

Nome Harbor

Condition of Improvements
31 December 2022
Nome Harbor, Alaska
(CWIS No. 010422, 012270, 072742, 087755)

Authorization (1) Rivers and Harbors Act, 8 August 1917 (House Doc. 1932, 64th Congress, 2nd Session) as adopted by Public Law No. 37 to complete the improvement to Nome Harbor, provides for east and west jetties, a channel 75 feet wide to a depth of -8 feet MLLW from Norton Sound through the Snake River, ending in a basin of the same depth 250 feet wide and 200 feet long near the mouth of Bourbon and Dry Creeks, and revetment along the banks of the river. (2) Rivers and Harbors Act, 30 August 1935 (House Doc. 404, 71st Congress, 2nd Session and the Rivers and Harbors Committee Doc. 38, 73rd Congress, 2nd Session) as adopted, provides for the extension of the east jetty an additional 616 feet, the extension of the west jetty another 216 feet, and the extension of the basin northward some 400 feet. (3) Water Resources Development Act of 1999, Public Law 106-53, 106th Congress, Section 101 (a) (1), in accordance with the Report of the Chief of Engineers dated 8 June 1999 and amended on 2 August 1999 provides for a new entrance to Nome Harbor consisting of a 2,986 foot-long breakwater, 230 foot long causeway spur breakwater, and a 3,450 foot long entrance channel with supporting sediment traps and a causeway bridge.

Table 1

Existing Project	Length (ft.)	Width (ft.)	Depth (ft.)
Main Breakwater	3025		
Causeway Spur Breakwater	270		
Entrance Channel	3760	Varies	-10,-12,-22
Basin	600	250	-8
West Sediment Trap (not maintained)	Varies	Varies	-8
East Sediment Trap	Varies	Varies	-22
Causeway Bridge	128	30	
South Sheet Pile Wall	966		
East Sheet Pile Wall	695		
West Rock Revetment	1025		
East Rock Revetment	940		

Project Usage Ocean-going cargo and freight are lightered to and from shore through the Federal project. The basin is used for mooring various shallow draft craft, lighterage vessels, and for subsistence and commercial fishing boats. Nome serves as a center of transportation, general business, supply, and cargo distribution for the Seward Peninsula. All transportation to the area is by sea or air.

Progress of Work

1919	Construction on the original project begins.
1922	Dredging of the channel and the original 200 by 250 foot basin is completed.
1923	The original 335 and 460 foot timber and concrete jetties, and the revetments are completed.
1924	Annual maintenance dredging begins.
1933	Annual maintenance dredging through this year removes an average of 6,500 cubic yards from the turning basin and entrance channel each year.
1934	The Corps procured a small clamshell dredge, the Arctic, along with two scows and a tugboat to conduct the annual maintenance dredging. The government-owned plant and hired labor remove an annual average of 17,000 cubic yards of material each year and conduct seasonal repairs to the jetties and riverbank revetment.
1939	Reconstruction of both jetties with concrete and steel begins.
1940	The jetty reconstruction is completed to modified lengths of 240 and 400 feet.
1945	A severe storm in October destroyed 200 feet of the north revetment and badly damaged 130 feet of the south revetment.
1949	Construction of the 400 foot extension to the turning basin begins. Records indicate annual maintenance dredging. Construction of the Nome seawall also begins under a 3-year continuing contract.
1950	Extension of the turning basin to 600 feet in length is effectively completed, except for small areas in the northerly portion and around the Corps' marine way.
1951	Construction of the Nome seawall is completed.
1952	The timber revetment is restored and resurfaced with sheet steel piling.
1954	At the close of FY54, repair of the east jetty was completed, 18,800 cubic yards were removed from the project, and re-facing the timber revetment with sheet steel piling was concluded.
1964	Contract is awarded for the repair of both jetties in July. A clamshell dredge, the Gilpin, along with two hopper barges and a tugboat are procured to replace the existing government-owned plant.
1965	Repair to the jetties is completed in October. Extensions to the jetties are reported as "inactive."
1978	Maintenance of the revetments, jetties, and dredging is carried out by Government plant and hired labor through this fiscal year.

