NPS Form 10-900 OMB No. 1024-0018

United States Department of the Interior
National Park Service

National Register of Historic Places Registration Form

This form is for use in nominating or requesting determinations for individual properties and districts. See instructions in National Register Bulletin, *How to Complete the National Register of Historic Places Registration Form.* If any item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, architectural classification, materials, and areas of significance, enter only categories and subcategories from the instructions.

1. Name of Property

Historic name: _Palisades Dam and Powerplant Historic District ___________
Other names/site number: _N/A______________________________________
Name of related multiple property listing**:**
_N/A____
(Enter "N/A" if property is not part of a multiple property listing

2. Location

Street & number: U.S. Hwy 26, 0.81 miles south of junction of US 26 and Forest Road 260
City or town: _N/A____________ State: _Idaho____________ County: _Bonneville________
Not For Publication: n/a Vicinity: n/a

3. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act, as amended,

I hereby certify that this _X__ nomination ___ request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60.

In my opinion, the property _X__ meets ___ does not meet the National Register Criteria. I recommend that this property be considered significant at the following level(s) of significance:

___national ___statewide _X__local

Applicable National Register Criteria:

__X_A ___B ___C ___D

____

Signature of certifying official/Title: Date

____

State or Federal agency/bureau or Tribal Government

In my opinion, the property ___ meets ___ does not meet the National Register criteria.

____

Signature of commenting official: Date

____

Title : State or Federal agency/bureau or Tribal Government

4. National Park Service Certification

I hereby certify that this property is:

___ entered in the National Register

___ determined eligible for the National Register

___ determined not eligible for the National Register

___ removed from the National Register

___ other (explain:) ______________________

Signature of the Keeper   Date of Action

5. Classification

Ownership of Property

(Check as many boxes as apply.)

Private: [ ]

Public – Local [ ]

Public – State [ ]

Public – Federal [x]

Category of Property

(Check only **one** box.)

Building(s) [ ]

District [x]

Site [ ]

Structure [ ]

Object [ ]

Number of Resources within Property

(Do not include previously listed resources in the count)

Contributing	Noncontributing	
2	0	buildings
1	0	sites
7	1	structures
	0	objects
10	1	Total

Number of contributing resources previously listed in the National Register n/a

6. Function or Use

Historic Functions

GOVERNMENT/public works INDUSTRY/waterworks, energy facility
LANDSCAPE/park
RECREATION/outdoor recreation

Current Functions

GOVERNMENT/public works
INDUSTRY/waterworks, energy facility

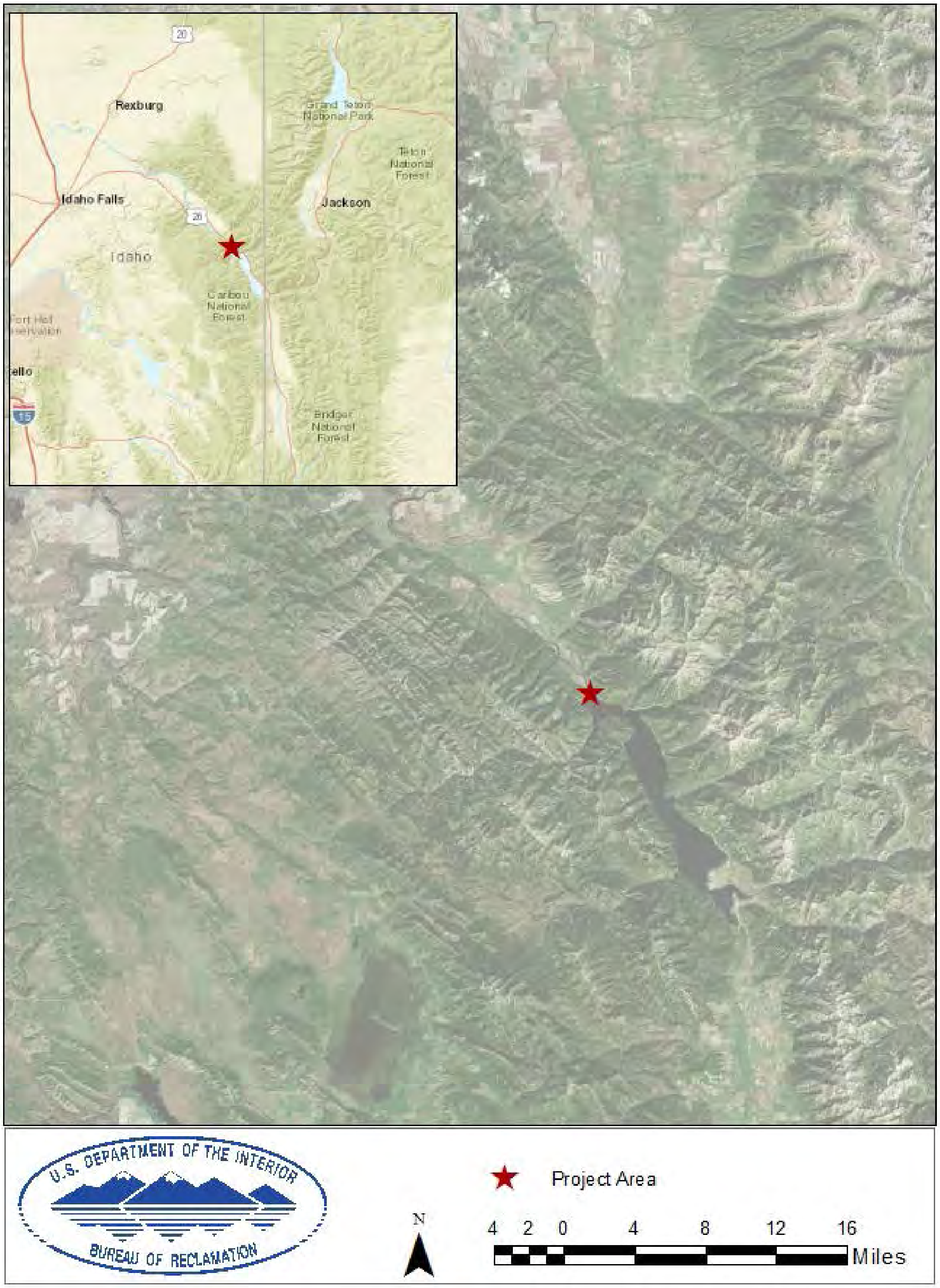
7. Description

Architectural Classification

OTHER/Utilitarian
OTHER/Zoned earthfill embankment dam

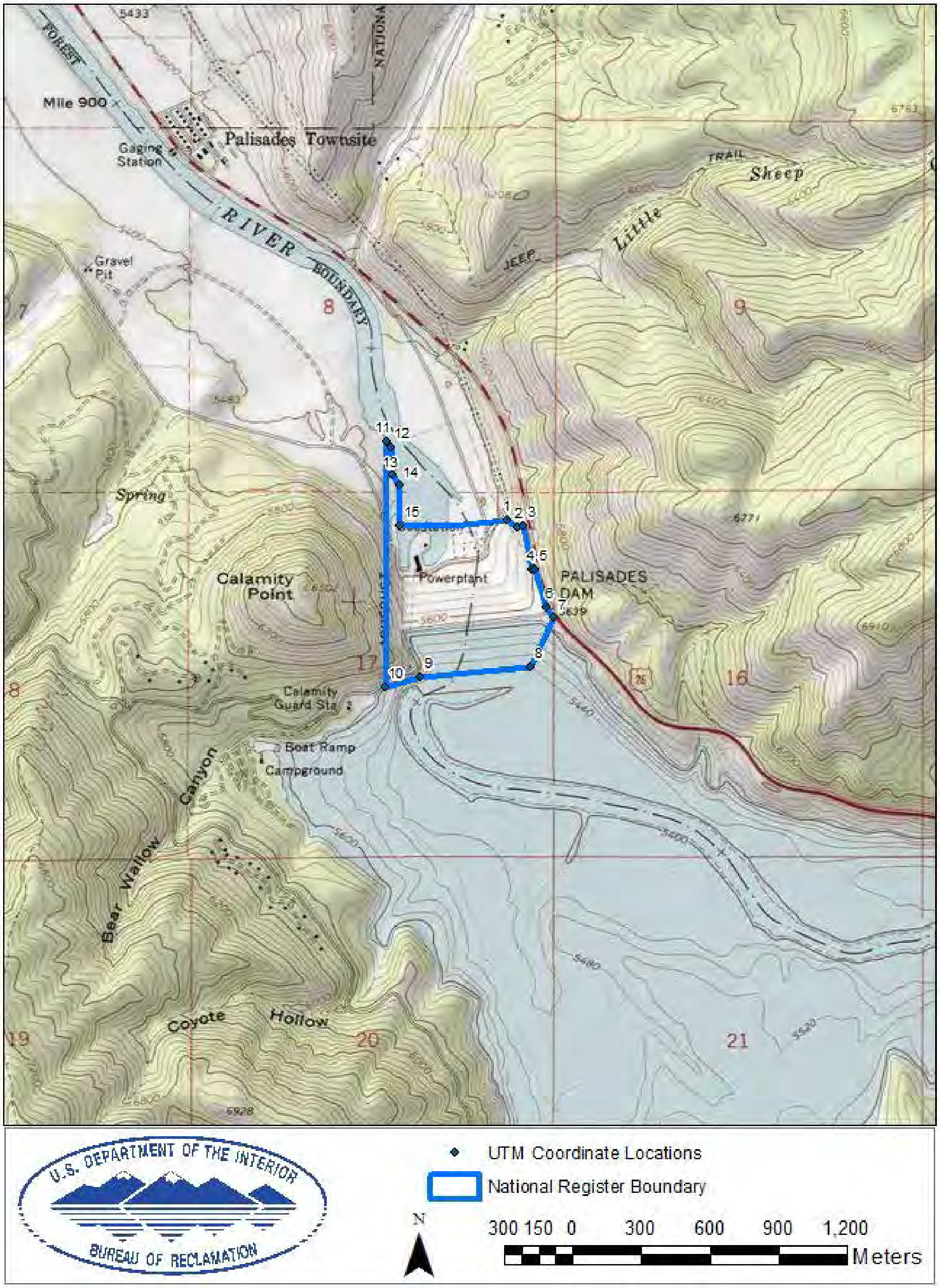
Materials: (enter categories from instructions.)
Principal exterior materials of the property:
FOUNDATION/EARTH, CONCRETE
WALLS/BRICK, CONCRETE
ROOF/METAL/aluminum, ASPHALT, CONCRETE
OTHERMETAL/steel

Map 1. Location Map.



Map 2. USGS Topographic Map

Palisades Dam, Idaho



Narrative Description

Summary Paragraph

Palisades Dam and Powerplant (Palisades) is located in eastern Idaho on the South Fork of the Snake River about 11 miles west of the Idaho-Wyoming border. The nomination is of a historically and functionally related grouping of properties associated with the Palisades Project (Project) at Palisades Dam. They were all constructed by the Bureau of Reclamation between 1951 and 1958. The Palisades Dam and Powerplant Historic District encompasses seven structures (the dam embankment, the spillway works, the power outlet works, the river outlet works, the stilling basin, the switchyard, and the crest road), two buildings (Palisades Powerplant and the gate house, also called the outlet works control house), and one site (Vista Park). All are contributing to the historic district; there is one non-contributing resource (access road) within the boundaries of the historic district. Palisades Dam, a zoned earthfill embankment dam, located at Calamity Point where a narrow constriction of the Snake River Valley, which impounds Palisades Reservoir. Palisades Reservoir occupies approximately 16,000 acres upstream from the dam and is contained by steep canyon walls rising above the river valley. The dam measures 2,100 feet long, 2,100 feet wide at the base at the dam's maximum section, 40 feet wide at its crest, with a 270 foot structural height. The spillway, gate house, river outlet works, power outlet works, and stilling basin are located at the dam's left (west) abutment. The river outlet works and the power outlet works convey water through tunnels running approximately 230 feet below the dam's crest. Water is first released through the power outlet works, supplying water to the main generating bays inside the powerplant. When additional releases are required, they are made through either the river outlet works and released through the gate house into the stilling basin, or are diverted from the power outlet works for release through the gate house. The spillway, with an intake located at the 5620 foot elevation, is used to release water excess to reservoir capacity. The Palisades Powerplant is located below the dam, toward the west end of the dam and east of the stilling basin. The powerplant houses four vertical shaft generating units driven by Francis turbines. Both the powerplant and the gate house are simple, utilitarian buildings that are devoid of ornamentation. A fenced switchyard is situated downstream of the dam east of the tailrace, and Vista Park is downstream from the powerplant west of the tailrace[1].

The Palisades Dam and Powerplant Historic District possess a high level of historic integrity. All of the original structures and buildings associated with the primary operation of the dam and powerplant remain intact, in large part retaining their original design, workmanship, association, and feeling, and there have been few modifications to the setting and materials. Modifications have occurred to the powerplant building, primarily consisting of replacement of windows, and the addition of a machine shop attached to a secondary façade. Both alterations are harmonious with the original design and do not significantly affect the property's integrity. The interior spaces of the powerplant and gate house buildings retain integrity, and much of the primary operating equipment remains substantially intact. The interior spaces of the original powerplant machine shop has been modified. Ongoing maintenance and repair of the generators has resulted in internal reworking and rewiring of equipment, but they are

[1] The tailrace is the river channel immediately below the dam.

still substantially are original. Vista Park has been impacted by the demolition (2016) of the restroom. However, it retains sufficient integrity to be a contributing property to the historic district. Although it was considered contributing prior to demolition, the building's historic significance and function were secondary to the operation of the dam and powerplant, and its demolition does not significantly diminish the property's overall integrity. The interior spaces of the powerplant and gate house buildings retain historic integrity, and much of the primary operating equipment remains substantially intact. The interior spaces of the original powerplant machine shop has been modified. Maintenance and repair of the generators has resulted in internal reworking and rewiring of equipment, but they still substantially are original.

