PACIFIC COAST TORPEDO STATION, KEYPORT INDUSTRIAL DISTRICT
(Naval Torpedo Station, Keyport)
(Naval Undersea Warfare Center Division, Keyport, Keyport Industrial District)
Both sides of Second Street, between Dedrick Drive and Liberty Bay and one building west of Dedrick Drive and south of Second Street
Keyport
Kitsap
Washington

HABS WA-255
WA-255

HABS
WA-255

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN BUILDINGS SURVEY
PACIFIC WEST REGIONAL OFFICE
National Park Service
U.S. Department of the Interior
1111 Jackson Street, Suite 700
Oakland, CA 94607

HISTORIC AMERICAN BUILDINGS SURVEY

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Location: Both sides of Second Street, between Dedrick Drive and Liberty Bay, and one building west of Dedrick Drive and south of Second Street, Keyport, Kitsap County, Washington.

USGS Suquamish, Washington, Quadrangle
Universal Transverse Mercator Coordinates (NAD 83):
A - 10.528928.5282996.
B - 10.528932.5283157.
C - 10.528672.5283122.
D - 10.528624.5282938.

Present Owner: United States Department of the Navy.

Present Use: Underwater warfare research and development.

Significance: The Pacific Coast Torpedo Station, Keyport Industrial District, exhibits the qualities and character of a naval torpedo facility of the period from 1914 to 1948. This association with military activities and the development of undersea warfare technologies is significant in the broad patterns of American history. The district currently contains ten contributing buildings, which represent three significant development phases in the history of the base and undersea warfare development:

1. 1914-1919 – The earliest development of the industrial district associated with World War I.
2. 1920-1940 – The inter-war years, including the Great Depression.
3. 1941-1944 – The rapid mobilization leading up to and including World War II.

The following list includes contributing buildings within the district. Building 83 was razed in 2004.

Torpedo Storehouse	(Building 1)	HABS WA-256
Torpedo Storehouse	(Building 12)	HABS WA-257
Torpedo Storehouse	(Building 38)	HABS WA-258
Machine Shop	(Building 73)	HABS WA-259
Naval Hospital	(Building 74)	HABS WA-260
Exploder Building	(Building 81)	HABS WA-261
Foundry and Pattern Shop	(Building 84)	HABS WA-262
Smith Shop (Battery Shop)	(Building 85)	HABS WA-263
Torpedo Assembly Shop	(Building 98)	HABS WA-264
Machine Shop Annex	(Building 233)	HABS WA-265
Maintenance Building	(Building 83)	HABS WA-262

PART I. HISTORICAL INFORMATION

A. Historical Context

1. Background and Location of the Station

The Naval Undersea Warfare Center Division, Keyport (NUWC) is located on a small peninsula that extends into Puget Sound. This projecting spit is part of the larger Kitsap Peninsula, a land mass that lies in the trough between the Olympic and Cascade mountain ranges. This terrain was shaped by repeated glacial activity as successive ice sheets covered the area and then melted, sending water surges that carved out deep inlets and bays. These hydrographic features as well as suitable topography and a strategic location all combined to make Keyport an ideal site for a torpedo testing facility.[1]

American interest in the settlement of this part of the Northwest grew after the discoveries of the Lewis and Clark expedition in the early years of the nineteenth century, and the success of the British Hudson's Bay Company in competition for the region's furs and other resources. The waterways of Puget Sound eventually attracted the attention of the United States Navy, which saw the advantages of Puget Sound for a port and potentially a naval base. Congress had first authorized the President to send naval vessels to explore the Pacific in 1828, but it took another decade before the United States

[1] Kitsap County: A History. (Silverdale, Wa.: Kitsap County Historical Society Book Committee, 1977), I:6-7.

Exploring Expedition, under the command of Lieutenant Charles Wilkes, set sail for a four-year tour. The expedition, which visited the South Pacific and the Antarctic before heading to the North Pacific coast, fulfilled a number of commercial, scientific and diplomatic objectives, but also established American interest in the settlement of the far Northwest. As they explored, Wilkes and his men named land and water features for crew members and noted naval figures. One party spent several weeks in late May 1841 surveying and mapping Admiralty Sound as well as all the bays and coves in that vicinity, while in June another group explored the waterway that became known as Hood Canal. Both Dyes and Sinclair inlets, which frame the small Keyport peninsula, were named for members of the Wilkes party.[2]

Wilkes' expedition initially had greater impact on science than politics, but in the long term, publicity about the voyage led to increased immigration to the West Coast and better information that could be used by the federal government in international negotiations for control of this region. The Civil War distracted attention from further exploration, but in 1867 the government sent a team of Army engineers to Puget Sound. After their survey, they recommended that the military immediately locate naval facilities, including a dry dock, in the area. It was another decade, however, until naval lieutenant Ambrose B. Wyckoff was assigned to the U.S Coast and Geodetic Survey to chart the waters of the Sound. In his three-year tour of duty, he, too, saw the great potential for a naval facility in the region and urged his superiors in Washington, DC, to proceed with land acquisition. A bill for this purpose failed in the 1880 session of Congress, but in 1888 legislators gave the president authority to appoint a commission that would recommend a site north of California for a naval station. Members of the commission selected an area of over 1700 acres between Dyes and Sinclair Inlets, but political pressure eventually reduced the amount of land to 200 acres with the facility to be used solely for a dry dock. The land selected on Port Orchard Bay eventually became the Puget Sound Naval Station with Lieutenant Wyckoff as its first commanding officer. Construction of the dry dock was completed in April 1896, and although further development slowed for a time, after 1900 expansion began again and by 1902 was designated Navy Yard Puget Sound.[3]

The development of more advanced weaponry, and specifically the torpedo, brought increased interest in other Northwest sites for testing and development. In 1909 a naval commission sent to survey along the Pacific coast found the Keyport peninsula to be the

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[2] Viola, Herman, and Carolyn Margolis, eds., Magnificent Voyagers. The U.S. Exploring Expedition, 1838-1842. (Washington, D.C.: Smithsonian Institution, 1985), 9-11; Haskett, Patrick, The Wilkes Expedition in Puget Sound 1841. (Olympia, Wa.: Western Interstate Commission for Higher Education and State Capitol Museum, 1974), 1-2, 27-31; Perry, Fredi, Bremerton and Puget Sound Navy Yard. (Bremerton, Wa.: Perry Publishing, 2002), 8-9; Hitchman, Robert, Place Names of Washington. (Olympia, Wa.: Washington State Historical Society, 1985), 77, 274.

