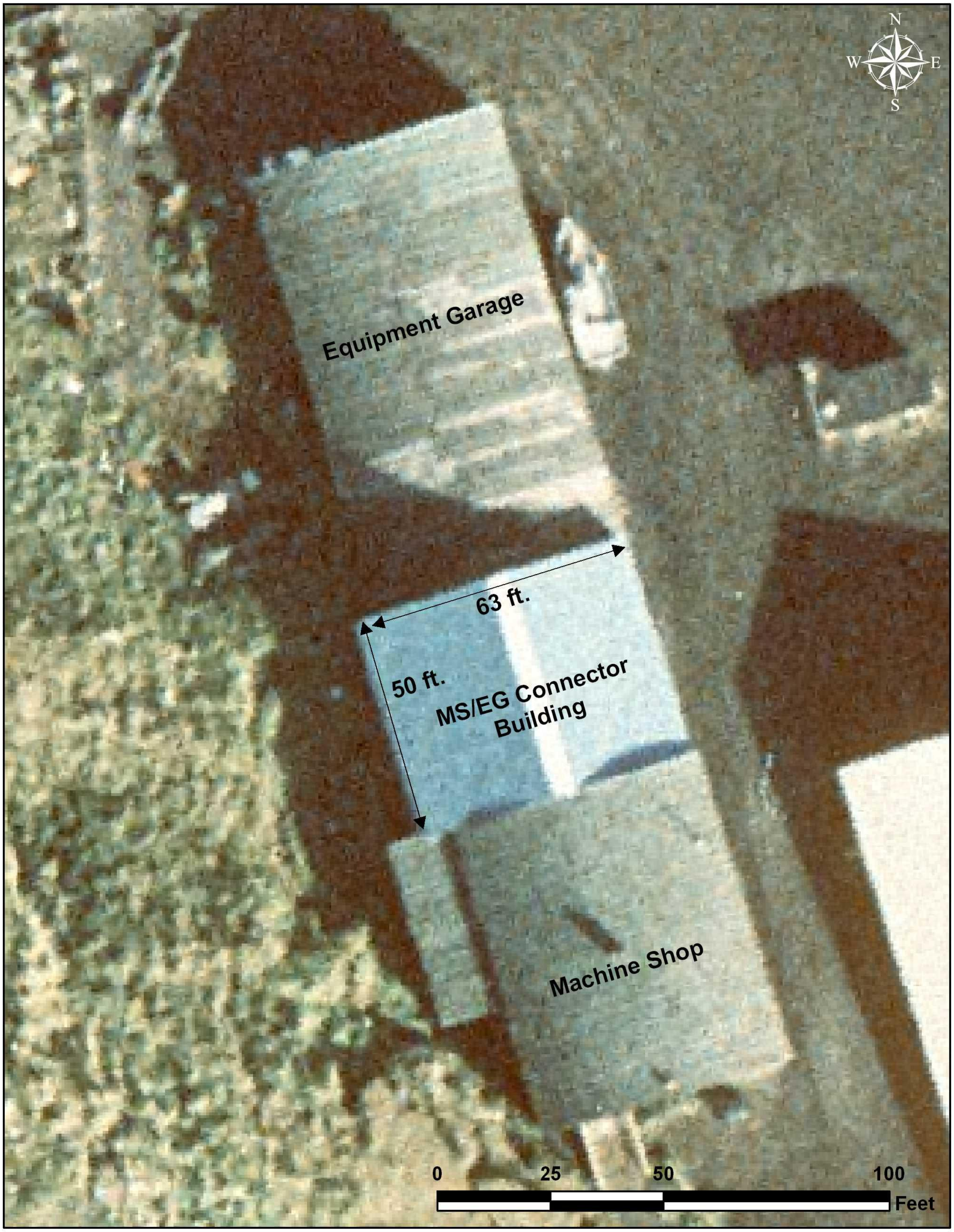

Figure 3	Machine Shop/Equipment Garage Connector Building Dimensions St. Paul Island, Alaska	Source: Aerial Photo (Aeromap 1996).

Pribilof Islands Restoration Project

Figure 4. The eastern (front) side of the Connector Building before incurring major damage, July 2004

Figure 5. Aerial view of the Connector Building before demolition, February 2005

Figure 6. The wooden structure inside the Connector Building

Figure 7. Corroded purlins (near the crack in the roof) and missing roof sheets, July 2004

Figure 8. Bracing a frame of the Connector Building, October 2004

Figure 9. Damaged sliding door and east wall, January 2005

Figure 10. Damaged north and west walls, January 2005

Figure 11. Removal of the sliding door, February 2005

Figure 12. Removal of the west wall

Figure 13. Removal of a roof section with the Grove crane

Figure 14. Removal of roof sections without the crane

Figure 15. Removal of the center frame

Figure 16. Removal of a section of a side frame

Figure 17. Aerial view of the area after the Connector Building demolition