Progress of Work

1979	Maintenance dredging by contract accounts for the removal of 13,000 cubic yards during the ice-free season.
1982	The east jetty incurs damage in the spring of 1982; the last 40 feet is detached from the remainder of the structure.
1986	Interim repairs are effected on the sheet pile wall in the entrance channel, September-October.
1989	Sampling and testing is conducted; annual maintenance dredging is halted for three years due to environmental concerns and is not resumed until FY92.
1997	The Corps' warehouse and marine way immediately to the west of the turning basin are transferred to the City of Nome.
2000	Annual maintenance dredging removes 3,300 cubic yards from the entrance channel.
2001	Maintenance dredging removes 5,000 cubic yards from the entrance channel in June. Emergency dredging at the end of July and first week of August removes an additional 3,000 cubic yards.
2002	Annual maintenance dredging removes 7,222 cubic yards from the north-south entrance channel.
2003	Annual maintenance dredging removes 5,334 cubic yards in June and another 4,289 is removed by emergency dredging in August due to shoaling in the outer entrance.
2004	The annual maintenance dredging event removes 6,500 from the entrance channel. Construction begins on the new breakwaters and entrance channel.
2005	The original entrance channel is dredged for the last time in June and closed off in July after construction of the new entrance channel. Construction on the new breakwater and causeway spur continues.
2006	The new entrance channel is dredged during two separate efforts in June and July resulting in the removal of 20,000 cubic yards. The breach through the sand spit is armored to prevent sloughing of material into the channel. New steel sheet pile is installed on the south side of the inner harbor. Aerial photography is also taken.
2007	Dredging in the entrance channel and east sediment trap removes 30,000 yards of material. Construction of the sheet pile replacement on the south side of the inner harbor is completed.
2008	A pre-dredge survey was conducted in June. Dredging removes 8,250 cubic yards from the inner harbor and another 25,927 cubic yards from the east sediment trap for a total of 49,595 cubic yards of material. A post-dredge survey was conducted in July. Construction of the sheet pile replacement on the Crowley (east) dock is completed.
2009	Annual maintenance dredging in June removes 30,000 cubic yards of material.

Progress of Work

- 2010 Dredging in June and July was accomplished using a hydraulic pipeline dredge to remove 25,965 cubic yards of sediments from the project and place them on the beach east of the harbor for beach nourishment purposes.
- 2011 Hydraulic dredging was conducted in June and July for a total of 34,109 cubic yards removed. The east sediment trap was not dredged due to inclement weather. Material was placed on the beach east of the harbor for beach nourishment. A November storm caused minor damage to the north bridge abutment fill with repairs scheduled for the following summer.
- 2012 Portable Hydraulic Dredging performed maintenance dredging in June and July, removing 75,219 cubic yards of material from the entrance channel and east sediment trap. Temporary repairs were made to the bridge abutments in May by the City of Nome. USACE Comprehensive Evaluation of Project Datums (CEPD) Compliance report completed and recorded in August.
- 2013 Annual maintenance dredging removed 20,570 cubic yards from the entrance channel and harbor basin. The east sediment trap was not dredged. The causeway bridge was grouted between the sheet pile wall and the cap beam.
- 2014 Annual maintenance dredging occurred in the entrance channel, harbor basin, and the -22 feet project depth area near the causeway docks. The east sediment trap was not dredged. Material was placed on the beach site adjacent to the sea wall. The south sheet pile wall factor of safety was increased by removing material in a 25-foot-wide width by 2-foot deep area along the AZ34/AZ18 section of the wall. About 630 cubic yards of soil was removed.
- 2015 An inspection of the causeway bridge was performed in mid-April from the sea ice and followed up by an underwater inspection in August. Only minor deficiencies were noted. A LRFR load rating was also completed this year for the causeway bridge. Annual maintenance dredging began in mid-June and continued through mid-August removing 116,505 cubic yards. Dredging was accomplished in the east sediment trap, inner entrance channel, and outer (-22 foot MLLW) entrance channel. All material was placed on the beach site adjacent to the sea wall. An obstruction was encountered during dredging in the outer entrance channel. A project condition survey of the harbor was conducted in August to include locating the obstruction using multi-beam sonar equipment.
- 2016 An inspection team cut a hole in the harbor ice and used an underwater camera to identify the obstruction in the outer entrance channel as a rock. Annual maintenance dredging removed 67,543 cubic yards from the east sediment trap, inner entrance channel, and outer entrance channel. All dredged material was placed on the beach located east of the harbor.