[3] Magnificent Voyagers, 23, 225; Kitsap County, III:3-5, 8-11.

best site for a torpedo station, and in the following year another follow-up crew completed a hydrographic survey of the adjacent waterways that confirmed this view. In the Naval Act of June 24, 1910, Congress appropriated $145,000 for the land purchase and construction of the initial buildings for a Pacific Coast Torpedo Station, although preliminary estimates had placed the cost of land purchase and building construction at nearly double that figure. Local property owners would not accept the offers made by the Navy for their land, and although the government started condemnation procedures, the process was eventually dropped in 1911.[4]

The Navy could not find another suitable site, however, and after Congress re-appropriated the funding for a Pacific torpedo station in August 1912, acquisition of the Keyport peninsula again became a priority. This time the Navy followed through with condemnation procedures when it could not come to a price agreement with some of the owners. The suit was tried in late May and early June of 1913, and the jury awarded the property owners approximately $110,000 for the government's purchase of 220 acres of land, which included at least two miles of tidelands and oyster grounds. Secretary of the Navy Josephus Daniels visited the site in the following month and indicated that as a cost-saving measure, the Navy would only agree to acquire a portion of the condemned land. Naval personnel and members of the Attorney General's office counseled him against this decision, and some local landowners filed another lawsuit. These matters were finally settled in early 1914, when the purchase of 88 acres was completed. The land for the Keyport base was transferred to the government in July of that year.[5]

The Keyport Peninsula had several important advantages for the location of a torpedo station, according to the Bureau of Ordnance:

Hydrographic

a) Absence of strong currents.
b) Excellent bottom for torpedo practice.
c) Excellent depth of water; not too deep to dive in, and yet navigable for vessels of any size.
d) A range of 6,000 yards, or more, can easily be obtained in sheltered water.

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[4] Kitsap County, II:163; G.L. Meyer to Attorney General, Feb. 26, 1913, (National Archives-Pacific Alaska Region (NARA-PAR), RG 181, 13th Naval District, Correspondence, Box 2, File 1583, Folder 2); Estimates for Torpedo Station, Navy Yard, Puget Sound to Secretary of the Navy, July 25, 1913, (NARA-PAR, RG 181, 13th Naval District, Correspondence, Box 2, File 1583, Folder 1); Poole, Lisa, Torpedo Town, U.S.A. (Keyport, Wa.: Diamond Anniversary Publishing, 1989), 5; C.F. Riddell to Ira Bennett, July 21, 1913, (NARA-PAR, RG 181, 13th Naval District, Correspondence, Box 2, File 1583, Folder 2).

[5] Ibid.; F.F. Roosevelt to Commandant, Navy Yard, Oct. 14, 1913, (NARA-PAR, RG 181, 13th Naval District, Box 2, File 1583, Folder 2); Clay Allen to Commandant, Navy Yard, Nov. 25, 1913, (NARA-PAR, RG 181, 13th Naval District, Box 2, File 1583, Folder 1); Torpedo Town, 14, 99.

e) An excellent base for torpedo vessels of all types, and an excellent anchorage for battleships or cruisers while taking on or turning in torpedoes.
f) Clear water, both as to visibility of objects and as to the absence of heavy traffic.
g) Sufficient area to allow both battleships and armored cruisers to fire over fixed ranges near the station.

Topographic

h) Keyport Peninsula is nearly level. The shores are low and yet deep water is to be found very close to the high water line; thus docks and slips will not have to be very long and therefore exceedingly expensive.
i) The torpedo store houses and workshops can adjoin the firing wharf, thus avoiding loss of time in transportation and increased cost in test firing.
j) The shores of Puget Sound are generally precipitous, and before the erection of buildings could be undertaken in nearly every other locality, extensive clearing, leveling and grading would have to be undertaken.
k) There is a good water supply available.
l) Possibility of establishing a good rifle range.
m) A part of the land is cleared of timber.
n) There are but few and inexpensive buildings on the land at present.
o) By purchasing the whole Peninsula, the station can easily be kept under military control and policed and experimental work carried on without observation. Saloons and resorts of ill fame can be kept at a distance.
p) There will be plenty of room for future expansion as well as for development into a torpedo boat base and torpedo school.

Strategic and other Advantages.

q) The station will be but nine miles from the navy yard, Puget Sound. Heavy repair work can thus be undertaken at the larger plant at a saving in time and money, without duplicating in the machine shops.
r) The station is well defended by the Sound forts, being located inside both inner and outer lines of defense.
s) There are two channels leading to the open water of Puget Sound.
t) The station is near a labor market—Seattle and Bremerton.
u) There is a school in the immediate vicinity and a small village where the employees can live.
v) There is good and quick water communication with Seattle. [6]

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[6] Bureau of Ordnance to Navy Department, Second Endorsement, June 30, 1913, (NARA-PAR, RG 181, 13th Naval District, Box 2, File 1583, Keyport Land Acquisition, Folder 1).

Prior to its purchase by the government, land on the peninsula had been logged and was primarily used for farming. The earliest patents on property that became part of the station were issued to John Garrison (73.47 acres) in 1865, John Fryberg (160 acres) in 1866, and then in 1869 to William Benton (438.75 acres) and to Solomon Brown (147 acres) the following year. Some of these claimants may not have actually lived on their parcels, and it was primarily the settlers arriving in the 1880s and 1890s who built homes and barns and began farming as well as raising livestock. Among the long-term early residents were Oscar and Hannah Ekstedt, who had emigrated from Sweden and began homesteading 183 acres in 1883. The Ekstedts planted a garden and raised sheep for meat as well as the wool. Other Scandinavian settlers joined them, including the Halseth, Hanson and Mathson families. Initially residents rowed to Port Madison or Seattle for supplies until regular steamboat service began in the mid- to late 1880s. The first road was constructed between the Keyport Peninsula and Tracytown and another from Keyport to Brownsville was completed in the early 1900s.[7]

According to local pioneer accounts, the name Keyport was chosen for the growing settlement in 1900. Peter Hagen and the Kuppler brothers evidently used an atlas to find a promising name, and Hagen thought Keyport was particularly appropriate because of the little town's position at the entry to Dogfish Bay (later Liberty Bay). Others did not agree, and evidently tore down the new town's sign several times before the name was finally accepted. Settler Andrew Hansen built the community's first general store and post office on the tip of the peninsula in 1903 and leased it to the shopkeeper, Henry Husby. The store also provided a dock for the use of customers and local residents. A Grange hall, built nearby, provided a center for community activities, religious services and social functions.[8]

At least nine individuals or families owned property that was purchased by the Navy in 1914, and adjacent state land was also eventually deeded to the government for the station. The portion that became the first industrial area of the station included 5.5 acres owned by Andrew Hansen and another five purchased from Ole Thompson and his wife. Homes owned by Hagen, Paul Thompson, Alfred Petterson and Henry Busby were retained by the Navy and turned into housing for personnel. The Norum family home became the residence of the new base commander, while the others were used for the quarters of watchmen and warrant officers. The Navy also refitted the Grange hall and store for use as a barracks by enlisted personnel. Admiral V.L. Cottman, who was the commander of Naval Yard, Puget Sound, was initially in charge of the new torpedo station, and he allowed previous residents to stay until November 1 so that they could

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[7] Bureau of Land Management, General Land Office Records, Land Patent Search, http://www.glorecords.blm.gov/PatentSearch/ (accessed June 1, 2007); Kitsap County, II:164-165.
[8] Torpedo Town, 5-7.

harvest their crops. The first regular base commander, Lieutenant Commander Henry Jenson, was commissioned in November 1915.[9]