Narrative Description

Physical Setting *(Photos 1-3, 11; Map 4)*
From its headwaters in the southwestern part of Yellowstone National Park, the Snake River flows south through Wyoming for 130 miles before turning sharply northwest and passing through a deep canyon into Idaho and the Snake River plain. Palisades is located approximately 11 miles west of the Idaho-Wyoming border on the South Fork of the Snake River. Major land features of the Palisades project area include a portion of the upper Snake River drainage basin, Palisades is located within the Caribou-Targhee National Forest, approximately 55 miles southeast of Idaho Falls, the nearest city with a population of about 57,000.

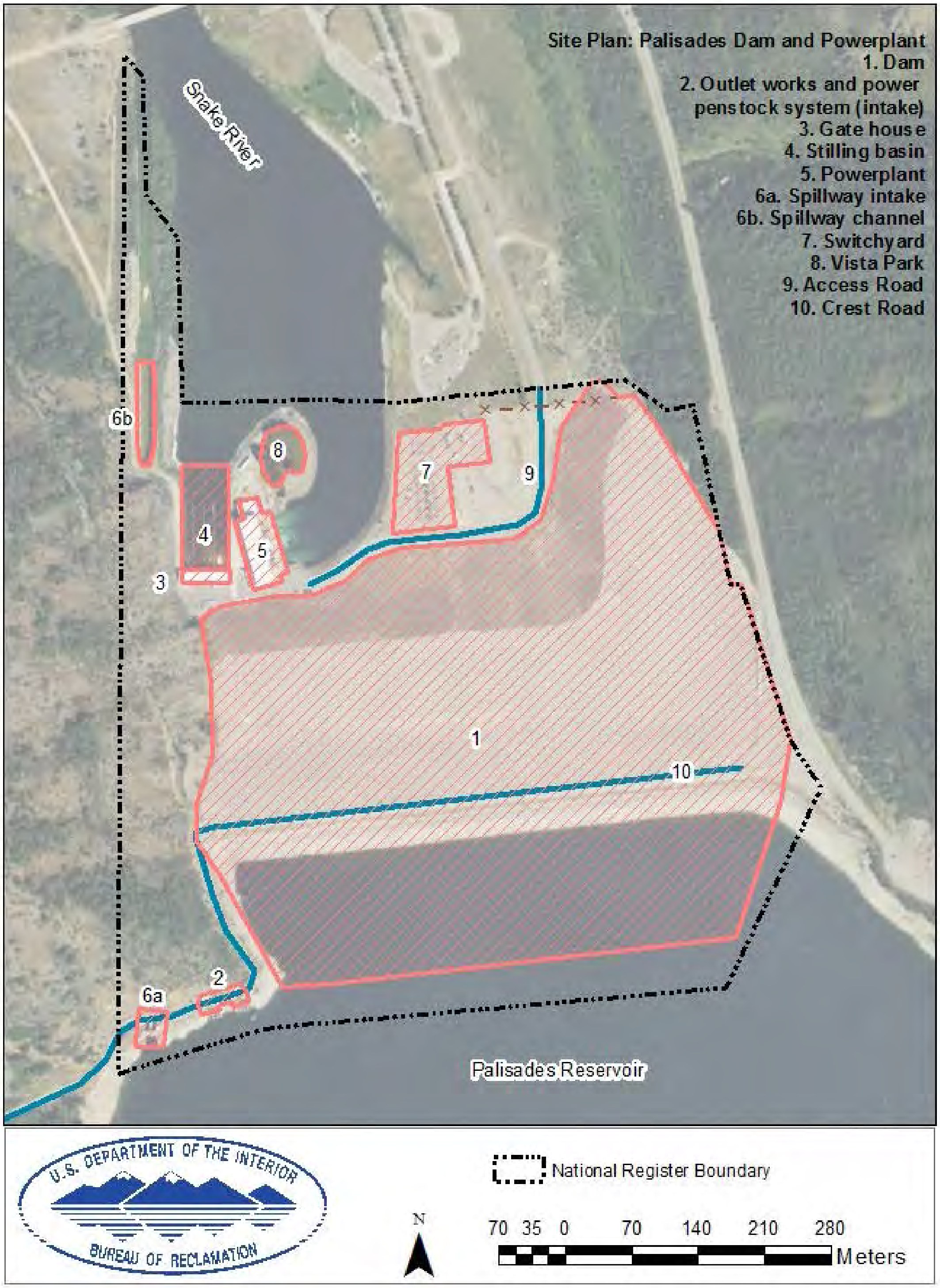
The dam impounds water creating Palisades Reservoir, which occupies approximately 16,000 acres and contained by steep canyon walls rising above the river valley. U.S. Highway 26, a paved, two-lane highway, skirts the hillside above the reservoir’s east edge.

Response to the Natural Environment
The location and design of Palisades Dam and its facilities are in direct response to the site conditions. Palisades Dam is located at Calamity Point where a large mass of igneous rock abruptly changes the course of the Snake River and creates a narrow constriction of the river valley. This site was chosen from among 27 locations considered by the Bureau of Reclamation in 1939 as the most attractive location for water storage development on the upper Snake River due to its geological suitability, the potential to store the largest volume of water using a dam with lowest height (reducing cost and time needed to build), and minimizing inundation of arable lands.

Calamity Point is a large mass of igneous rock that narrowly constricts the river valley, making it an ideal location for a dam. Upstream of Calamity Point lies a deep valley. The valley floor is a flat plain approximately 1,200 feet wide and contained by steep walls, creating a reservoir basin 2.5 to 3 miles wide and 18 miles long. On the west side, the canyon wall rises on a 60% slope to 1,300 feet above the valley floor; on the east, the canyon wall rises on a 50% slope nearly to the elevation of the crest of the proposed dam. The valley at this point in the river collects water from a drainage area of approximately 5,110 square miles, and the reservoir basin has a storage capacity of approximately 1,417,600 acre-feet (1,200,000 acre-feet of active storage).

Physical Description of Associated Properties
Palisades Dam and Powerplant Historic District encompasses seven structures, two buildings, and one site. See Map 3 for the site layout to understand the physical association of the properties.

Map 3. Site Plan.



1. Palisades Dam (1 structure)

(Photos 4-7; Map 3, Figures 1, 2, and 7)

Palisades Dam is a zoned earthfill embankment dam[2], containing 13,571,000 cubic yards of earthen materials. The dam is 2,100 feet long, with a maximum base width of 2,100 feet, crest width of 40 feet, structural height of 270 feet, and hydraulic height of 249 feet. The dam's right abutment is curved and extends both upstream and downstream to form supporting blankets. Water can be released through two outlets and the spillway, all at the dam's left abutment. All water releases return to the Snake River below the dam.

Records dating from the time of construction document Reclamation's design and construction processes for the dam. The engineers utilized standard procedures, first investigating the characteristics of the site and foundation materials (river bed, valley floor, and canyon walls), as to stability and permeability, and also assessing soils and gravels for suitability as materials to use to construct the embankment. They found the riverbed and right abutment to be highly compacted, generally impermeable alternating layers of clayey silt, sandstone, clayey sand and gravel, and conglomerate. The left abutment was found to be a hard, exceedingly sound, andesite intrusion. Given these materials and conditions, the embankment is constructed of four zones of materials available at the site: (1) an interior zone of impervious fine-grained material; (2) intermediate zones placed upstream and downstream of the interior zone, of relatively impervious transition material; (3) outer zones of pervious material; and (4) a rockfill zone at the downstream toe. The upstream slope of the embankment is protected by three feet of riprap, and the downstream slope is protected by a cobble and boulder blanket of variable thickness. A 300-foot-wide cutoff trench is located in the dam foundation under the central impervious zone. A 100-foot-wide cutoff trench extends along the upstream toe of the embankment across the valley up to the right abutment. The impervious zone 1 materials extends at the foundation as a blanket from the interior of the dam to the upstream cutoff trench. Two concrete cutoff walls are located at the left abutment where the andesite is exposed by excavation of the main cutoff trench.[3]

The upstream face of the dam has a 3 to 1 slope from the crest (at 5,630 feet) to elevation 5,520 feet; the slope is 4 to 1 from 5,520 feet to 5,450 feet elevation; and below this elevation, the slope is 6 to 1 to the berm that forms the upstream toe of the dam. The downstream face of the dam has a 2.5 to 1 slope from the crest to elevation 5,550 feet; the slope is 3.5 to 1 from 5,550 feet to 5,450 feet; and below this elevation the slope is 6 to 1 to the original ground surface. The powerplant is set close to the dam's toe, with a steeper 6 to 1 slope on the downstream face of the dam immediately upstream from the powerplant. This placement was possible because foundation explorations indicated that locating the powerplant further

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[2] A 'zoned earthfill' embankment dam is a dam composed of distinct zones of compacted earthen materials. Structural height is the distance from the lowest point of the foundation to the dam crest. Hydraulic height is the height from the river bed surface to dam crest.

[3] United States Department of the Interior, Bureau of Reclamation. "Technical Record of Design and Construction Palisades Dam and Powerplant" (Denver, CO: Bureau of Reclamation, 1960), 15.

upstream would result in a stronger foundation.[4] On the right abutment, the downstream slope of the dam is curved and extended as a supporting blanket.

2. River and Power Outlet Works and Power Penstock System (2 structures)
(*Photos 8-10; Map 3, Figures 1, 2, 8*)

The river outlet works and the power outlet works consists of two parallel tunnels excavated at river level through bedrock at the dam's left abutment, with an intake structure at their upstream end to control flow of water into the tunnels. Initially, these tunnels were used to divert the river during the dam's construction, and after they fulfilled that purpose, the upstream ends were plugged and they were adapted as penstocks (channels for conveying water) to serve the outlet gates and power turbines. Releases are directed first through the powerplant turbines to the extent of power demands, and if additional releases are required, they are made through the river outlet works system.

An intake structure is situated at the head of each of the river outlet and power tunnels. The intakes each consist of a gate-controlled mouth opening at elevation 5452.43 that allows water to flow to the tunnel, structures that support protective trash racks, hoist mechanisms and structures to operate the gate, and a hoist house on top of the dam crest.

The intake mouths each consist of rectangular, semi-bellmouth-shaped entrance opening covered by a trashrack structure. The intake structures are recessed into notches in the dam's face so that the trashracks are about flush with the face. The upper supporting members of the trashrack structure consist of inclined concrete beams and supporting bents that create intake guards.

The gates are fixed-wheel closure gates, each operated using a hydraulic hoist mounted in a concrete housing at the top of the intake structures at elevation 5,642 feet. The hoists are installed on a grade parallel with the sloping face of the intake structure and supported on beams inside the hoist house. In addition to the hoists and controls to operate the fixed-wheel gates, the intake gate structures contain rooms housing oil pumps, air compressors and other control equipment. The intake gate structures measure 28 by 28 feet and consist of three floors, two above ground and one below. The upper two floors have a single window on the south façade and the second story has a second window on the east façade. Access is through a single door on the south façade. Each floor consists of a single open room with metal stair access to the room above/below. The trashrack abutment walls support the bridge for the dam crest road as it crosses the intakes. The bridge consists of three spans – two 51-foot long outside spans bridging the intake structures, and a center 59-foot long span bridging the gap between the two intakes. The bridge has rails for a tra
shrack gantry crane, and a bent and beam structure is continued from the right end of the bridge to provide a parking structure for the crane. Shortly after the dam was placed into operation, the trashrack at the intakes failed, and the operating crane was removed from the deck

The two tunnels are spaced at 125.5 feet apart on their centers, and roughly parallel the spillway tunnel, which is located about 175 feet to the left (west) of the river outlet tunnel. The tunnels are 26

[4] Ibid., 6.

feet in diameter, concrete lined in their sections lying upstream of the axis of the dam, and are a steel pipe encased in concrete in their downstream section to prevent leakage. The power tunnel is 990 feet long, and then continues as a cut-and-cover conduit for an additional 324 feet to match the length of the river outlet tunnel. The power tunnel terminates in four 14-foot diameter penstock branches each of which leads to a generator in the powerplant.

Penstock manifolds encased in concrete are installed downstream from the power and outlet tunnels and divide the flows through branch takeoffs to the individual control gates and turbines. The right penstock tunnel is the power tunnel and delivers water to the four powerplant turbines and the two right outlet gates, which empty into the outlet works stilling basin (designed to dissipate flows before they are returned to the downstream channel). Water can also be diverted from the tunnel before entering the penstock branches, allowing its return to the river without going through the powerplant. The diversion occurs via two 12-foot diameter penstock bypass branches, with flow of water from the tunnel into each bypass branch controlled by a 7.5 by 9 foot slide gate. The bypass branches carry the water to the gate house, where it is released into the spillway basin through two outlet gates at the right side of the gate house.

The river outlet tunnel measures 1,324 feet long. The river outlet tunnel terminates in the gate house and water empties into the stilling basin through the remaining four outlet gates and two regulating valves.

With the reservoir at minimum power head level (elevation 5,497.5 feet), the river outlet works and power outlet works together have a flood control release capacity of 30,000 cubic feet per second (cfs). At minimum power head, releases through the four powerplant turbines operating with the gates fully open have a capacity approximating 7,000 cfs. The river outlet tunnel's capacity is approximately 23,000 cfs. At full reservoir elevation (5,620 feet), the capacity increases to approximately 33,000 cfs.