Progress of Work

- 2017 An inspection of the causeway bridge was performed in mid-April and late June. Only minor deficiencies were noted. Annual maintenance dredging removed a total of 82,520 cubic yards. Dredging occurred in the inner entrance channel through the transition as well as the east sediment trap. Additional sediment sampling was conducted to supplement the data collected in September 2013.
- 2018 Test pits were excavated in February to determine the material characteristics for a proposed widening of the maneuvering channel. The City conducts dredging in the Snake River in April for additional vessel moorage. A new, three-year maintenance dredging contract was awarded to Alaska Marine Excavation with 65,716 cubic yards removed. The US Naval Academy also assisted the Corps in finalizing an analysis of the sediment budget. A site visit in mid-September discovers significant shoaling under the causeway bridge.
- 2019 The biennial inspection found the causeway bridge in satisfactory condition. The harbor was ice free in mid-May, nearly a month earlier than normal. The shoal under the causeway bridge did not wash out from a winter storm. As a result, the maintenance dredging contract was modified to remove approximately 3,400 cubic yards under the bridge. A small bulldozer pushed the material to the cutterhead pipeline dredge which worked its way into the bank from the east sediment trap. Maintenance dredging was completed in late June removing 31,530 cubic yards. All dredged material was placed in the designated location for beach nourishment. A site visit in August finds the causeway breach shoaled.
- 2020 Annual maintenance dredging removes 100,135 cubic yards in June and July. Work included dredging the outer entrance channel and east sediment trap. A second attempt to remove approximately 5,500 cubic yards of shoaled material from the causeway breach was unsuccessful. A sediment trap along the beach west of the causeway is proposed to restore the sediment bypass mechanism. Chemical sampling of the west sediment trap material is conducted in September. An underwater inspection, which is required at least every five years, was also conducted for the causeway bridge in June in boots and hip waders. Planning began for a preventative maintenance and repair contract to address other minor deficiencies on the bridge components.
- 2021 Annual maintenance dredging removes 43,130 cubic yards of shoal material, which was placed in the beach nourishment site.
- 2022 Annual maintenance dredging removed 13,930 cubic yards of shoal material, which was placed in the beach nourishment site. Bristol Infrastructure completed repairs to the bridge girder coatings and added armor stone and material in the bridge sheet pile abutments. A bridge inspection was completed after the repairs were made. Typhoon Merbok impacted Nome in late September, abrading bridge girder coatings and displacing rock from the sheet pile cells. A post storm hydrographic survey did not find unusual shoaling.

Table 2 Cost to Date

Project	Description	Cost \$
010422	GI PED Appropriations	451,458
	GI PED Costs	451,458
	GI PED Contributed Appropriations	150,485
	GI PED Contributed Costs	150,487
	CG Appropriations	42,962,534
	CG Costs	42,671,614
	CG Contributed Appropriations	4,654,546
	CG Contributed Cost	4,585,255
012270	O&M Contributed Appropriations	187,500
	O&M Contributed Costs	187,500
072742	O&M Appropriations	59,699,459
	O&M Costs	57,733,530
087755	CG Appropriations	13,000
	CG Costs	13,000

Table 3 Range of Tides in feet

Tide Station	Mean Range	Diurnal Range	Extreme Range
946 8756 Nome, Norton Sound AK	1.04	1.53	16.52

NOAA Publication Date: 12/08/2020

Water levels are influenced more by wind than tide. Levels of 5 feet below MLLW have been observed during offshore winds and a level of 14 feet above MLLW has been observed during a southerly storm.

Controlling Depth Following Typhoon Merbok a post-storm survey was conducted September 21-23, 2022. Controlling depth in the Outer Entrance Channel is -16.3 feet MLLW; Controlling depth in the Transition Channel is -11.5 feet MLLW; Controlling depth in the Inner Channel is -9.8 feet MLLW; Controlling depth in the Approach Channel is -3.6 feet MLLW; Controlling depth in the Inner Harbor is -7.6 feet MLLW. The East Sediment trap was not surveyed during the post-storm effort but was surveyed during the June 2022 post-dredge survey and the controlling depth was -15.4.

Table 4 Dredged Quantities and Contract Costs

Year	Quantity (cubic yards)	Cost \$
2015	116,505	3,143,166
2016	67,543	2,378,325
2017	82,520	2,038,482
2018	65,716	1,683,218
2019	34,941	1,372,963
2020	105,635	3,059,037
2021	43,130	1,410,270
2022	13,930	979,250

Maintenance Dredging Supplement

A. General

1. Annual dredging of the Nome entrance channel is carried out by contract, typically for a three-year term.
2. Shoaling is the most pronounced in the portion of the entrance channel where it breaches the sand spit, followed by moderate shoaling in the sediment trap. Shoaling also occurs in the outer entrance channel but typically does not require annual maintenance dredging.
3. Maintenance dredging begins after ice out, typically in mid-June. Work must be accomplished in the channel where it breaches the sand spit as well as the inner harbor prior to the fish window of 1 July. However, within the protected area of the breakwater and seaward of the sand spit there is no closed period for maintenance dredging.
4. Dredging is accomplished with a hydraulic cutter-head and pipeline suction dredge.
5. Starting in 2010, dredged material has been placed on the beach for nourishment purposes.