2. World War I-Era Development

Since the days of the Spanish American War, the number of United States warships in the Pacific had increased rapidly. Many carried torpedoes, which were then a very new underwater weapon. The only facilities available to maintain and overhaul these torpedoes were on the East Coast, however, so the Navy began to search for a suitable site along the Pacific. When Keyport was chosen as the new location for a maintenance facility and tracking range, most torpedoes were designed to search out their targets in shallow water. The purpose of the range facility was to test these weapons in a realistic, yet controlled, environment, assess their performance, and uncover and fix any problems. As the nation moved closer to involvement in World War I, the need for this proofing and testing became increasingly pressing.[10]

Once the Navy secured the land at Keyport for a station, initial plans were to undertake minimal improvements that would make the facility operational as quickly and economically as possible. In addition to repairs and refitting of the structures already on the site, the Navy also began to install lighting, water and sewage systems as well as electrical service in the summer of 1915. A 40-foot steam cutter was assigned to the station to carry supplies, and plans were made to improve communication by extending telephone lines from the Navy Yard via Manette to the Keyport Station.[11]

The first permanent building constructed on the new site was Building 1, which initially housed all administrative functions of the base, and also included a storehouse, a torpedo overhaul facility, a machine shop as well as space for carpentry, electrical and pipe workers. The size and design of Building 1 allowed for virtually all of the station's activities to be housed together, but its configuration also provided sufficient length and height for the steam torpedoes of that era to be hauled in, disassembled, tested and then reassembled for proofing. The building was constructed at the end of the peninsula close to the waterfront so that the torpedoes could be easily transported to the bay for range testing. A torpedo dock, which became known as Pier 1, was also built in 1915. Building 11, a target shed, was also added to the complex during this first year of operation.[12]

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[9] Torpedo Town, 6-11, 14; D.W. Blamer to Sec. of Navy, Sept. 11, 1914 (NARA-PAR, RG 181, 13th Naval District, Box 2, File 1583).

[10] Gundersen, Charles, The History of the Naval Torpedo Tracking Ranges at Keyport. (Keyport, Wa.: NUWC, Test and Training Environments Department, 1998), 1.

[11] Officer in Charge to Bureau of Ordnance, July 28, 1915, (NARA-PAR, RG 181, 13th Naval District, Box 2, File 1583); R.E. Coontz to County Commissioners, Oct. 26, 1915, (NARA-PAR, RG 181, 13th Naval District, Box 2, File 1583, Land Acquisition Keyport).

[12] Bureau of Ordnance to Navy Yard, Puget Sound, July 22, 1914, (NARA-PAR, RG 181, 13th Naval District Box 2, File 1583); Officer in Charge to Bureau of Ordnance, July 28, 1915, (NARA-PAR, RG 181, 13th Naval District, Box 2, File 1583 Land Acquisition).

The earliest torpedoes tested at Keyport were made by the Whitehead Company of Woolrich, England. A number of these steamfish, as they were familiarly called, were initially brought to the station from warships being overhauled at the Puget Sound Naval Shipyard. These torpedoes underwent some very basic testing procedures on the original range, which was roughly laid out in Port Orchard Bay, possibly as early as 1913, according to some sources. In April 1916, the first major shipment of new torpedoes arrived at the station. They were stored on one side of Building Number 1 and then moved by a crew of three or four men across the floor, where they were broken down and overhauled before being reassembled. Once ready, they were loaded onto handcarts and pushed out to the torpedo dock. During 1915 and 1916, the *USS Lawrence*, a destroyer, was used as a firing vessel. The ship provided compressed air and power to propel the torpedoes down the range until the power plant was operational in 1916.[13]

By the spring of 1916 the Navy had also built a radio station and erected two 400-foot towers to improve communications. For these construction projects, Keyport's work force had risen to 50 men, who built and maintained the radio station and also helped to lay out the new testing range. A detail of Marines had arrived earlier in the year and they remained as a guard unit, initially living in tents at the station. The entire perimeter was fenced during this period and sentry points established to protect the station.[14]

American entry into World War I had required mobilization of United States forces, but the direct impact on Keyport was relatively limited. The number of enlisted personnel at the station rose to approximately 65 by the end of the war, including its first four women or "yeomanettes," as they were occasionally called. A torpedo school was started in 1920, and additional military servicemen came to the station from all over the country for three months of instruction in diving as well as torpedo handling and ranging. Approximately 80 full-time civilian employees also worked at Keyport by 1920, and this number did not change substantially for another 17 years. This group included the first civilian woman employee, who was placed in charge of the storeroom.[15]

During the war years, a number of additional building projects were initiated. As the testing capacity of the station increased, Building 12 was constructed for torpedo storage and many of the torpedoes initially stored in Building 1 were brought to the new building, allowing additional space for work benches in Building 1. The power station, which also became part of Building 1, was completed in 1917 and by the following year was equipped with an air compressor and several small generators and boilers. Sitting atop the power plant was a bell, which was rung to signify the start of the workday or to notify people on the base of an emergency. In 1918, several more new buildings were added,

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[13] History of U.S. Naval Torpedo Station, Keyport, Washington, 3-5.
[14] Ibid., 5-6.
[15] Ibid., 7, 12.

including Building 38, which was used as a torpedo storehouse, and Building 15, which became a lumber storage facility. Other additions include a target shed in Building 13, a machine shop in Building 23, and an igniter plant, which was located in Building 24. Building 47, which included storage and supplies as well as the plating plant, was built in 1919.[16]

Slowly the infrastructure of the station was also improved. Access to fresh water was essential, and the Navy drilled its own wells in 1918 and 1919 and built two large above-ground water storage units. At the same time a fire protection system that utilized salt water was completed. Underground fuel lines and a tank were also installed as well as overhead power lines to the torpedo dock. New roads were built to connect the main parts of the station, although water transport remained the primary means of bringing in goods from Bremerton and other outside areas. The first private automobiles were not allowed on the base until 1922, when the first parking lots were constructed. A narrow-gauge railroad ran from Building 1 to Pier 1, and later was extended to the freight dock, also called Pier 2, when that structure was completed in the fall of 1919. Electric cars powered by batteries ran on the tracks. A steam-powered engine was also used for hauling, but when sparks caused too many grass fires on the station, it was replaced with an air-driven locomotive. A generator and switchboard were added to the north end of Building 1 to provide additional power for the rail system.[17]

3. Inter-War Years

The basic function of the station during the 1920s and 1930s was proofing torpedoes, and generally the methods used did not change significantly throughout this period. The types of torpedoes initially proofed were the MK 7, which was the Navy's first steam torpedo, and then the MK8, MK9 and MK10. The MK8 was a large torpedo, 21 inches in diameter and 21 feet in length, which was launched from a destroyer, while the MK9 was launched from a battleship. The MK10 was a speedy, short-range torpedo with a large warhead.[18]

The goal of the proofing process was to allow the torpedoes to complete a 7000-yard test run down the range at an optimum speed to ensure that the torpedo would make a straight run for this distance. The range, established in Port Orchard Inlet in August 1916 and used for most of the inter-war era, extended from Pier 1 southward into Port Orchard Bay. All testing was done from torpedo tubes mounted on a firing float. Observers watched the torpedoes as they made their way down a course marked by buoys, which provided a general reference line as well as mid- and end-point markers. There was no underwater tracking equipment during this period, and experts made visual observation of a torpedo's course. Communication between the Torpedo Dock and firing floats was