3. Gate House (Outlet Works Control House) (1 building)
(Photos 11-14; Map3; Figure 1, 2, 9, 12,13)
Water from the river outlet works or that is diverted from the power tunnel is discharged into the outlet works stilling basin through four control gates and two needle valves housed inside the gate house (referred to as the outlet works control house in original construction plans and technical reports). The gate house straddles the ends of the outlet works and power penstock manifolds. The gate house substructure forms the headwall of the stilling basin spanning the full width of the basin.

The gate house consists of a mass concrete substructure in which the outlet pipes and gate chambers are embedded, and a brick and reinforced concrete superstructure that houses the gate hoists, traveling crane, and gate control mechanisms. The superstructure is 162 feet long (east to west) by 40 feet wide and rises approximately 32 feet high above the operating floor level. The substructure height from the discharge channel floor level to the operating floor level is approximately 20 feet. The interior of the building is split between two floors. The first floor consists of a single open room with the generator and power boxes. The second floor houses the hydraulics and has a separate room for the air compressors, the hatch to the catwalk and access shaft of gate house.

The architectural design of the superstructure is simple, utilitarian and devoid of any unnecessary ornamentation. The walls of the north, east, and south façades of the building are a 7’2” high cast-in-place concrete band on top of which is grouted brick masonry walls rising approximately 24-feet high. The concrete section rises to above the discharge openings. The masonry portion of the walls of the west façade, and approximately 20 feet of the west end of the south façade, are constructed of exterior brick veneer applied to an 8-inch-thick reinforced concrete structural wall. The west façade faces the steep hillside, and was built using reinforced concrete in order to withstand loads caused by snow or landslides from the steep abutment slope. Placement of a brick veneer does indicate that aesthetics were considered to some extent in the design. The building has few windows, which are placed in a row resting atop the concrete base wall on the north and south façades. The windows are set with nine panes in a 3x3 pattern. The frame is metal. The main access to the gate house is on the east façade, where there is a rolling door for equipment and vehicles. A solid metal door for pedestrians is located on the west end of the south façade. The roof is constructed the same as the powerplant with precast concrete panels with no pitch. A short wall runs around the perimeter of the roof.

The gate house contains the six 7.5- by 9-foot outlet control gates and hoists with their companion ring follower gates of the same size, the two 96-inch hollow jet valves with their companion guard gates, a 30-ton overhead service crane, and the gate and valve control equipment. The building is divided internally into two bays. The left bay contains the four control gates and both valves served by the river outlet works tunnel, and the right bay contains the two control gates for the bypass flows from the power outlet tunnel.

<u>4. Stilling Basin (1 structure)</u>

(Photos 12, 15; Map 3, Figures 1, 2, 12, 13)
Flows discharged through the outlet works control gates and valves empty into a hydraulic-jump-style stilling basin below the gate house. The stilling basin is designed to dissipate the high energy of the releases before they are returned to the downstream river channel. The basin consists of an upper chute and a lower channel and is uniformly 161.5 feet wide. The upper chute drops parabolically 33.5 feet in a 190-foot length. The lower channel has a 160-foot long horizontal apron placed approximately 30 feet below the low tailwater level.

The chute and apron floors are reinforced concrete slabs anchored to the foundation rock. The stilling basin’s sidewalls vary from a height of about 22 feet at the upper end of the chute to a maximum height of 55 feet along the horizontal apron section. The left wall is reinforced concrete slab lining anchored into the excavated rock slope. The right wall along the chute is a thick cantilever diversion wall backed up by the concrete block that encases the power penstock manifold. The right wall along the horizontal apron is reinforced concrete with a counterforted design.

The upper chute has three intermediate dividing walls extending from near the upper end of the chute to about half the length of the horizontal apron to divide the upper section into four separate sections, which allows for stilling action for separate or unsymmetrical releases from the gates or valves. The tops of these dividing walls are placed at the approximate level of the control gate sills in order to separately confine flows as needed between the four sections: (1) the two left regulating gates; (2) the two hollow jet valves; (3) the two right regulating gates, all of which take off from the outlet tunnel manifold; and (4) the flows from the two regulating gates at the right side of the stilling basin which take off from the power penstock manifold.

In order to assist with dissipating excess energy, chute blocks (concrete blocks built into the inclined section of the spillway) are located at the junction of the chute and lower channel floor. Floor blocks (concrete blocks built into the floor of the channel) are located about at midpoint along the length of the lower channel's apron. A solid deflector sill is located at the downstream end of the basin floor.

5. Powerplant (1 building)
(Photos 11, 16-25; Map 3, Figures 1, 3, 4, 7, 9-11)
The powerplant consists of four generating units housed within a powerplant building. The powerplant is located at the downstream toe of the dam near the left abutment, situated on the neck of a small peninsula with the stilling basin to its left and the tailrace to its right. It sits at approximately the natural river valley floor, at an elevation of 5,397 feet. Power is generated by the release of water stored in the reservoir into the power tunnel, which terminates at four penstocks that deliver water to the Francis turbines that drive the generators inside the powerplant.

The powerplant building consists of a substructure made of reinforced concrete, a superstructure of structural steel framing with reinforced grouted brick walls, and a roof made of pre-cast concrete slabs on steel girders. The height is 111 feet from the bottom of the substructure to the roof. The powerplant building is approximately 246 feet long (essentially north/south), 60 feet wide, and 62 feet tall from the operating floor at grade to the roof.

An extension, approximately 32 feet wide, 68 feet long and 31 feet in height, is attached to the main powerplant building. It extends from the south end of the powerplant's west façade, and utilizes the same materials and design as the main building, with the exception of structural height. Originally used as the machine shop, it was converted for other uses in 2005 when a new machine shop was built. On the west side of the powerplant building, separated by a 1-inch expansion joint are four 16x16 foot butterfly valve hatches. A concrete transformer deck extends from the powerplant building's east façade, cantilevered over the tailrace. Four transformers, grouped in pairs, are located on the deck, above which is the power takeoff structure with powerlines running across the river to the switchyard. A small mobile crane runs on rails set in the deck along the front of the transformers.

The powerplant shares the simple utilitarian architectural design described for the gate house, with the 7'2"-high cast-in-place concrete band on top of which are grouted, dark red brick masonry walls, uninterrupted except as required for fenestration. A continuous band of windows is placed directly below the roofline on the east and west façades to provide natural light the interior of the plant. The original single-pane windows were separated by regularly spaced mullions held in place by a grouted joint. Bands of insulated metal panels are installed below the roofline on the west and east façades to continue the visual line created by the windows. In 2014, the windows were replaced with solid glass block windows with regularly spaced mullions to maintain the historic appearance. An additional six windows are located on the second floor of the powerplant, in the office portion. These are single pane windows with four horizontal panes separated by mullions, similar to the original band of windows at the top of the building. A 1960 report describes the powerplant's design, and is indicative of Reclamation's pragmatic approach toward its design and aesthetic. The report states "The exterior brick masonry walls are faced with dark red brick, unbroken except as required for fenestration. The reinforced grouted brick walls were selected for the structure because brick was available at a reasonable cost in the nearby area and this made masonry wall construction considerably cheaper than concrete."[5] Despite this practical approach, some consideration was given to architectural aesthetics as the same report describes the insulated metal panels that were installed on the west and east façades of the powerplant to continue the lines of fenestration below the roofline from the north and south façades.

The main access to the powerplant is on the east façade, south of the transformer deck through a solid metal door for pedestrians and a 20-foot by 23.5-foot rolling door for equipment and large vehicles. Rails embedded in the concrete floor allow for the passage of the transformers through the rolling door for maintenance. An overhead, 150-ton bridge crane supported by crane girders and rails supported on steel columns is 43 feet above the generator room floor, and is used to perform maintenance on the generators and otherwise move heavy materials around the main generating bay of the powerplant.

The interior of the building has not changed except as detailed below. It is divided into three functional areas: main generating bay, service bay, and the machine shop. The main generating bay of the powerplant houses the four generating units set on mass concrete. Generating units 1 and 2 and units 3 and 4 are spaced 47 feet apart and units 2 and 3 are spaced 49.5 feet apart. Each generating unit consists of a synchronous, vertical-shaft generator, rated at 46,464 kilovolt-amperes each with a direct – connected exciter driven by a 44,253-horsepower Francis turbine at 163.6 revolutions per minute under a rated head of 190 feet and a discharge of 2,200 cfs. The turbines are in a scroll case which is embedded in mass concrete below the generator room floor. The maximum head (vertical distance the water travels) is 245 feet. Except for the offices, control room, and other administrative areas on the south end of the building the interior of the building is concrete on the lower level and exposed brick on the upper two levels. The steel girders are completely visible.

The four generating units were upgraded between 1990 and 1995. After these upgrades were completed, a new record for power output was established with a continuous output of 176 megawatts, representing about a 40% increase above the previous record of 125 megawatts prior to upgrades. [6] Additional runner upgrades performed from 2012 to 2016 further increased capacity by 3.8% overall.

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[5] United States Department of the Interior, Bureau of Reclamation. "Technical Record of Design and Construction," 175.
[6] William Joe Simonds, "Palisade Project" (Project History, Bureau of Reclamation, 1995), 21

The service bay is located at the south end of the powerplant and includes the control room, and three floors below the generating room floor used for service, maintenance, control and operation of the plant. Access stairwells to the lower floors are located in the southwest corner and north side of the powerplant. The 2005 machine shop attached to the north side of the building is used for routine maintenance, welding and storage. The original shop is now used as a break room, shop and a unisex bathroom has been installed.

6. Spillway (1 Structure)

(Photos 26-27, Map 3, Figures 1, 2, 7, 8)

The spillway consists of a gate-controlled tunnel excavated through the left dam abutment that leads to an open-cut outlet channel below the dam. Releases of flood control storage are normally made through the powerplant turbines and outlet works. The spillway functions as an auxiliary device to release outflows in excess of those that can pass through the power outlet and river outlet works. The spillway was designed for a discharge capacity of 47,000 cfs when the reservoir water level is full (elevation 5,620 feet) and a maximum discharge capacity of 48,400 cfs with a water surface elevation of 5,621 feet.

The concrete crest of the spillway inlet is at an elevation of 5,570 feet. Water flow into the spillway tunnel is controlled by two 20- by 50-foot radial gates (Tainter gates) installed on top of a concrete control structure. The elevation of the top of the gates is at 5,620 feet, which is the reservoir surface elevation when the reservoir is full. After passing the spillway control gates, water passes through a 50-foot-long parallel-sided open section, then enters a inclined transition shaft which connects to the spillway tunnel. The tunnel, a 28-foot inside-diameter concrete-lined tunnel approximately 1,675 feet long, runs on a nearly horizontal plane to empty into a 350-foot-long concrete-lined open-cut outlet channel. The bottom width of the outlet channel is 28 feet and the sides are sloped ½ to 1. A three-foot high trajectory lip at the bottom of the outlet channel redirects flows upward away from the end of the structure. The water then enters an approximately 985-foot long open, unlined channel excavated into the river bed, which delivers the flow back to the river approximately 1,880 feet below the dam. A concrete weir was constructed across the downstream channel in 1970 to aid in dewatering the channel for inspection and repairs.

7. Switchyard (1 Structure)

(Map 3; Photo 28)

The switchyard is situated below the dam on the east bank of the tailrace. The switchyard is the distribution hub of the Powerplant. Power is distributed to Cattle Creek, Snake River, and Lower Valley Energy Companies along the 115-kilovolt lines, a 12.5-kilovolt line also goes to Lower Valley, but also powers the Powerplant and the government camp located downstream. The switchyard is ground-mounted aluminum pipe bus-type. The switchyard is composed of 115- and 12.5-kilovolt galvanized steel structures mounted on pad and pedestal type foundations and located in bays within an area enclosed by chain link fencing. The yard sits on embankment fill that ranges from 12 to 22 feet in depth and is comprised of zone 3 dam materials – compacted sand, gravel and cobbles. The switchyard has an 11.5-foot freeboard (vertical distance) above maximum tailwater level. Powerlines run from transformers situated on the powerplant's transformer deck (east façade) across the river to the switchyard, a distance of about 500 feet.

8. Vista Park (1 site)
(Map 3; Photos 29-30; Figures 14-15)
The site is a grassy park with a dozen mature shade trees and boat ramp, located downstream from the powerplant at the end of a small peninsula. The peninsula is an artificial landform created to accommodate the disposal field for the sanitary systems at the powerplant. The park was constructed in 1958 to accommodate visitors to the powerplant. The facilities originally included a public restroom building, which was demolished in 2016. Standing at the southern (upstream) end of the park, one has a view of the powerplant with the earthen dam embankment looming behind. An access road circles the edge of the peninsula and concrete steps lead from the south end of the park to the north side of the powerplant. Vista Park is no longer open to the public, and chainlink fencing is installed around the perimeter.

9. Access Road (1 Structure)
(*Map 3; Photo 28*)

The access road does not contribute to the District. An access road was built during construction and has remained in use since that date, to access the Powerplant. The access road originates off of U.S. Highway 26. The road also services a boat ramp and campground facility that is managed by a non-Reclamation entity. The road is a paved 2-lane road that ends at the power plant. It measures approximately 1,270 feet long within the gated fenceline. While the road provides access to the facility and is in the same location as the original road, the materials have long since been replaced, the design is not integral to the specific engineering features of the district.