B. Sampling & Testing

1. Five primary samples were collected in September 2013 to determine whether sediments have been impacted by fuel or metal contamination in the proposed dredging area. An additional eighteen samples were collected for a limited background metals investigation on the east and west beaches as well as in the Snake River. Sediments received classifications ranging from silty sand to poorly/well graded sand.

- Chemical analysis in 2013 was performed using six test methods. Antimony and arsenic exceeded Alaska Department of Environmental Conservation (ADEC) cleanup criteria for soils. All other samples resulted in none detected or below minimum levels as defined by ADEC 18 AAC 75 Method 2 Table B1 and B2 as outlined with results below:

Table 5 Chemical Testing

Method	Chemical analysis	Results
AK101	Gasoline Range Organics	ND (none detected)
AK102/103	Diesel Range Organics/ Residual Range Organics	All below minimum levels
Series 6000-7000's	(8) RCRA Metals	(8) of (8) detected; Antimony 1.2 - 4.1 ppm, Arsenic 13 - 200 ppm, all others below minimum levels
8260B	Volatile Organic Compounds	ND
8270C SIM	Polycyclic Aromatic Hydrocarbons	ND or below minimum levels

Project limits are defined by ADEC 18 AAC 75 Method 2 Table B1 and B2 Cleanup Levels

- Additional sediment sampling was conducted in 2017 and 2018.
- Water Quality: No field measurements were taken within the project and no chemical analysis has been conducted on any water samples.

C. Disposal

- Until 2007 the dredged material placement site was an area in Norton Sound formed by a four-sided polygon roughly 3,000 feet by 4,800 feet with the following geographic coordinates.

Table 6 Disposal Area

Corner	Latitude (N)	Longitude (W)
1	64°29'51.28"	165°24'50.83"
2	64°29'41.58"	165°23'37.19"
3	64°28'54.24"	165°23'38.87"
4	64°29'04.15"	165°24'35.89"

- Dredged materials are currently transported via pipeline to the beach placement site east of the project and used to nourish the beach in front of the City through littoral drift. The placement site is approximately 575 feet long by 305 feet wide and centered at 64°17'30.98" N 158°13'32.10" W.

3. The current disposal site capacity is adequate for normal dredge material placement, which is approximately 69,000 cubic yards per year. 2015 was the first year that greater than 100,000 cubic yards were pumped to the beach placement site.
4. The material dredged at the head of the turning basin in 1995 was effectively deposited within the project and capped due to its hazardous nature. This process was repeated in 1996 to contain the contaminated sediment and still maintain project depth.

D. Environmental Permits and Reports

1. Environmental Assessments (EAs) were completed in March 1990, April 1998, and October 2012. A supplemental EA was completed in March 2015 revising the scope outlined in 2012. A public notice issued in February 2017 extended the work period covered under the 2015 supplement. The most recent EAs for maintenance dredging were completed in September 2017 and September 2020. Findings of No Significant Impact (FONSI) were signed in June 1990, July 1992, June 1998, December 2012, May 2015, October 2017, and most recently in November 2020.
2. The following permits or authorizations have been issued for current dredging operations:

Table 7 Environmental Permits

Agency Name	Purpose	Date of Issue	Date of Expiration
AK Department of Environmental Conservation	Section 401 Certificate of Reasonable Assurance ER-15-06	21-Sep-17	21-Sep-22
AK Department of Fish and Game	Fish Habitat Permit FH13-III-0027	15-Jan-13	31-Dec-22
AK Department of Fish and Game	Fish Habitat Permit FH13-III-0027, Amendment #1	12-Jun-13	06-Jul-13
AK Department of Fish and Game	Fish Habitat Permit FH13-III-0027, Amendment #2	20-Jun-14	06-Jul-14
AK Department of Fish and Game	Fish Habitat Permit FH13-III-0027, Amendment #3	11-Mar-15	31-Dec-22
AK Department of Natural Resources	Section 106 Assessment – National Historic Preservation Act	31-May-12	n/a
NOAA - National Marine Fisheries Service	Section 7 Consultation - Endangered Species Act	30-Mar-15	n/a
US Fish and Wildlife Service	Section 7 Consultation - Endangered Species Act	22-Sep-17	n/a

**A substantial change in project scope would trigger additional agency review and project authorization.*

Nome Harbor, Nome, Alaska



Geotechnical investigation for proposed widening of channel, February 2018



Significant shoaling under the causeway bridge, September 2018

Nome Harbor, Nome, Alaska



Pushing material under the causeway bridge towards the sediment trap, June 2019



Dredging shoaled material near the sediment trap and causeway breach, June 2019