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[16] Ibid., 7-10.
[17] Ibid., 7-10, 14.
[18] The History of the Naval Torpedo Tracking Ranges at Keyport, 5.

originally conducted with flags, which were replaced by a field telephone system along underwater submarine cable in 1919. This system remained in use until field radios were purchased in the late 1930s. The area was shallow enough that divers could locate the torpedoes after the runs, and then they could be brought up and returned to the station for final storage and shipment to naval vessels.[19]

To support this testing program, a number of new buildings and other structures were added to the station during this period (see Table I). Most of the facilities that had manufacturing or support functions were located along or near the waterfront, with the greatest concentration in the main industrial area on the eastern side of the station. In the 1930s three buildings, in particular, including the Plating Plant (72), the Machine Shop (73) and the Dispensary (74), were added to the heart of this industrial district. By this time the mission of the station not only included overhaul and maintenance of the torpedoes, but also some modification and testing as well as igniter assembly. Table 2 illustrates the torpedo programs that were undertaken during this period. In 1937 base personnel were also given the authority to manufacture small torpedo parts, including those for the igniters.[20]

Table 1. Construction of Industrial Buildings and Structures: 1920-1937*

DATE	BUILDING**	USE
1920	Building #37	Transportation Garage
	Building #39	Storage
	Building #46	Garage
1921	Building #36	Warhead Storage
	Building # 40	Pipe Shop and Storage
	Radio Tower	400' Tower
1922	Building 48	Boat Engine Maintenance
1923	Building #140	Spud Locker, Laundry, Office, Boiler Room, Ice Plant
1924	Building #57a	Igniter Plant
	Building #57b	Stowage
1925	Building #68	Garage
	Building #78	Incinerator Building
1926	Building #64	Addition for Fresh-water Pump House
1930	Building #71	Housing for Electric Warhead Trucks
1931	Buildings #190-197	Torpedo Storage Buildings
1934	Building #74	Dispensary
1935	Building #67	Acid Storage Building
1936	Building #72	Plating Plant
	Building # 73	Machine Shop
	Building #77	Lumber Storage
	Freight Wharf/Pier	Structure Overhauled and Extended
1937	Building #76	Fire Station, Guard House next to Main Gate

* Buildings and structures constructed for industrial uses and support functions, 1920-1937, based on information from annual Command Histories.[21]

** New barracks and housing are omitted from this table.

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[19] The History of the Naval Torpedo Tracking Ranges at Keyport, 5; History of U.S. Naval Torpedo Station, Keyport, Washington, 22-23.

[20] Ibid., 19-20, 23.

[21] Ibid., 1-23.

Table 2. Pre-World War II Torpedo Work at the Naval Torpedo Station, Keyport[22]

DATE	TORPEDO TYPE
1920	Mark 8 and 9-1
1928	Conversion of Mark 83-C torpedoes to Mark 83-D
1931	Mark 10, 7, 8 overhauled and proofed
1937	Mark 7-2a, 28, 4a, 5 Mark 8, 8-1, -2, -2a, -2b, -3a, -3b, -3d, -4b Mark 9-1, -3 Mark 10 Mark 11
1937	Mark 12

During the Depression years, a number of employees at the station were hired under various employment and recovery programs, including the Emergency Relief Agency (ERA), the Civilian Conservation Corps (CCC), and the Works Progress Administration (WPA). These crews were primarily involved in cleanup and general improvement projects. The major tasks for the CCC workers, in particular, were to clear most of the remaining forested land on the station, and grade, level, and landscape these areas. Other crews built new patrol roads throughout the base. By the latter part of the 1930s, there were significantly more relief workers than permanent employees at Keyport.[23]

While the mission at Keyport was primarily proofing and testing, virtually all of the torpedo production by the Navy took place at Newport, Rhode Island. This concentration of efforts had already caused some problems, as this facility could not produce a sufficient number of torpedoes to meet training and testing requirements. In addition, there was a reluctance to test many of these torpedoes because of the high cost of producing the newest of these weapons, which was the MK14 steam torpedo with an MK6 magnetic influence exploder. These innovative torpedoes enabled naval personnel to target the keel of an enemy vessel, and the explosion would usually cause the boat to sink. The limited nature of the testing schedule would have disastrous consequences in World War II.[24]

4. World War II Era

By the time World War II loomed on the horizon, the naval station at Keyport had undergone some major changes. In 1929 the Navy acquired an additional 61 acres to expand the size of the station. Personnel helped to clear this land, a portion of which was to be used for warhead storage. In the following year, since its functions had increased, the station name was changed from the Pacific Coast Torpedo Station to the U.S. Naval Torpedo Station. By the late 1930s, however, the Port Orchard Inlet firing range had become too shallow for many of the new torpedoes that were undergoing proofing and testing. Dredging the area was one option under consideration, as was the development

[22] Ibid., 12, 18, 19, 21.
[23] Ibid., 23-24.
[24] The History of the Naval Torpedo Tracking Ranges at Keyport, 6-7.

of new range sites around Puget Sound, although the water depth could not be too great for torpedo recovery efforts.[25]

It was not these issues, however, but the high failure rate of the MK14 torpedoes that caused a huge expansion of the testing program at Keyport during the war years. The development of torpedoes that could reach their targets accurately and effectively became an important goal of World War II research and testing. According to author Robert Gannon:

> Torpedoes available at the beginning of World War II had been badly designed, inadequately tested, poorly calibrated. They missed the target, or, somehow worse, failed to explode when they did hit. The fault lay with the designers, with the Navy, with simply the way things were done. Torpedoes at the end of the war were trustworthy and they were accurate. Those responsible for the transition included industrial engineers, submarine skippers, and Navy bureaucrats. They also included academics...Such mismatched groups became prime players in history's first global, technological chess match, the world's first war of physicists—and for those involved it was extraordinarily exciting."[26]

Part of this excitement played out at the Keyport station. The Navy's apparent dissatisfaction with poor engineering and inadequate testing procedures for the Mark14 torpedo at the Navy's Newport, Rhode Island, facility led to an increasing reliance on Keyport. The President of the United States, Franklin Roosevelt, ordered torpedo testing and proofing to be increased as quickly as possible. Civilian employment at Keyport grew from 92 civilian workers in 1937 to a high of over 2000 in 1944, in addition to as many as 800 military personnel. The industrial district was expanded quickly to meet the demands of the new testing program, as the Navy tried to ensure that all torpedoes had been successfully fired before they were issued to the Fleet. This new emphasis led to the development of more sophisticated testing techniques and tracking technology by the end of the war years.[27]

5. Industrial District Development

During the World War II era, a huge surge in new construction took place at Keyport. Beginning in 1940 when a number of public works projects were initiated, including the installation of a cement mixing plant and the paving of roads, the station prepared for its expanding role in the war effort. In 1942 Building 80, the igniter plant, was added to the

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[25] History of U.S. Naval Torpedo Station, Keyport, Washington, 18, 19.

[26] Gannon, Robert, Hellions of the Deep: The Development of American Torpedoes in World War II. (University Park, Penn.: Pennsylvania State University, 1996), xiii-xiv.