10. Crest Road (1 Structure)
(*Map 3, Photo 7*)

There is a road originating at U.S. Highway 26 as the highway passes the crest of the dam. This road crosses the river via the dam crest and extends west past the spillway inlet along the west side of the reservoir to provide public access for recreational purposes. Concrete posts at 25-foot intervals delineate the edges of the roadway at the dam crest. A bridge spans the intake structures for the river and power outlets. It is a reinforced concrete deck consisting of three spans – two 51-foot long outside spans bridging the intake structures, and a center 59-foot long span bridging the gap between the two intakes. The intake trashrack structures support the bridge deck. Rails for a trashrack gantry crane are embedded in the bridge deck, and a bent and beam structure is extends the east end of the bridge that provided a parking structure for the crane. Shortly after the dam was placed into operation, the trashrack at the intakes failed, and the crane was removed from the bridge deck.

The dam crest roadway was closed to public vehicular access in 2012 as part of post-September 11th security measures, and a fence and crash gate have been installed to prevent unauthorized vehicles from accessing the crest road from U.S. Highway 26. The public is still allowed to walk on the crest road to access on the west side of the reservoir for recreational use. Unlike the access road, this road was specifically designed to accommodate the design and function of the dam.

Alterations

Alterations at Palisades Dam since the completion of construction in 1958 have been fairly minimal and have generally occurred due to upgrades in technology, changes in operational needs, and required security measures post-September 11th.

Some modifications have occurred to the powerplant and its machine shop. In 2005, the interior of the original powerplant machine shop was remodeled to include a battery room, offices, and a break and locker room for employees, which entailed the construction of new interior walls. All exterior features remained the same. A new addition was constructed on the north façade of the powerplant as a machine shop. The new machine shop was designed to harmonize with the powerplant's architecture, but be distinctive enough to be recognizable as an addition. The addition has the same 7'2"-high concrete base that terminates at the same height as the powerplant building's concrete base, with dark red metal siding above that is similar in color to the powerplant brick walls. To further distinguish the new machine shop from original construction, it is 31 feet tall with a split gable roof with a band of clerestory windows and white metal roofing *(Photos 17-18)*.

In 2014, the windows that form continuous bands of windows on the west and east façades below the powerplant's roofline. The Bureau of Reclamation conducted a window assessment in 2011, and that report indicated that the condition of the windows was poor with severe deterioration. The original 6-pane divided lite windows were replaced with glass blocks stacked within the original openings, with a vertical support at each original mullion location. Due to the height of the building, the details of the windows are not highly visible, making the change in material and style less noticeable.

The four generating units were upgraded between 1990 and 1995, and work included rewinding the generators, replacing the transformers, and repairing or replacing most of the electrical and mechanical components within the generators and turbines. The original switchboards remain and the generator housings remain intact.

The original wooden power poles that deliver power from the powerplant to the intake structures on the downstream face of the dam are scheduled to be removed and replaced with underground powerlines in 2016. In 2015, Vista Park was closed to the public and a chain link fence installed around the perimeter of the park. The restroom building was demolished in 2016.

The roadways around the powerplant have been altered through time. Originally the access road only led to the powerplant and a road that crossed the river to the area used a borrow pit for the project. The bridge across the river was demolished immediately following construction and it wasn't until 2011 that a new bridge was constructed in the same location. It can be see just downstream of the dam. The road across the river also used to climb the cliff to the left abutment of the dam. This road has fallen completely into disuse and is no longer drivable by vehicle traffic.

Historic Integrity

Palisades Dam and Powerplant possesses a high level of historic integrity. The alterations and minor changes to the Palisades structures and buildings since the period of significance (1951-1958) do not significantly affect the property's integrity. The principal contributing resources possesses integrity of location, setting, design, materials, workmanship, feeling, and association. All but one of the original structures and buildings retain their original use, and continue to be actively used on a regular basis.

Changes to the powerplant and its hydropower generating equipment do not significantly impact its historic character and integrity. The building remains largely unaltered, still representing its original architectural design with most original materials intact. While some alteration and replacement of worn out parts has occurred to the powerplant building interior and equipment to keep it at optimal performance, the resource continues to convey its design and historic function.

The demolition of the restroom had a significant impact upon the original functional characteristics of Vista Park, but the overall resource as represented by the landscape still serves to convey the sense of the recreational function created in support of public enjoyment of the facility.

Only one section of the roads still contributes to the eligibility of the district. The Crest Road over the dam includes several design and functional characteristics that conveys a sense of the historic materials and design in the operational needs of the facility. The access road to the powerplant and its split across the river do not possess these qualities and the latter has lost most of its functional integrity.

Table of Resources

(see attached site plan)

Contributing Structures (7 structures)

1. Dam
2. Outlet Works and Power Penstock System
4. Stilling Basin
6. Spillway
7. Switchyard
10. Crest Road

Contributing Buildings (2 buildings)

3. Gate House (Outlet Works Control House)
5. Powerplant

Contributing Site (1 site)

8. Vista Park

Non-Contributing Structures (1 structure)

9. Access Road

11 total resources

8. Statement of Significance

Applicable National Register Criteria

(Mark "x" in one or more boxes for the criteria qualifying the property for National Register listing.)

- [x] A. Property is associated with events that have made a significant contribution to the broad patterns of our history.
- [ ] B. Property is associated with the lives of persons significant in our past.
- [ ] C. Property embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.
- [ ] D. Property has yielded, or is likely to yield, information important in prehistory or history.

Criteria Considerations

(Mark “x” in all the boxes that apply.)

- [ ] A. Owned by a religious institution or used for religious purposes
- [ ] B. Removed from its original location
- [ ] C. A birthplace or grave
- [ ] D. A cemetery
- [ ] E. A reconstructed building, object, or structure
- [ ] F. A commemorative property
- [ ] G. Less than 50 years old or achieving significance within the past 50 years

Areas of Significance
POLITICS/GOVERNMENT
AGRICULTURE

Period of Significance
1951-1958 - dam construction
1958-1966 - operation

Significant Dates
1958 – dam construction

Significant Person
N/A___________________

Cultural Affiliation
N/A___________________

Architect/Builder
Bureau of Reclamation

Statement of Significance Summary Paragraph

Palisades Dam and Powerplant Historic District is eligible for listing in the National Register of Historic Places at the local level under Criterion A in the areas of Politics/Government, Engineering, and Agriculture.

In consideration of Criterion A, Palisades Dam and powerplant has achieved significance in Politics/Government as a an important final component of Reclamation's larger irrigation and water management program on the Snake River plain in the southeastern area of Idaho. In the first half of the 20th century, Reclamation had completed the principal features of the Minidoka Project, but continued inadequate storage prevented full realization of the area's irrigation potential. In response to a determined effort by affected irrigators, Reclamation received approval to construct Palisades Dam to provide supplemental water to resolve shortages. The hydropower component of the project aided debt repayment by the beneficiaries. The dam is a zoned earthfill embankment, and representative of how advances in technology by the mid-20th century enabled the construction of larger embankment dams, capable of storing more water, than possible before. The supplemental water stored behind Palisades Dam bolstered the agricultural economy of southeastern Idaho by providing a more reliable supply in drought periods and later into the growing season.

Narrative Statement of Significance

Physical Geography and Indigenous Peoples

The story of Palisades Dam and Powerplant originates in the southwestern part of Yellowstone National Park at an elevation of nearly 10,000 feet where the Snake River begins its journey to the Columbia. From its headwaters it flows south through Wyoming for 130 miles and is augmented by several important tributaries before turning sharply northwest and passing through a deep canyon into Idaho. Palisades is situated on the Snake River about 11 miles from the Idaho-Wyoming border, and flanked by high mountain ridges. To the southeast these mountain ridges merge with mountainous terrain along the Wyoming border; to the northwest, the mountains decrease in elevation before transitioning into the flat-lying lavas and sediments of the Snake River plain. The Snake River plain comprises 16,000 square miles of a gently rolling lava plateau made nutrient rich by the decomposition of lava rock and volcanic ash and a windborne material of silt and fine sand known as loess, which together result in an almost unparalleled fertility and excellent drainage.[7] Weather patterns are characterized by low humidity and rainfall, abundant sunshine, hot summers and moderately severe winters. In the high upper valley, annual precipitation averages 12 to 16 inches.[8] The Snake River follows an inverted arc across the southern part of Idaho before reaching the Oregon border and heading north through Hells Canyon to Lewiston where it flows another 140 miles west through Washington until joining the Columbia River. From its headwaters to its confluence with the Columbia, the Snake River travels 1,040 miles and drains 109,000 square miles. With its great potential for irrigation, power and recreation, the Snake River has played an essential role in the exploration, settlement and development of southern Idaho.

The region's cultural landscape represents over 10,000 years of use by Indian peoples. Ancestral lands of the Northern Shoshone and the Bannock encompass portions of present-day Idaho, Oregon, Nevada, Utah, Wyoming, and Montana. The Shoshone peoples are historically associated with, and continue to live on, the eastern Snake River plain of southeastern Idaho and northeastern Utah. After years of hostilities between native peoples and settlers, the Fort Hall Indian Reservation was established in 1863 and a peace treaty was agreed upon under the terms of the Fort Bridger Treaty of 1868. Fort Hall is located near Pocatello, approximately 70 miles to the southwest of Palisades.

Early Euro-American Settlement

First Euro-American settlement in Idaho was associated with the fur trapping industry and American pioneers crossing west. In the 1850's, American pioneers began traveling west on the Oregon Trail, which largely followed along the course of the Snake River from Fort Hall to what is now the Idaho/Oregon border. Pioneers did not find the Snake to be a friendly stream. The Snake's turbulent

[7] William. D. Gertsch, "The Upper Snake River Project: A Historical Study of Reclamation and Regional Development, 1880-1930" (PhD dissertation, University of Washington, 1974), 19-21.
[8] Ibid., 22.

flows made it difficult to cross. Most pioneers passed on through Idaho country, discouraged from settlement by the arid climate that made agriculture untenable without irrigation, and finding irrigation possible only in narrow belts along the rivers. Settlement of Idaho country began in earnest in the 1860s, with colonization by Mormon pioneers in southeastern portions of the future state, and towns established due to the discovery of gold and silver in northern and southwestern Idaho. In the early 1860s, Mormon pioneers traveled north from Utah and settled in the Cache Valley in southeastern Idaho. They founded Franklin, Idaho's first permanent Euro-American settlement and its first farming community. The settlers constructed a fort, dug a 3½-mile-long communal irrigation ditch, and established a sawmill, gristmill, and creamery. The orderly agrarian pattern with cooperative farmers' organizations established at Franklin was repeated throughout other Mormon settlements that followed in southeastern and central Idaho. In southwestern Idaho, a community was established on the doorstep of Fort Boise to provide food and supplies to miners in the gold fields in Idaho City. These first settlers diverted streams to irrigate lands near rivers that were accessible by gravity flow. As settlements grew and land immediately next to streams was no longer available, cooperatives and commercial 'enterprise' companies built small more complex canal systems to water larger areas of land. However, funding limitations kept most irrigation systems small and lacking storage dams.[9]

Federal Land Policy in the West: Reclamation of Arid Lands

Public land laws enacted between 1860 and 1900 were intended to facilitate settlement of arid western lands. However, they were only marginally successful, due in large part to the fact that the policies were drafted without regard for the climate and economic and physical realities of settlement and farming in the West. One of the earliest attempts by the Federal government to promote private development of arid lands in the West was the Homestead Act, passed by Congress in 1862. Under this Act, a homesteader could claim 160 acres and up to 320 acres for a husband and wife. The 1862 Homestead Act anticipated farming conditions like those found in the relatively moist eastern United States. Homesteaders in Idaho, like in other western territories and states, were unable to sustain themselves on this limited acreage in the absence of irrigation. Many settlers claiming lands under the Homestead Act failed to 'prove' their claim, or sold their land soon after obtaining title. The 1877 Desert Land Act recognized the need for larger acreage to sustain a family in the West and allowed a family to acquire an entire 640-acre section, and placed a requirement that a portion of the claim be irrigated. Policy makers who passed the Desert Land Act envisioned individual farmers using private capital to build small-scale irrigation works for their personal use.[10] However, the reality in the arid West was that the capital required to irrigate anything other than lands immediately adjacent to a stream was well beyond the capacity of an individual or small private enterprises.[11] Despite the limited success of past policies and practices, the federal government continued undeterred in its endeavor to settle arid western lands for farming without direct Federal aid or involvement.

[9] F. Ross Peterson, *Idaho, A Bicentennial History* (New York: W.W. Norton and Company, Inc., 1976), 20-30; 53-4; 123-5.; Gertsch, "The Upper Snake River River Project" 26, 31-3.
[10] Richard A. Slaughter, "Institutional History of the Snake River 1850-2004" (Contribution Number 1062, Joint Institute for the Study of the Atmosphere and Ocean, NOAA Cooperative Agreement No. NA17RJ11232, undated), 4.
[11] Gertsch, "The Upper Snake River Project," 39.