[27] Historical Brochure, Naval Torpedo Station Keyport, (Keyport, Wa.: Naval Undersea Museum, Box ARO 203 CO!A, Folder 2006.057.003, 1957), 9; The History of the Naval Torpedo Tracking Ranges at Keyport, 7-8; History of U.S. Naval Torpedo Station, Keyport, Washington, 25.

industrial area as was Building 81, which included the exploder shop and annex. Additional fuel storage and a new garbage depot were also built during the year.[28]

In 1942 and 1943, however, new construction reached its peak. In 1942 alone, at least 23 new buildings and structures were erected at the Keyport station in addition to a number of igloos, which were the dome-like structures used at the base for torpedo storage. Among the major new buildings were a new torpedo shop and administration building (Building 82), public works shops (Building 83), a foundry (Building 84) and a blacksmith and pipe shop (Building 85). A number of sheds and storage units were also built and another deep-water well dug. In 1943, additional storage facilities for paint, oil, and gas were erected. Another major building near the waterfront, Building 98, was also constructed for torpedo shops at this time.[29]

Other improvements included the protection of torpedo tubes used for launching exercise torpedoes on the south end of Pier I. Since there was no shelter to cover the tubes or the men who loaded them, Building 99 was constructed in 1943. It contained three areas for launching torpedoes of various sizes, and the tubes were on rotating mounts, which could swing out through large sliding doors to allow the tubes to be pointed downrange. Many of the nearly 7000 torpedoes proofed in 1944 were launched from Building 99 with others fired from a floating barge. On the south side of the building an underwater elevator and submersible torpedo tube were constructed, and in mid-1944 a range control center was added at the top of the building.[30]

In addition to the construction needed for the increased torpedo testing work, the war also caused other changes in the administration and protection of the station. Since rationing was in effect, it was often difficult to locate materials needed for all the ongoing construction projects, and the Navy enacted strict conservation rules. The main supply department, which had long been centralized at the Naval Shipyard, continued to locate most materials, but by 1943 Keyport was given its own purchasing division to source smaller purchases.[31]

For security purposes, the public had not been allowed to visit the base since 1939. After Pearl Harbor, increased protection of the base by the Marines included the use of what were called "war dogs" to patrol the fence line. Barrage-balloon stations were established at strategic locations outside of the station, and anti-aircraft emplacements were built on Buildings 82 and 76 as well as additional locations around the base. Helen Hill, whose father worked in the power plant, remembers a gun emplacement in the front yard of their family home. The soldiers who manned it became good friends of her

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[28] Ibid., 25-26.
[29] Ibid., 27-29.
[30] The History of the Naval Torpedo Tracking Ranges at Keyport, 14.
[31] History of U.S. Naval Torpedo Station, Keyport, Washington, 27-28.

mother, who brought them food during their duty time. Personnel who worked in the shops also remembered blackout curtains around the doors of the building and other precautions for wartime safety.[32]

Increased personnel were needed to carry out all of these functions as well as to fill all the new testing and support functions at the station. As early as 1941, Keyport had begun running 24 hours per day, and employees were asked to work seven-day weeks with the eighth day off. During the early war years these employees were hired through the Puget Sound Naval Shipyard, but by 1943 the numbers needed were so great that a personnel office headed by a military officer was established at Keyport. Initially, many who worked in the shops were part of an apprenticeship program that trained them for work as machinists, toolmakers or other technical positions. The requirements for this course, which was normally a four-year program, were compressed into a two-year period. The number of female employees also grew steadily. Initially they were placed in administrative and support positions, but by 1942 they also began to fill a large number of jobs in the industrial shops. By 1944 at least 42 percent of the entire workforce at Keyport was women.[33]

Housing for all of these workers was difficult, and many had to live in make-shift shelters until better arrangements could be made. Some like Doran Kennedy, who was in the apprentice program, lived in tents with their families, while a few others lived in their cars. In 1941 a new defense housing project in Poulsbo provided 300 units of new housing and more were finished by 1943. A small ferry brought workers from the Poulsbo area to the base, while many others commuted from Bremerton and other towns, where new defense housing projects like Westpark and Eastpark were rapidly being built. Additional housing was also provided when the Navy acquired over 61 additional acres of land that lay to the southwest of the station. The purchase, which was completed in 1943, included ten small homes and farmhouses that the Navy converted into quarters for station personnel.[34]

As the World War II slowly came to a close, it also ended this third important period of growth at Keyport. During the war years, station employees had assembled over 2000 steam torpedoes and proofed an average of 7000 per year. This work had required a rapid expansion of the industrial area of Keyport as well as the construction of housing and other necessary infrastructure. Employment had reached a peak of 2035 civilian personnel and 821 military over this period, but these numbers began to rapidly decline

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[32] Ibid., 24, 25-28; Hill, Helen, interview April 27, 2007; Davies, Floyd, interview May 11, 2007.
[33] History of U.S. Naval Torpedo Station, Keyport, Washington, 26-30; Davies 2007; Kennedy, Doran, interview March 29 and April 27, 2007.
[34] History of U.S. Naval Torpedo Station, Keyport, Washington, 26-28; Kennedy 2007; Plum, Mary Ellen, interview April 13, 2007.

after August of 1945. By the end of 1946, the civilian workforce had already dropped to approximately 275 and appropriations were also cut drastically.[35]

The innovations developed during the war years helped Keyport maintain its status despite the rapid cutbacks. The Acoustic Tracking Range, which was installed during the summer and early fall of 1944, provided a more sophisticated means of tracking the depth and speed of torpedoes than the older visual method. Although maintenance of the range was deferred during the postwar years, by 1951 it was restored to normal operations and was an important element of the testing program. Another wartime development was the working relationship between the Keyport station and the Applied Physics Laboratory (APL) at the University of Washington, which led to innovations like a more reliable torpedo exploder as well as new underwater weapons and tracking systems. The development of the 3-Dimensional Tracking Range at Dabob Bay, which was installed in the late 1950s, was among these new technologies developed in conjunction with APL.[36]

PART II. SOURCES OF INFORMATION

A. Interviews

Floyd Davies, May 11, 2007, Hansville, Washington. Interviewed by Sharon Boswell.
Helen Hill, April 27, 2007, Kingston, Washington. Interviewed by Sharon Boswell,
Pete Horish, April 18, 2007, Poulsbo, Washington. Interviewed by Sharon Boswell.
Doran Kennedy, March 29, 2007, Keyport, Washington. Interviewed by Sharon Boswell.
Doran Kennedy, April 27, 2007, Keyport, Washington. Interviewed by Sharon Boswell.
Bob Lichtenberg, May 7, 2007, Poulsbo, Washington. Interviewed by Sharon Boswell.
Earl Otto. March 20, 2007, Bremerton, Washington. Interviewed by Sharon Boswell.
Earl Otto, March 29, 2007, Bremerton, Washington. Interviewed by Sharon Boswell
Earl Otto, April 15, 2007, Bremerton, Washington. Interviewed by Sharon Boswell.
Mary Ellen Plum, April 13, 2007, Poulsbo, Washington. Interviewed by Sharon Boswell.

B. Bibliography

1. Primary and unpublished sources:

Bureau of Land Management. General Land Office Records, Land Patent Search. http://www.glorecords.blm.gov/PatentSearch/ (accessed June 1, 2007).

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[35] History of U.S. Naval Torpedo Station, Keyport, Washington, 30, 33.
[36] Ibid., 31-32.

Historical brochure, Naval Torpedo Station Keyport, Washington (Naval Undersea Museum Archives, Box ARO 203 CO!A, Folder 2006.057.003).

Thirteenth Naval District Records (National Archives and Records Administration—Pacific Alaska Region, Seattle unless otherwise noted) RG 181, Correspondence, Box 2.

2. Secondary and published sources:

Carpinella, A. History of U.S. Naval Torpedo Station, Keyport, Washington. Keyport, WA. Compilation of Command Histories, 1915-1959.

Gannon, Robert. Hellions of the Deep: The Development of American Torpedoes in World War II. University Park, PA.: Pennsylvania State University, 1996.

Gundersen, Charles. The History of the Naval Torpedo Tracking Ranges at Keyport. Keyport, WA: NUWC, Test and Training Environments Department, 1998.

Haskett, Patrick. The Wilkes Expedition in Puget Sound 1841. Olympia, Wa.: Western Interstate Commission for Higher Education and State Capitol Museum, 1974.

Hitchman, Robert. Place Names of Washington. Olympia, Wa.: Washington State Historical Society, 1985.

Kitsap County Historical Society Book Committee. Kitsap County: A History. Silverdale, Wa.: Kitsap County Historical Society, Silverdale, 1977.

Perry, Fredi. Bremerton and Puget Sound Navy Yard. Bremerton, Wa.: Perry Publishing, 2002.

Poole, Lisa. Torpedo Town, U.S.A. Keyport, Wa.: Diamond Anniversary Publishing, 1989.

Viola, Herman, and Carolyn Margolis, eds. Magnificent Voyagers. The U.S. Exploring Expedition, 1838-1842. Washington DC: Smithsonian Institution, 1985.

PART III. PROJECT INFORMATION

This documentation was prepared as part of the mitigation for the redevelopment of the Pacific Coast Torpedo Station, Keyport Industrial District, which is within the Naval Undersea Warfare Center Division, Keyport. The project was funded by the United States Department of the Navy. Historian Sharon A. Boswell prepared the historic context and Lorelea Hudson, historic preservation specialist, and Eileen Heideman, architectural historian, compiled the individual building narratives. All three are on the staff of Northwest Archaeological Associates, Inc., Seattle. Building descriptions relied primarily on previous work by historian David W. Harvey. Maps, plans, and historical and large-format photographs were provided by the Naval Undersea Warfare Center Division, Keyport, Washington.

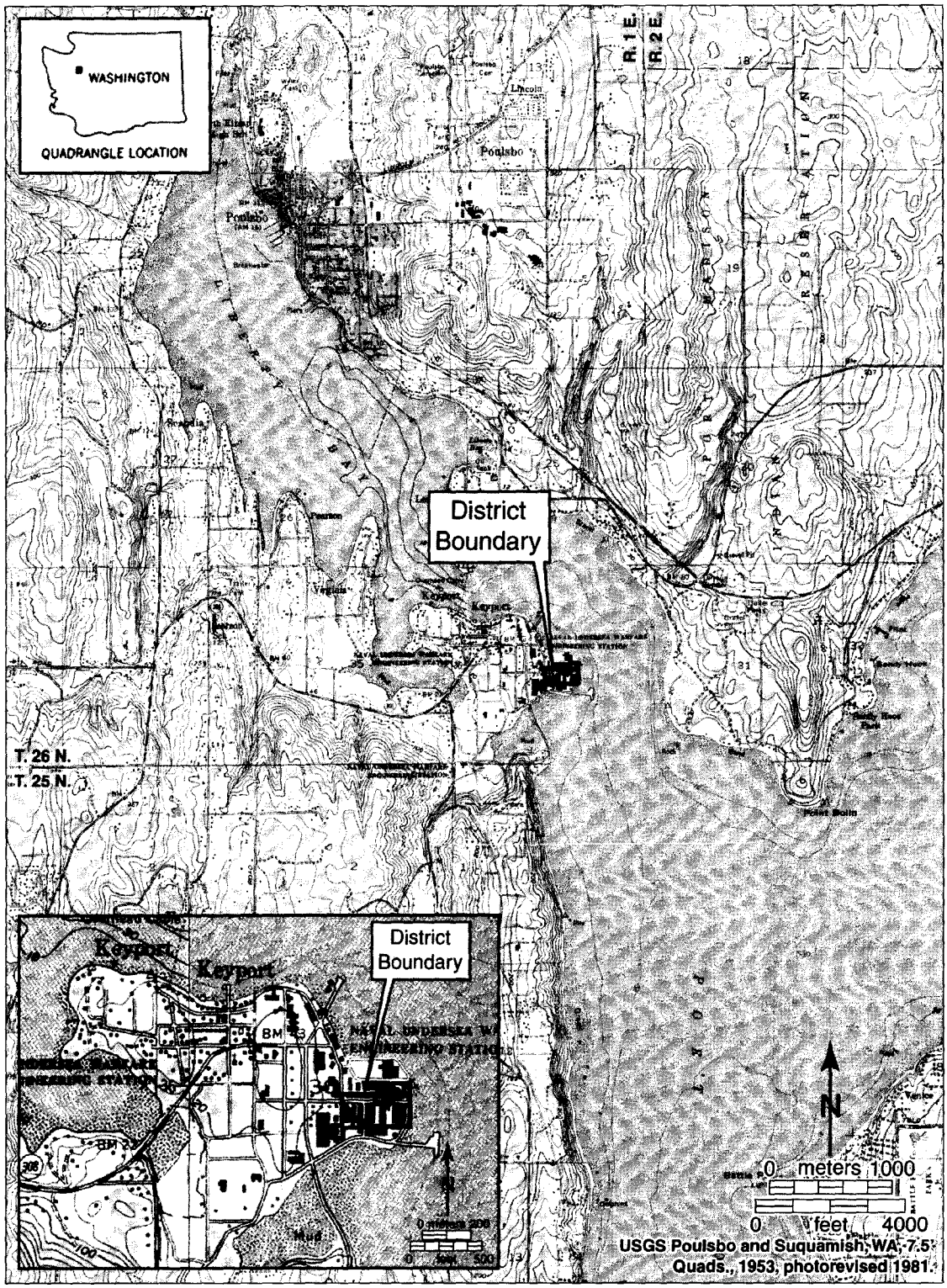

Figure 1. Pacific Coast Torpedo Station, Keyport Industrial District location.