John Wesley Powell's 1878 *Report on the Lands of the Arid Region of the United States* was an influential study of the American West's geology and water resources, and established the premise storage reservoirs supplying irrigation systems were necessary for agricultural development of the arid West. Powell noticed that the 100th meridian (the longitudinal line that lies 100º west of the Greenwich Meridian) acted as a convenient dividing line between the relatively moist conditions of the eastern United States and the more arid West. Powell concluded that west of the 100th meridian and east of the Pacific coastal zone, it was not viable to rely on dry farming. Powell argued for the Federal government's direct intervention was necessary to control the rivers and store and distribute water in an orderly and efficient manner. An 1890 census of irrigated farms, prepared by Frederick H. Newell of the U.S. Geological Survey, described the inefficiency of individual and small-group irrigation projects caused by the lack of comprehensive reclamation activities. These reports fueled a growing advocacy by Western irrigation interests, working at the regional and national levels, for a comprehensive, planned approach to large-scale water projects. Most desired Federal funding and government leadership in those developments. Amidst this backdrop, and recognizing existing public land policies had proven largely unsuccessful, Congress passed the Carey Act in 1894 to increase the viability and scale of irrigation in the West, but without taking the step of direct Federal funding and involvement.[12] The Carey Act allowed for land grants of up to one million acres of unclaimed Federal land to each western state with desert land. Each state was to submit a plan for the development of lands they wished to granted, and were then responsible for administering the program in a manner that caused "said lands to be reclaimed, and to induce their settlement and cultivation…" Although the Carey Act facilitated larger scale private development, successful development under the Act was limited. In good part this was due to lack of sufficient capital to allow construction of storage reservoirs or to complete larger systems of canals.[13] It is notable that Idaho was home to a number of highly successful irrigation developments with their roots in the Carey Act. One such success story is that of the Twin Falls Canal Company, a private enterprise that built both a dam to provide storage and a canal and delivery system. That system has been in continuous operation since 1909. Despite its limited success, the Carey Act represented the transition of public and Federal perspectives on irrigation development, paving the way for the significant federal intervention in reclamation activities seen in the 20th century.[14]

The challenge remained to develop a mechanism capable of supporting dam and canal construction at a large enough scale to provide long-term storage to ensure water during dry years. By the turn of the century, public opinion and political support was shifting toward favoring federal development of large-scale irrigation projects, although opposition remained from members of Congress that held the philosophical view that settlement was a personal or private enterprise.[15] In 1902, after years of debate, the Reclamation Act was signed by President Theodore Roosevelt. It directed the Secretary of the Interior to construct irrigation projects for the reclamation of arid lands of 16 Western states (soon expanded to include Texas). The efforts were to be funded from the sale of public lands in the West,

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[12] Paul Wallace Gates, History of Public Land Law Development, (Washington, D.C.): William W. Gaunt and Sons, 1987), 649.
[13] Slaughter, "Institutional History of the Snake River," 5.
[14] Ibid., 5.
[15] Gates, *History of Public Land Law Development,* 649.

and from repayment of construction costs by the farmers on the irrigation project lands. The Secretary soon established the U.S. Reclamation Service (renamed the Bureau of Reclamation in 1923) as a branch within the U.S. Geological Survey to implement that program.

The USGS had been surveying potential reservoir sites on Western rivers since the 1880s; many states were also conducting such studies. Using that data, the Reclamation Service immediately began further investigations to identify irrigation project locations. By the end of 1907, 25 Reclamation projects had been authorized in 15 western states. Two of those were in southern Idaho.

In Idaho, both the USGS and the State Engineer's Office first began to investigate the rivers for dam and reservoir sites around 1890, identifying suitable locations on the Snake where Reclamation would later build Minidoka, American Falls, Jackson Lake, and Palisades dams, among others.[16]

Development of Federal Water Projects on the Upper Snake River *(See Map 4)*

Minidoka Dam provided stored water to 39,900 acres of land for irrigated farming after the powerplant was completed in 1909. However, in less than a decade the stored water proved to be inadequate to serve both irrigation and power requirements of the project, let alone allow new lands to be developed. Reclamation began to seek supplemental water and power as a short-term solution, and desired to build additional storage facilities upstream for a longer term solution. Funding for new storage was slow to come, as Reclamation's funds were over-extended. A dam at Jackson Lake near the Snake River's headwaters in Wyoming was built in 1916 to address shortages and seek to satisfy downstream users, Federal water was necessary as a supplemental source for the private canal companies to survive during droughts. Continuing irrigation development soon made the additional storage provided by Jackson Lake Dam insufficient to meet growing demand.[17]

Water shortages were endemic along the Snake River and its tributaries. With 30 irrigation districts and 40 separate companies competing for the waters of the Snake River, the natural flow of the river was over allocated and storage inadequate. Bitter disputes arose in which downstream users accused those in the upper valley of overuse. The struggle over water allocation came to a head during a severe drought in 1919 when $15,000,000 worth of crops were lost, resulting in a devastating economic setback for farmers along the Snake and exacerbating the acrimonious relationship between water users in the struggle over water allocation. The Idaho State Engineer convened a meeting in Idaho Falls that same year to address the crisis and foster cooperation among the competing interests. The State Engineer appointed a committee of nine individuals, tasked to develop an acceptable plan for water distribution on the Snake River. The committee met over the following four years before being formally established as the Committee of Nine in 1923, with an elected representative from each area of the State. The Committee of Nine concluded that the Snake River waters were overextended because of the continual opening of new irrigation projects, and that the reservoirs at Minidoka and Jackson Lake were insufficient for current demands. The Committee's proposed solution was to

[16] Gertsch, "The Upper Snake River Project," 119.
[17] Peterson, *Idaho, A Bicentennial History*,133.; Gertsch, "The Upper Snake River Project," 126-7.

increase storage capacity rather than reduce irrigated acreage. Irrigation interests lobbied for additional Federal storage projects to meet their insatiable demand. The need for action was further justified when another severe drought occurred in 1924. The users of the Upper Snake River Valley organized and successfully lobbied for the authorization for Reclamation to construct American Falls Dam. The dam was completed in 1927, impounding two million acre feet of water, providing irrigation water to one million acres of land and guaranteeing a water supply for existing users in the Minidoka and Twin Falls areas.[18] Historian William D. Gertsch describes the mutual cooperation of the 30 water districts and 40 irrigation companies along a 300 mile stretch of the river needed to achieve this authorization as "without parallel in the history of western settlement."[19]

While water storage behind American Falls Dam alleviated water supply concerns for southeastern Idaho farmers downstream of that point, users further up river demanded increased storage facilities as well. Farming had shifted from grain and alfalfa to row crops suitable for export such as beans, sugar beets and potatoes, necessitating more water, more often.[20] Dry years were still frequent and especially harsh during the Depression years in the 1930s when runoff in the Snake River watershed was far below normal for the entire decade. Many homesteaders were forced to abandon their land, and southern Idaho farmers lost more than $7,000,000 in 1935 due to water shortages.[21] Water users in the upper valley who had early natural flow rights and who had previously been relatively secure in appropriations were severely affected from the runoff shortages in the 1930s.[22] These recurring droughts and irrigation shortages led Reclamation to investigate additional reservoir sites on the upper Snake River between 1932 and 1935 including the future location of the Palisades Dam at Calamity Point.

Development and Construction of the Palisades Project, 1932-1958

In 1932, just five years after the completion of American Falls Dam, the Bureau of Reclamation initiated surveys of 27 potential reservoir sites on the upper Snake River for carry-over storage from wet years to years with below average precipitation. In 1939, Calamity Point on the upper Snake River was selected as the most attractive location for water storage development due to its potential to store the largest volume using the lowest dam, its geological suitability, and the presence of adequate space for a reservoir without destroying large areas of valuable developed farm land.[23] During the study, the project was originally named Grand Valley, but that was changed to Palisades in 1941 to avoid confusion with the Grand Valley Project in Colorado. On December 9, 1941, Congress authorized the Palisades Project at an estimated construction cost of $24,092,000 to provide urgently needed supplemental storage on the upper Snake River.[24] Palisades was authorized as a multi-purpose project involving irrigation, power production, flood control, recreation and fish and wildlife management.

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[18] Peterson, Idaho, A Bicentennial History, 134-7.
[19] Gertsch, "The Upper Snake River Project," 171
[20] Ibid., 249.
[21] Peterson, *Idaho, A Bicentennial History*, 137.; Gertsch, "The Upper Snake River Project," 250.
[22] Gertsch, "The Upper Snake River Project," 250.
[23] United States Department of the Interior, Bureau of Reclamation, "Technical Record of Design and Construction," 1.
[24] United States Department of the Interior, Bureau of Reclamation. "Palisades Project Idaho-Wyoming Definite Plan Report, Volume 1, General Plan" (Boise, Idaho: Bureau of Reclamation, 1951), 11.

Palisades would provide supplemental irrigation water to 650,000 acres of land in the upper Snake River already under irrigation but with an insufficient supply during serious droughts, and would allow irrigation development of 28,125 acres of new land. Plans included an earthen embankment dam, a reservoir 21 miles long with a surface area of 16,000 acres, a powerhouse with an associated switchyard and transmission

facilities, and recreation facilities. Pre-construction activities began immediately, were suspended during World War II, and recommenced in 1945. By 1946 a temporary construction camp for workers' housing was established and supplied with 40 prefabricated houses delivered to the project site by truck. Pre-construction activities consisted of surveying and mapping, geological investigations and drilling, excavations, acquisition of the approximately 21,000 acres of land needed for the reservoir and facilities and construction and preparation of worker housing and offices. In the summer of 1950 construction was completed of the Palisades-Goshen transmission line, extending from Palisades to the Goshen substation south of Idaho Falls. The 16,000 acres that were inundated by the reservoir were located in and near the Caribou and Targhee National Forests and consisted primarily of sagebrush, timber and river bed. Some grazing activities on the edges of the reservoir were displaced with the construction of Palisades. While the project location was chosen to minimize impacts on arable lands, the project did flood 2,700 acres of irrigated land and 4,100 acres of dry farmland.[25]

In September 1950, Construction of the dam was delayed again when, in 1949, Reclamation issued a supplemental report that proposed changes in the operating plan for the project, increasing the allotment for flood control and the size of the power installation. The project was re-authorized by Congress on September 30, 1950. The changes to the plan occurred because post-war projections of power requirements in eastern Idaho estimated a critical shortage for irrigation pumping and the Idaho Falls municipal system. As a result, the capacity of the powerplant was increased by almost threefold from 30,000 to 114,000 kilowatts.[26] The 1906 Town Site and Power Development Act had authorized the Secretary of the Interior to sell surplus power and apply the revenues toward the repayment of the project's constructions costs. Thus, in addition to meeting expanded post-war demands, this modification also made the project more financially viable and would ease irrigators' burden for repayment. In the case of Palisades, the revenue from the sale of power repaid all of the project costs allocated to power and approximately 60% of the construction costs allocated to irrigation.[27] The basic design of the dam did not change under the reauthorization, but the outlet capacity was increased to provide for more flexibility for flood control.

The Bureau of Reclamation's Chief Engineer had full responsibility for and authority over the technical aspects of design and construction of the Bureau's projects.[28] The design of Palisades Dam

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[25] United States Department of the Interior, Fish and Wildlife Service. "A Report on Fish and Wildlife Resources in Relation to the Proposed Palisades Reservoir Project" (Portland, Oregon: Fish and Wildlife Service, 1947), 2.
[26] United States Department of the Interior, Bureau of Reclamation. "Palisades Project Idaho-Wyoming Definite Plan Report,"14.
[27] Williams, Thomas H., *Miracle of the Desert* (Blackfoot, Idaho: Self Published, 1957), 117.
[28] Richard Lyman Wiltshire, "100 years of Embankment Design and Construction in the U.S. Bureau of Reclamation" (Conference Paper, Bureau of Reclamation History Symposium, September 2002), 4.

was overseen by Assistant Commissioner and Chief Engineer Leslie N. McClellan from the Denver office. The final design was completed and adopted in 1951 with an earthfill dam, an active reservoir storage capacity of 1,201,600 acre feet and an estimated construction cost of $74,400,000.[29]

While an earthfill dam may look like a large pile of dirt or rocks to a layperson, they are actually extremely complex structures and rely on sophisticated analysis and geotechnical and civil engineering. In the 1940s improvements in the size, power, speed and efficiency of construction equipment and advancements in techniques for dewatering below the groundwater table allowed Reclamation to refine its embankment design and construction, which had a high degree of sophistication and was recognized as state of the practice in engineering publications by 1945.[30] Reclamation's reputation and that of its engineers continued to gain prominence after World War II with the flurry of dam construction for projects delayed by the war. Advances in the quality and size of instruments to conduct soil and rock testing after the War provided more sophisticated data and further aided in improving the design and quality of earthfill dams.[31] At the time of design and construction, Palisades Dam was one of the largest embankment dams yet undertaken by Reclamation, and the enormous volume of materials needed (over 13.5 million cubic yards) caused the engineers to use nearby borrow materials that might have otherwise been rejected. The borrow soils available were pervious sand and gravel alluvium on the valley floor and impervious soils along the abutments, which had moisture contents either too high or too low with respect to optimum moisture for compaction. There was also some concern about potentially high construction porewater pressures created by the weight of the fill. The design was adjusted to place the better but wetter borrow soils in the lower and central parts of the embankment and the drier but poorer borrow soils in the upper and outer parts of the embankment, while still maintaining adequate slope stability.[32] The design of the Palisades Dam followed Reclamation's state of the practice in embankment design of the time. Typical design features of this period seen at Palisades include an upstream slope of 3 to 1 with flatter slopes at the toe of the dam where excess material could be wasted, a downstream slope of 2.5 to 1 similarly with flatter slopes at the toe, inclusion of cutoff trenches near the upstream center of the dam excavated through overburden soils to the bedrock, use of cutoff walls to prevent seepage and the placement of rockfill material from necessary excavations in the outer slopes of the embankment.[33]

Construction of Palisades Dam that began on February 20, 1952, with the excavation of two tunnels which would be used to divert the river during the dam's construction and later converted for use for the reservoir outlets.[34] The prime contract for construction of the dam, powerplant, spillway, and outlet works, and for the relocation of Forest Service roads within the reservoir pool, was awarded April 18, 1952, to Palisades Contractors, a joint venture of the J.A. Jones Construction Company of Seattle,

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[29] United States Department of the Interior, Bureau of Reclamation. "Palisades Project Idaho-Wyoming Definite Plan Report," ii-iii.
[30] Wiltshire, "100 Years of Embankment Design," 37.
[31] Ibid., 37.
[32] Ibid., 39.
[33] Ibid., 38-9.; United States Department of the Interior, Bureau of Reclamation. "Technical Record of Design and Construction," 15.
[34] United States Department of the Interior, Bureau of Reclamation. "Technical Record of Design and Construction," 249.

Washington and the Charles H. Tompkins Company of Washington, D.C., for a low bid of $29,180,346, about $4,000,000 above the engineer's estimate.[35] The contract for furnishing and installing the four vertical-shaft generators was awarded to Pacific Oerlikon Company on May 25, 1953, at the low bid of $2,226,313.50. The generators were manufactured by Oerlikon Engineering Company in Zurich, Switzerland.[36] Manufacturers and suppliers throughout the United States furnished materials and equipment for the immense undertaking: cement from Idaho, penstock and outlet manifolds from Oregon, reinforcing and structural steel from California, turbines from Pennsylvania, and outlet gates from Alabama.[37] Construction lasted six years and was completed in 1958.

Palisades Contractors began their work on May 17, 1952, with clearing of the dam site and surrounding area followed closely by stripping operations to remove three to five feet of talus and topsoil material that could interfere with proper compaction of the dam's foundation.[38] Embankment placement operations began in 1952 and continued through 1957 and entailed the placement and compaction of 13,800,000 cubic yards of earthen materials.[39] During the dam's construction, the Snake River was first confined to a channel along the right side of the damsite while excavation for and construction of the diversion tunnels was underway, and upon substantial completion of the tunnels in 1954, the river was re-diverted to the left side of the damsite those tunnels. The spillway tunnel was also completed in 1954 although it was not used for diversion during construction. By 1956, contractors had finished installing concrete at the intake structures for the power and river outlet works, and when the bulkhead gate at the head of the power tunnel was closed on November 3, 1956, storage at Palisades reservoir began.[40] The powerplant building was finished in 1955, and installation of the generators and operating equipment began. The first generating unit went into operation on February 16, 1957, and the final generating unit was placed into service on May 6, 1958. The gate house (outlet works control house), including gates and controls installations, was completed in mid-1958.

When the fourth and final generating unit was placed into service on May 6, 1958, the Palisades Dam and Powerplant were basically complete.[41] Palisades was transferred from construction status to operations and maintenance status, and placed under administrative control of the Minidoka Project on July 1, 1958.[42]

At the time of completion, Palisades was the largest volume earthfill dam that the Bureau of Reclamation had yet constructed.[43] The final total estimated cost of Palisades Dam and its appurtenant

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[35] Ibid., 250-1.
[36] Ibid., 253.
[37] Robert T. Flynn, "In the Shadow of Calamity Point," *The Reclamation Era* 41, no. 4 (1955): 99.
[38] United States Department of the Interior, Bureau of Reclamation. "Technical Record of Design and Construction," 15, 262-3.
[39] Flynn, "Shadow of Calamity Point," 97.
[40] Simonds, "Palisade Project," 15.
[41] Ibid., 19.
[42] United States Department of the Interior, Bureau of Reclamation. "Palisades Project, Idaho, Annual Project History, Volume VIII, Calendar Year 1958" (Palisades, Idaho: Bureau of Reclamation, 1958), 37.
[43] Flynn, "Shadow of Calamity Point," 81.; United States Department of the Interior, Bureau of Reclamation. "Annual History

structures is $61,679,418.[44] Upon Palisades' completion, the total storage capacity of Reclamation dams on the upper Snake River and its principal tributaries was approximately 4.3 million acre feet.[45]

Recreation was one of the authorized purposes for the Palisades Project. Therefore, visitor facilities were constructed on a peninsula below the powerplant. When completed in 1958, they consisted of parking, restrooms, and a picnic area with a view upstream of the powerplant building with the dam looming in the background, and the Snake River running on downstream. The powerplant itself was open to visitation (no longer the case today). Over 3,000 visitors toured the powerplant in 1958 after its completion. Almost all of the visitors were members of the general public, but Palisades did receive 25 prominent visitors that year including international guests from Turkey's Bureau of Reclamation, Brazil, India, and Australia, and domestic guests from Mount Holyoke College, as well as employees of the U.S. Forest Service, and Reclamation personnel from other offices and projects.[46] Palisades' official dedication was held on September 18, 1959, presided over by Secretary of the Interior Fred A. Seaton and attended by over 1,000 guests despite cool and rainy weather. Dignitaries included the Idaho Congressional delegation, the Governor and Commissioners of Reclamation; the Air National Guard performed an air show and the Idaho Falls High School band played a concert before the Snake River Boat Club hosted a boat regatta on the reservoir. Palisades Dam and Powerplant have continuously operated since 1958 with no major deterioration in the embankment revealed during inspections and requiring only routine maintenance and upgrades.[47]

Legacy of Palisades Dam and Powerplant

Palisades Dam represents the technically sophisticated methods and criteria employed by Reclamation engineers to design earthfill embankment dams during the post-War era, when Reclamation was widely recognized as a leader in the field.[48] The dam's design benefitted from advances in geotechnical engineering, which enabled the bureau to construct what was the largest volume earthfill dam it had built to date. Palisades provides supplemental irrigation water to over 650,000 acres in the Minidoka and Michaud Flats Projects, playing a critical role in water management for the southeastern Idaho area. Palisades Powerplant provides over 500,000 megawatts of power annually to customers in southeast Idaho, making a significant contribution to the power grid. Additionally, flood control to downstream areas is estimated at over $250 million in prevented flood damage since completion. The reservoir provides abundant recreation opportunities for boating, fishing, hiking and camping.[49]

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of the Minidoka Area Projects, Volume 53" (Burley, Idaho: Bureau of Reclamation, 1959), 3.
[44] United States Department of the Interior, Bureau of Reclamation. "Technical Record of Design and Construction," 440.
[45] Gertsch, "The Upper Snake River Project," 251.
[46] United States Department of the Interior, Bureau of Reclamation. "Palisades Project, Annual Project History, 1958," 2-3.
[47] United States Department of the Interior, Bureau of Reclamation. "Annual History of the Minidoka Area Projects, 1959," 117-8, 399.
[48] Wiltshire, "100 Years of Embankment Design," 39, 42.
[49] Simonds, "Palisade Project," 21-2.

9. Major Bibliographical References

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Wiltshire, Richard Lyman. “100 Years of Embankment Design and Construction in the U.S. Bureau of Reclamation.” Paper, Bureau of Reclamation History Symposium, September 2002.

Previous documentation on file (NPS):

____ preliminary determination of individual listing (36 CFR 67) has been requested
____ previously listed in the National Register
____ previously determined eligible by the National Register
____ designated a National Historic Landmark
____ recorded by Historic American Buildings Survey #____________
____ recorded by Historic American Engineering Record # __________
____ recorded by Historic American Landscape Survey # ___________

Primary location of additional data:

____ State Historic Preservation Office
____ Other State agency
__x_ Federal agency
____ Local government
____ University
____ Other
Name of repository: _____________________________________

Historic Resources Survey Number (if assigned): ________________

10. Geographical Data

Acreage of Property __111.52____________

UTM References
Datum (indicated on USGS map):

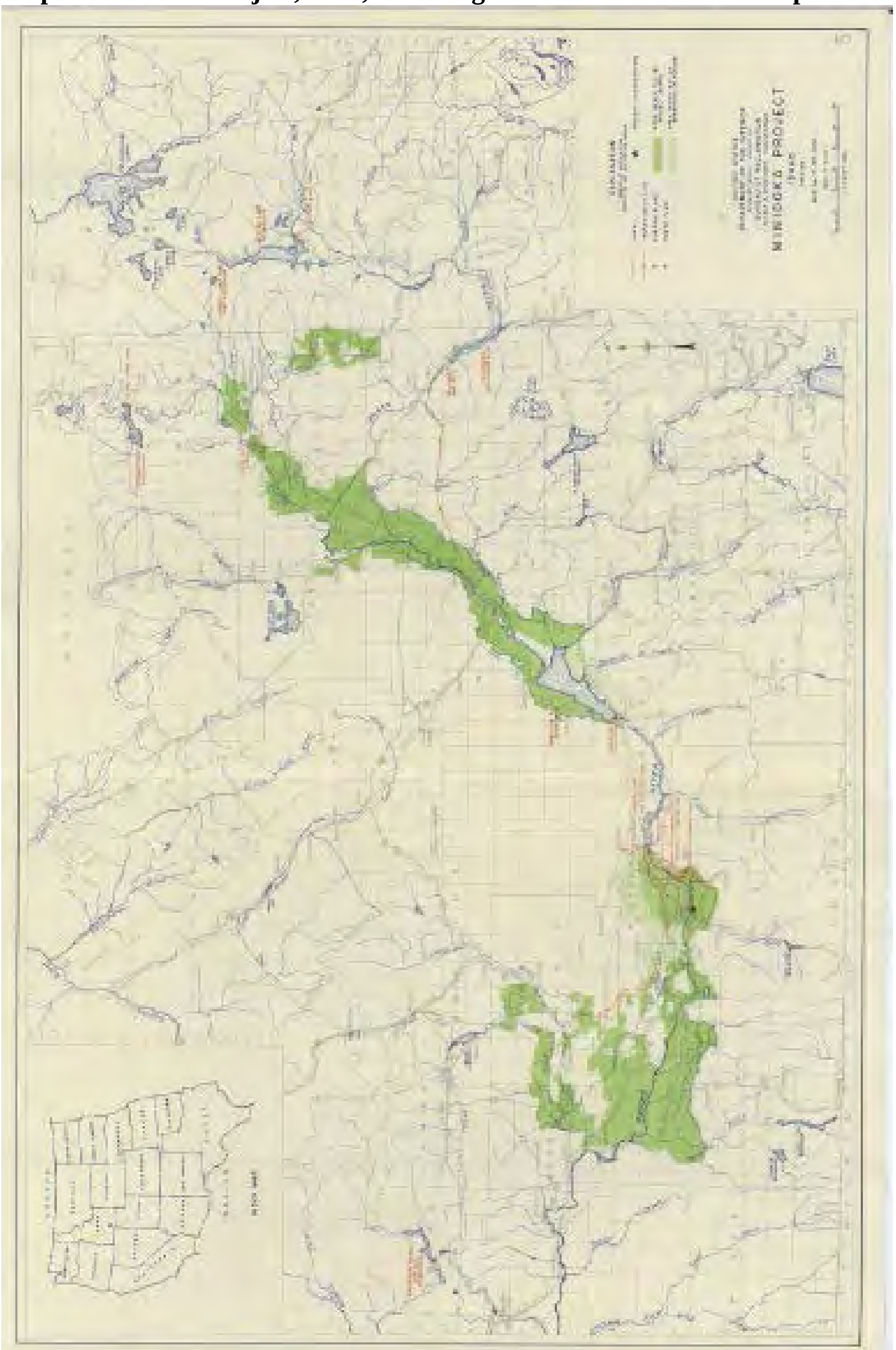
☐ NAD 1927 or ☒ NAD 1983

1.	Zone: 12	Easting: 483707	Northing: 4798201
2.	Zone: 12	Easting: 483752	Northing: 4798167
3.	Zone: 12	Easting: 483781	Northing: 4798173
4.	Zone: 12	Easting: 483819	Northing: 4797983
5.	Zone: 12	Easting: 483835	Northing: 4797982
6.	Zone: 12	Easting: 483885	Northing: 4797817
7.	Zone: 12	Easting: 483916	Northing: 4797772
8.	Zone: 12	Easting: 483816	Northing: 4797556
9.	Zone: 12	Easting: 483330	Northing: 4797517
10.	Zone: 12	Easting: 483176	Northing: 4797468
11.	Zone: 12	Easting: 483181	Northing: 4798538
12.	Zone: 12	Easting: 483199	Northing: 4798516
13.	Zone: 12	Easting: 483205	Northing: 4798391
14.	Zone: 12	Easting: 483239	Northing: 4798349
15.	Zone: 12	Easting: 483243	Northing: 4798173

Verbal Boundary Description
The boundary of the nominated property is delineated by the polygon whose vertices are marked by the UTM References above. This boundary is defined by the boundary of the Palisades Dam and Powerplant facility structures sites as limited by Reclamation lands. See Map 2 for boundary.

Boundary Justification
The boundary includes all of the significant resources and facilities necessary for the operation of the Palisades Dam and Powerplant, including the dam, outlet works and power penstock system, power generating plant and switchyard. The boundary also includes the associated recreation and public use areas constructed for the purpose of visitors touring the powerplant.

Map 4. Minidoka Project, 1958, including Palisades Dam and Powerplant.



Form Prepared By

name/title: __Meghan Bayer, Architectural Historian______________________
organization: __Tierra Right of Way Services_____________________________
street & number: __444 NE Ravenna Blvd ______________________________
city or town: __Seattle_____ state: _WA ________ zip code:_83336_________
e-mail__mbayer@tierra-row.com______________________________
telephone:__206.363.1556_______________________
date:__February 13, 2017___________________________

name/title: _Nikki Polson ____
organization: __Bureau of Reclamation ____________________________________
street & number: _470 22nd Street ____________________________________
city or town: _Heyburn_________________ state: _Idaho______ zip code:_83336 ____
e-mail__npolson@usbr.gov______________________________
telephone:__208.678.0461_______________________
date:__September 25, 2017___________________________

Additional Documentation

Submit the following items with the completed form:

- **Maps:** A **USGS map** or equivalent (7.5 or 15 minute series) indicating the property's location.

- **Sketch map** for historic districts and properties having large acreage or numerous resources. Key all photographs to this map.