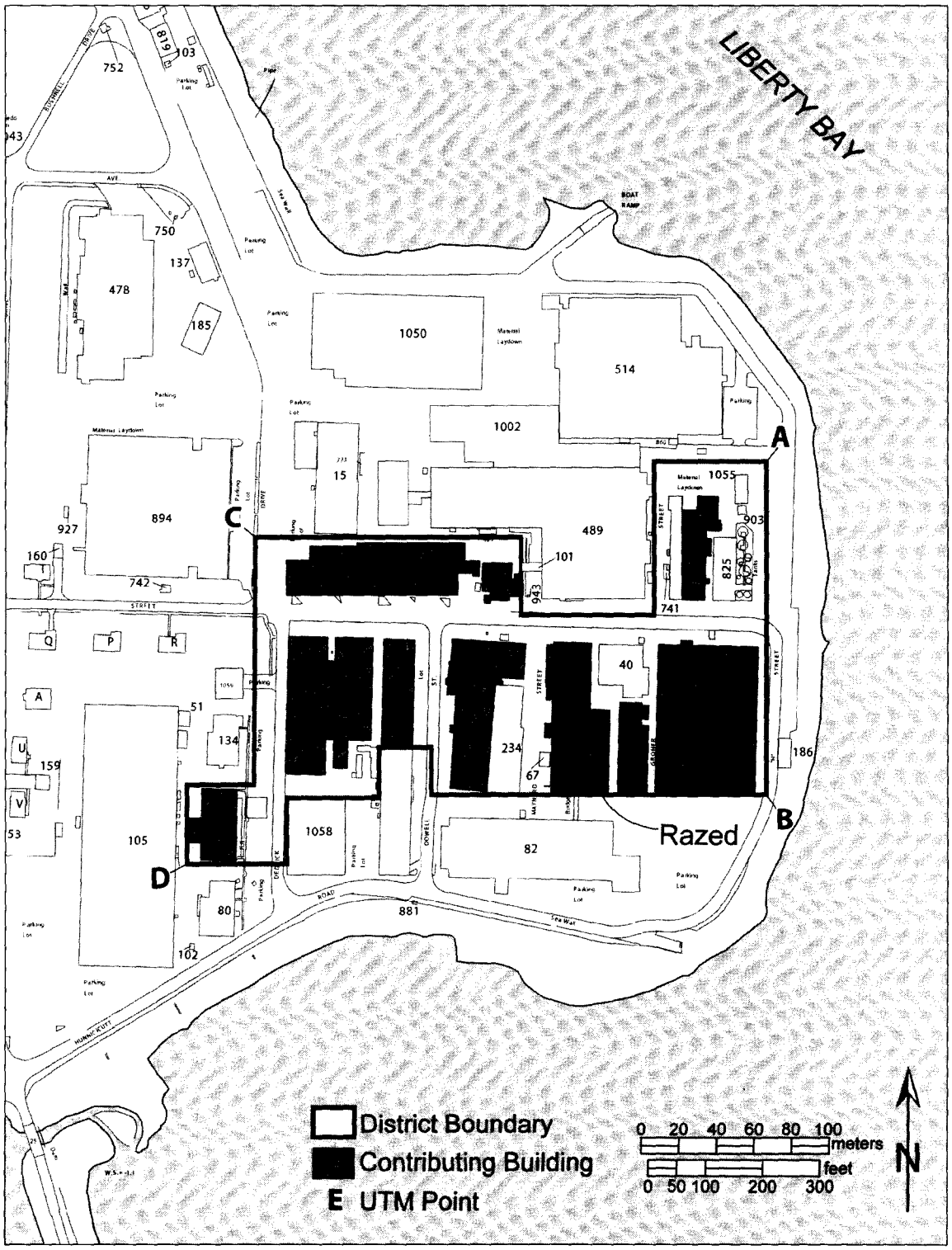

Figure 2. Pacific Coast Torpedo Station, Keyport Industrial District.

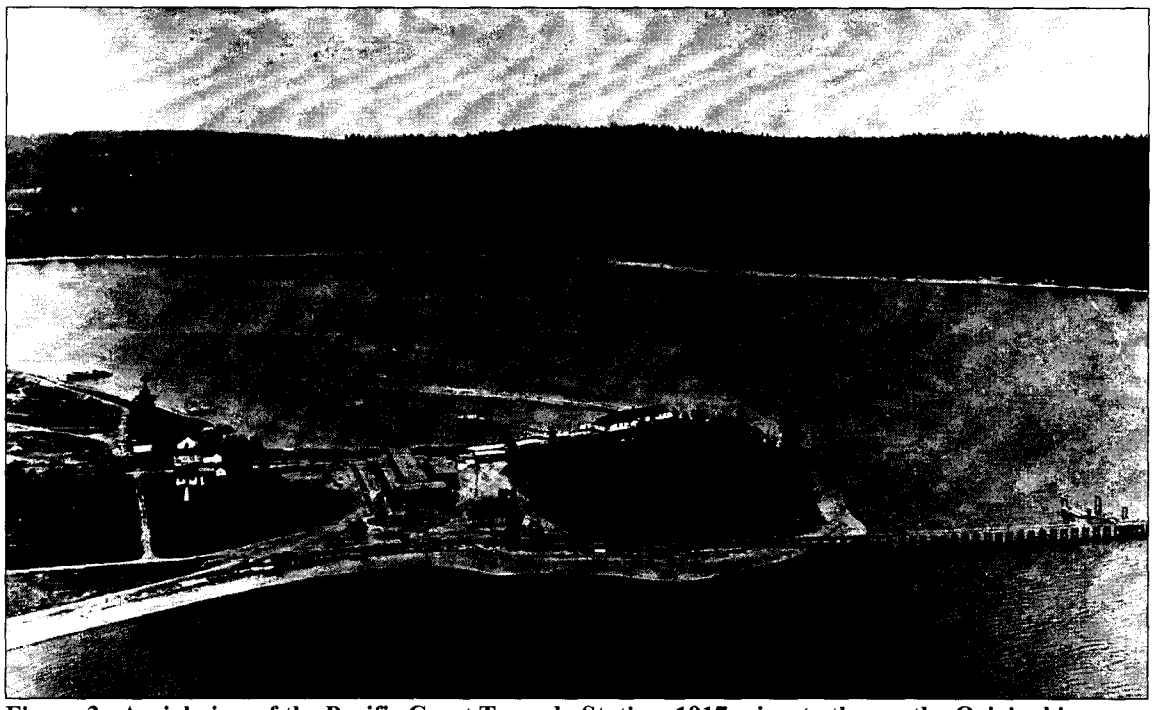

Figure 3. Aerial view of the Pacific Coast Torpedo Station, 1917; view to the north. Original image located at Command Staff Code OOTMA, Naval Undersea Warfare Center Division, Keyport, Washington.

Figure 4. Overview of Pacific Coast Torpedo Station in November 1947; view to the southeast. Original image located at Command Staff Code OOTMA, Naval Undersea Warfare Center Division, Keyport, Washington.

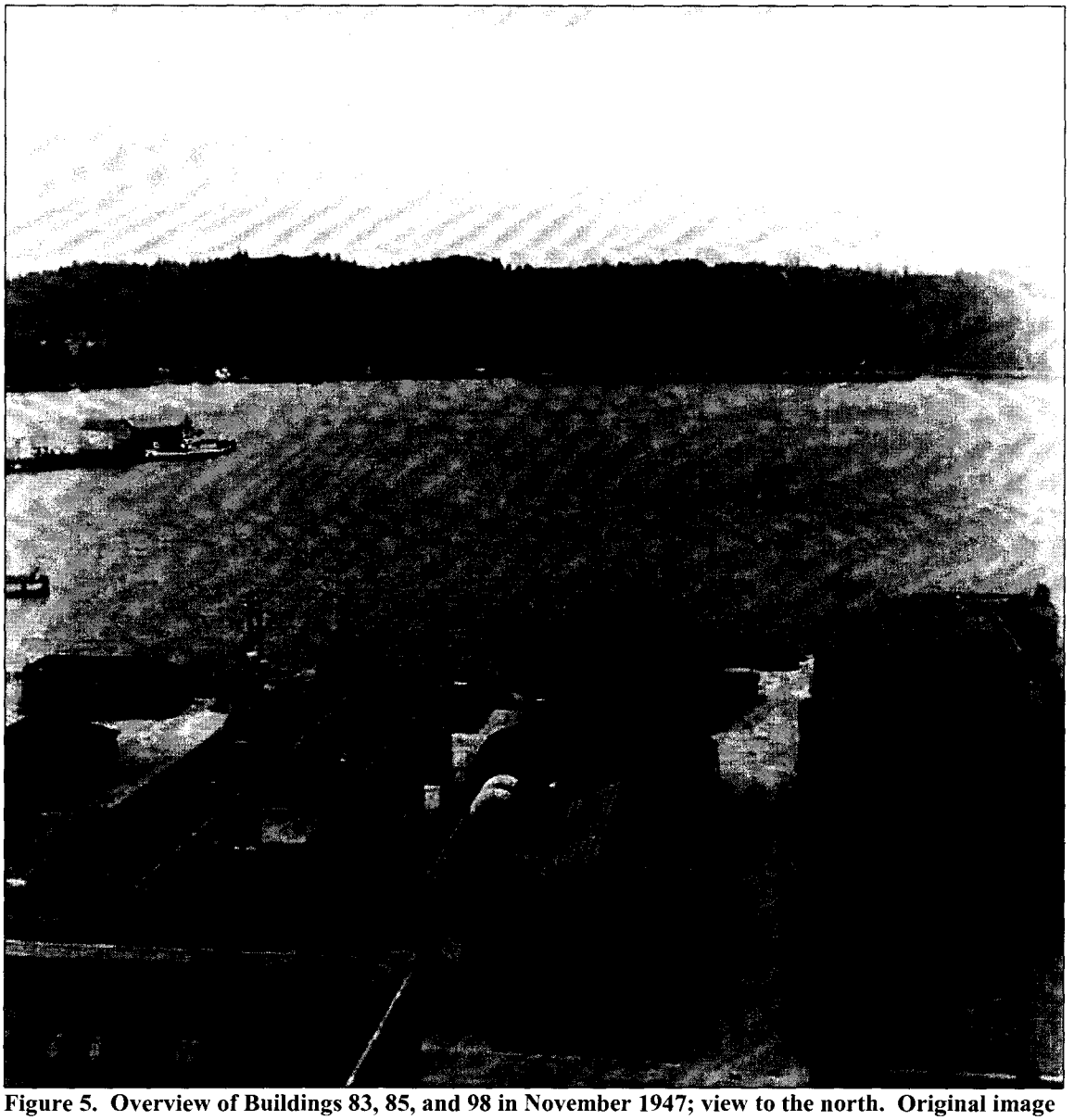

Figure 5. Overview of Buildings 83, 85, and 98 in November 1947; view to the north. Original image located at Command Staff Code OOTMA, Naval Undersea Warfare Center Division, Keyport, Washington.

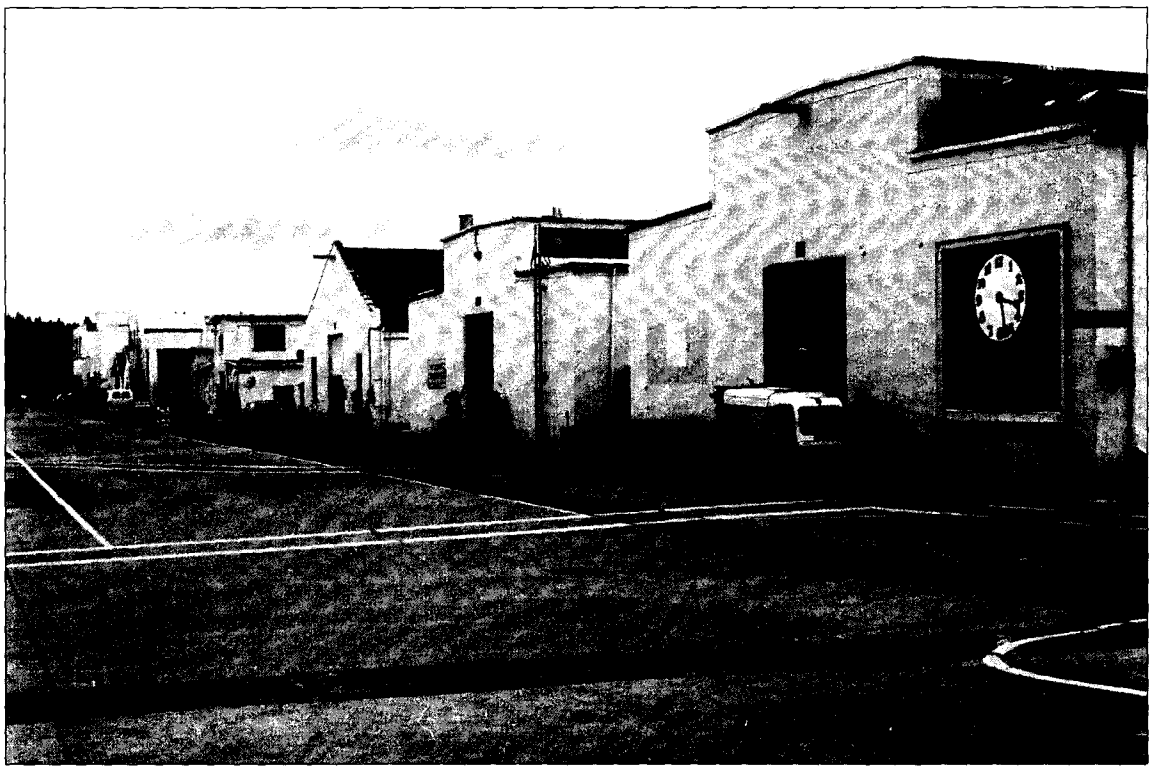

Figure 6. Second Street in 1986, showing Buildings 38, 233, and 12 (right to left) in the foreground; view to the southeast. Original image located at Command Staff Code OOTMA, Naval Undersea Warfare Center Division, Keyport, Washington.

Figure 7. Second Street in 1986 showing Building 73 at left; view to the northeast. Original image located at Command Staff Code OOTMA, Naval Undersea Warfare Center Division, Keyport, Washington.

Figure 8. Overview of Pacific Coast Torpedo Station in March 1989; view to the northwest. Original image located at Command Staff Code OOTMA, Naval Undersea Warfare Center Division, Keyport, Washington.