- **Additional items:** (Check with the SHPO, TPO, or FPO for any additional items.)

Photographs

Photo Log

Name of Property: Palisades Dam and Powerplant Historic District
City or Vicinity: Irwin
County: Bonneville State: Idaho
Photographer: Meghan Bayer
Date Photographed:
Photos 2, 4-6: August 9, 2016
Photos 1, 3, 7-29: August 10, 2016

Photographer: Don Scheirer
Date Photographed:
Photo 30: June 6, 2017

1 of 30. General view of dam and tailrace. View to south.

2 of 30. General view of dam, powerplant and switchyard. View to southwest.

3 of 30. General view of gate house, powerplant, Vista Park, tailrace and switchyard. View to north.

4 of 30. General view of dam, downstream slope. View to south.

5 of 30. Dam, downstream slope. View to southwest.

6 of 30. Dam, upstream slope. Calamity Point in background. View to west.

7 of 30. Dam, crest road on top of dam. View to west.

8 of 30. Outlet and power tunnel intake structures. View to northeast.

9 of 30. Bridge crossing intake structures; intake gate structures on left. View to east.

10 of 30. Power tunnel intake gate structure. View to northwest.

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13 of 30. Gate house discharge area. View to southeast.

14 of 30. Interior of gate house. View to east.

15 of 30. Stilling basin dividing walls. View to northwest.

16 of 30. Powerplant transformer deck and Vista Park. View to southwest.

17 of 30. Powerplant transformer deck. View to southwest.

18 of 30. Powerplant new machine shop addition. View to south.

19 of 30. Powerplant west elevation with stilling basin in foreground. View to east.

20 of 30. Powerplant transformer deck, detail of lighting. View to north.

21 of 30. Interior of powerplant, original control panel. View to southwest.

22 of 30. Interior of powerplant, operating floor. View to northeast.

23 of 30. Interior of powerplant, generating unit 1 turbine pit. View to north.

24 of 30. Interior of powerplant, lower floor two. View to south.

25 of 30. Interior of powerplant, original installation of tools from Oerlikon Engineering Company, Zurich, Switzerland (manufacturers of generators).

26 of 30. Spillway, radial arms of the spillway gate. View to north.

27 of 30. Spillway channel. View to south.

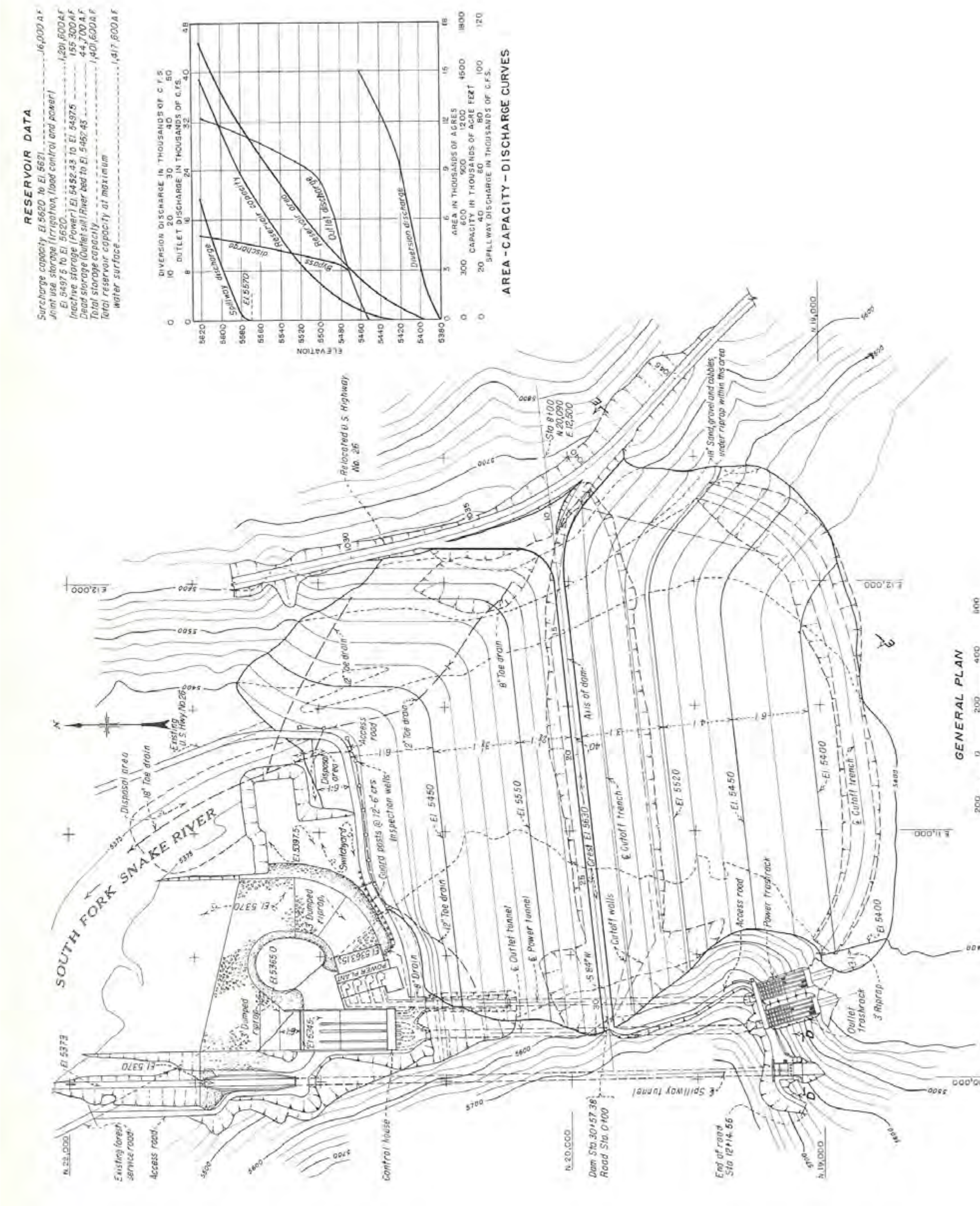
28 of 30. Switchyard. View to north.

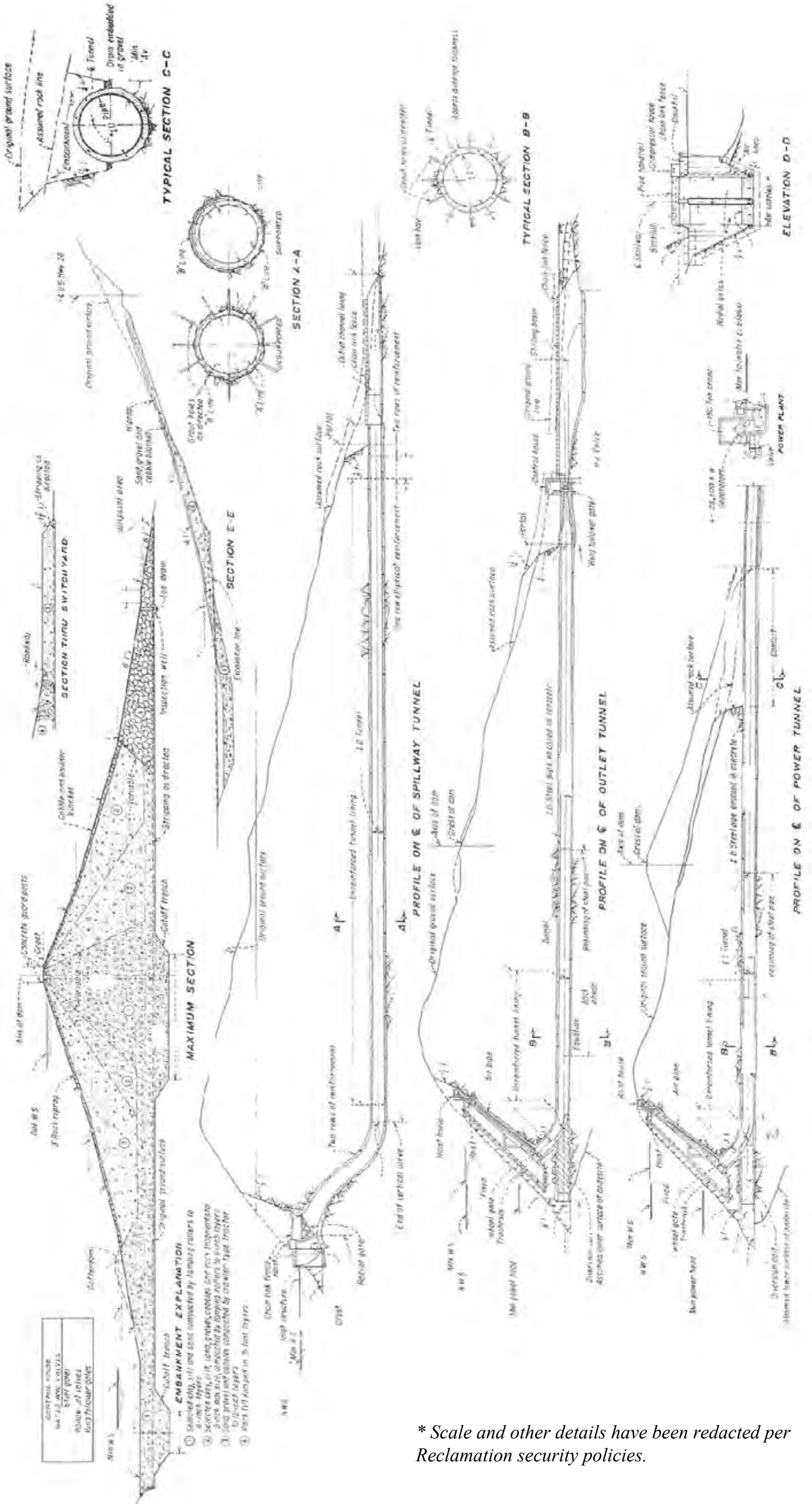
29 of 30. Vista Park and restroom building (demolished in 2016) with powerplant in background. View to southwest.

30 of 30. Vista Park after demolition of restroom building.

Figures

Figures 1 and 2. Palisades Dam General Plan and Sections from Drawings 456-D-117.





** Scale and other details have been redacted per Reclamation security policies.*

Figure 3. Powerplant elevations from Drawings 456-D-99.

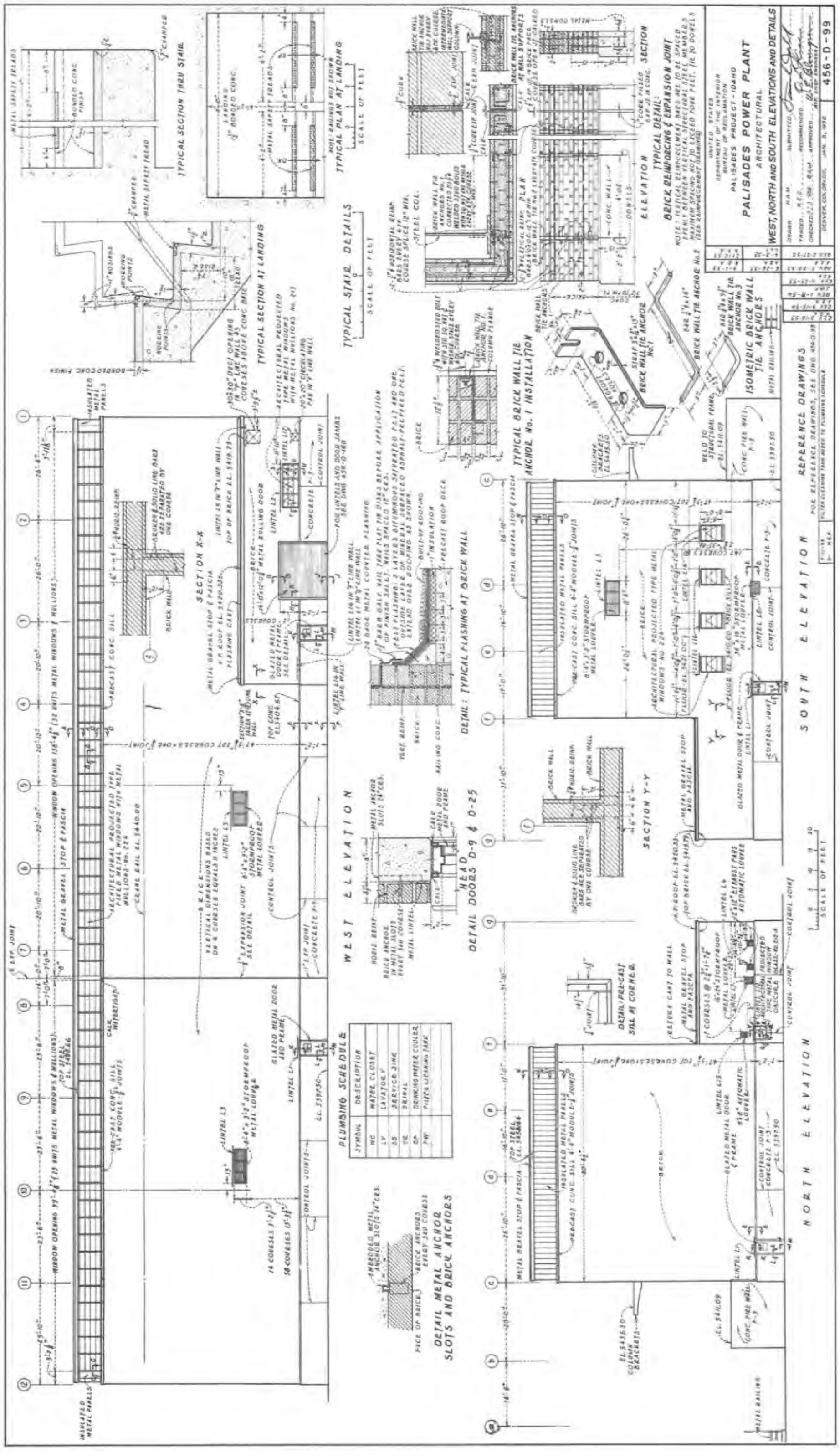
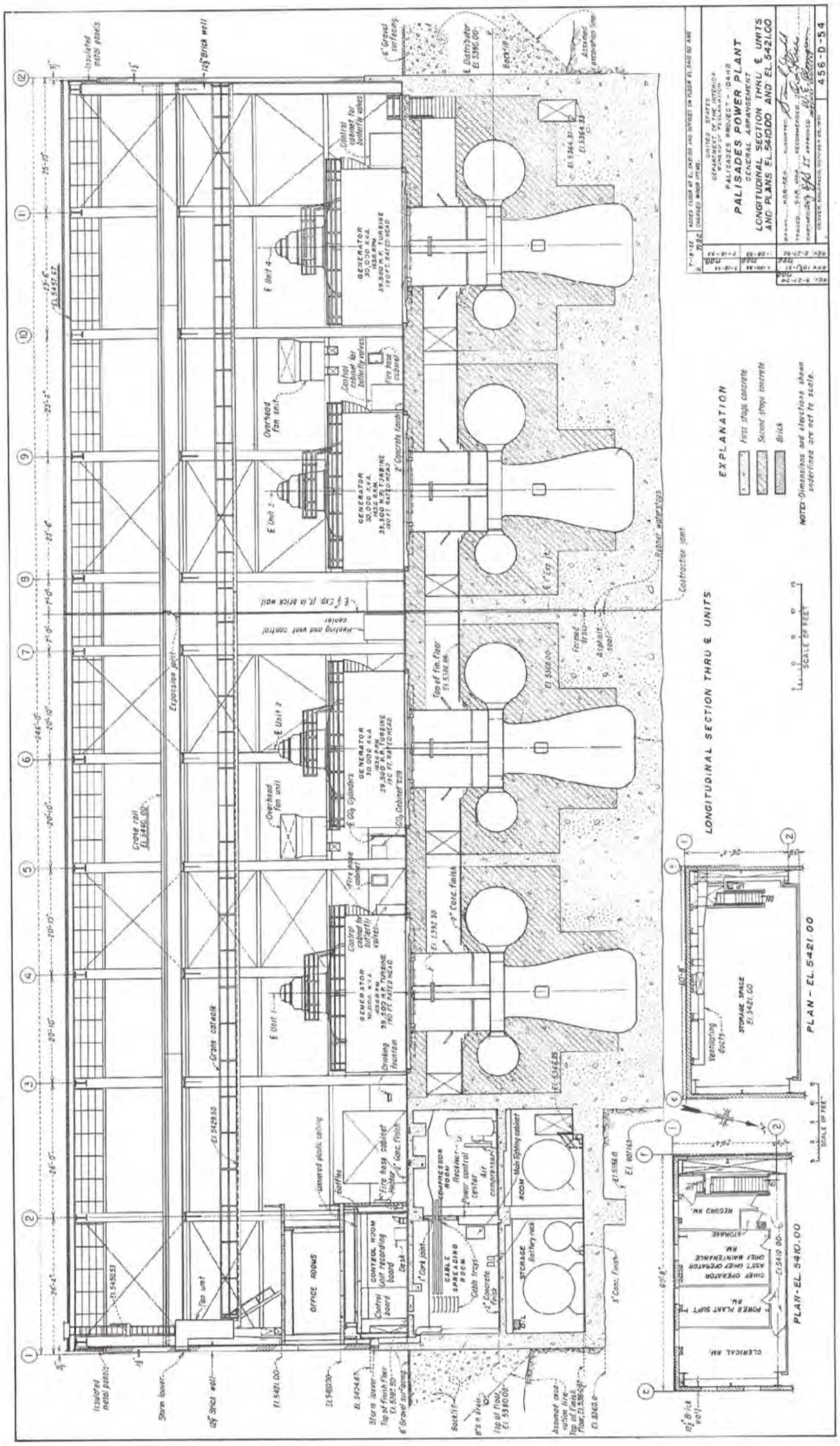


Figure 4. Powerplant general arrangement, longitudinal section from Drawings 456-D-54.



Source (Figures 1-4): United States Department of the Interior, Bureau of Reclamation. Technical Record of Design and Construction Palisades Dam and Powerplant. Denver, CO: Bureau of Reclamation, 1960.

Figure 5. Dam site prior to construction looking upstream, July 1949.

Photograph PL-698 July 1949, scanned from Annual Project History 1952.

Source: United States Department of the Interior, Bureau of Reclamation. Palisades Project, Idaho, Annual Project History, Volume II, Calendar Year 1952. Palisades, Idaho: Bureau of Reclamation, 1952.

Figure 6. Aerial view of dam site looking downstream, July 1957.

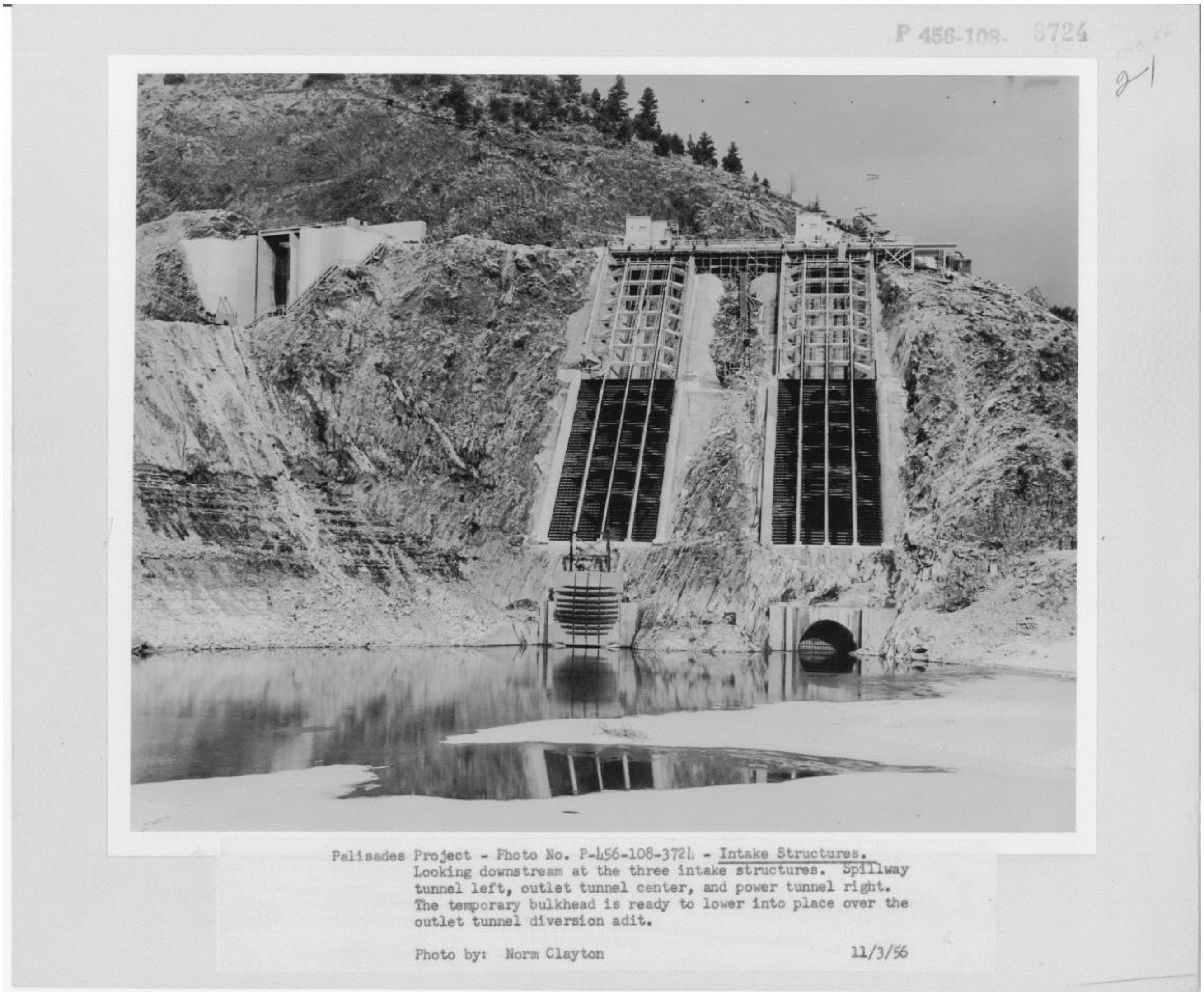
Source: Photograph 456-108-4276, 8 July 1957, Palisades Dam and Powerplant Archives, Palisades, Idaho.

Figure 7. Aerial view of dam site looking upstream, July 1957.

Photograph 456-108-4274 July 8, 1957, scanned from Annual Project History 1957.

Source: United States Department of the Interior, Bureau of Reclamation. Palisades Project, Idaho, Annual Project History, Volume VII, Calendar Year 1957. Palisades, Idaho: Bureau of Reclamation, 1957.

Figure 8. Intake Structures, looking downstream. The spillway is on the far left, the outlet tunnel in the center and the power tunnel on the right. 1956



Source: Photograph 456-108-3724, 3 November 1956, Palisades Dam and Powerplant Archives, Palisades, Idaho.

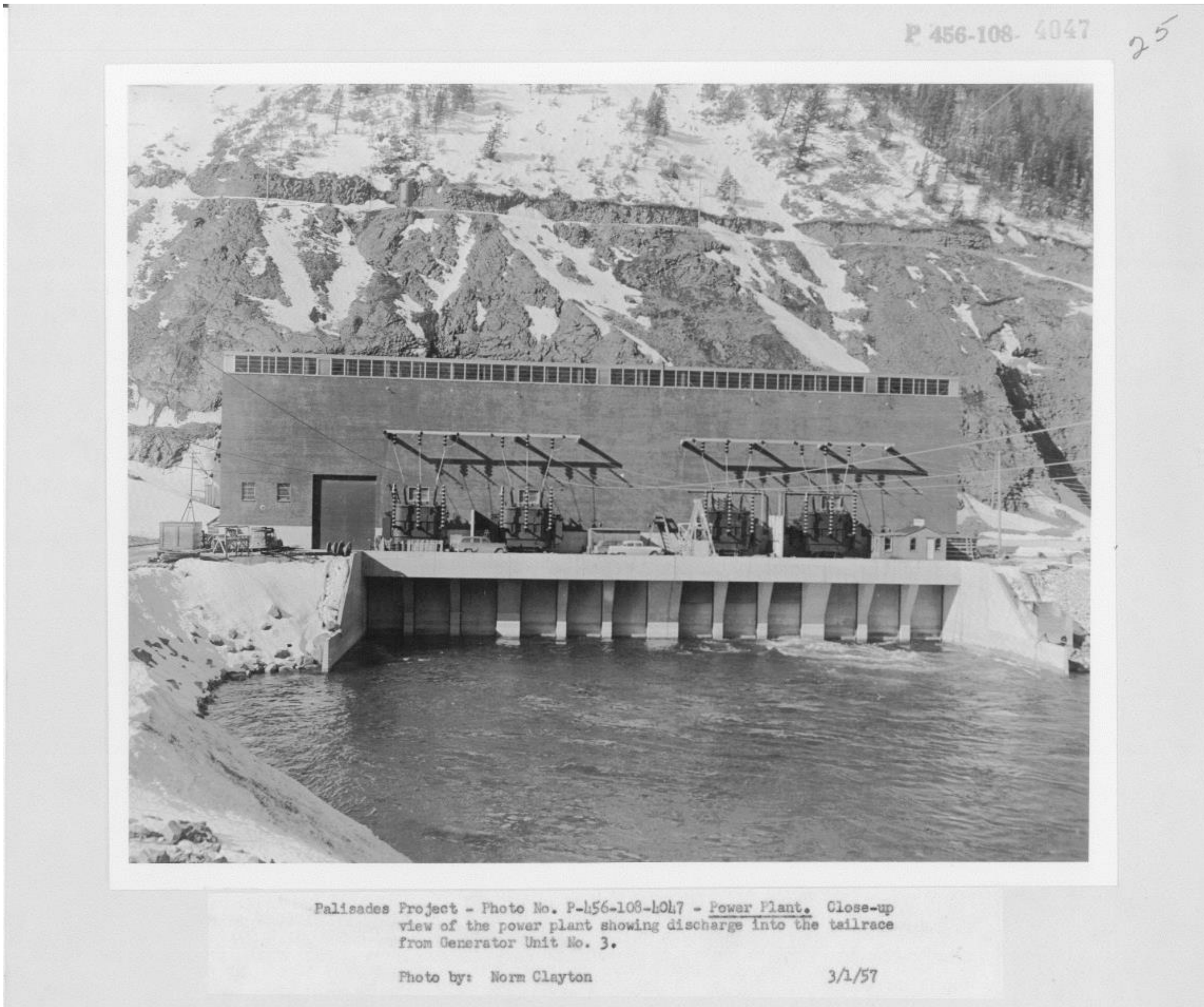
Figure 9. View of powerplant from left abutment, 1957. The gate house is under construction in the lower left; the dividing walls of the stilling basin are visible below the gate house.

Source: Photograph 456-108-4418, 23 September 1957, Palisades Dam and Powerplant Archives, Palisades, Idaho.

Figure 10. Powerplant, view of transformer deck, 1957.

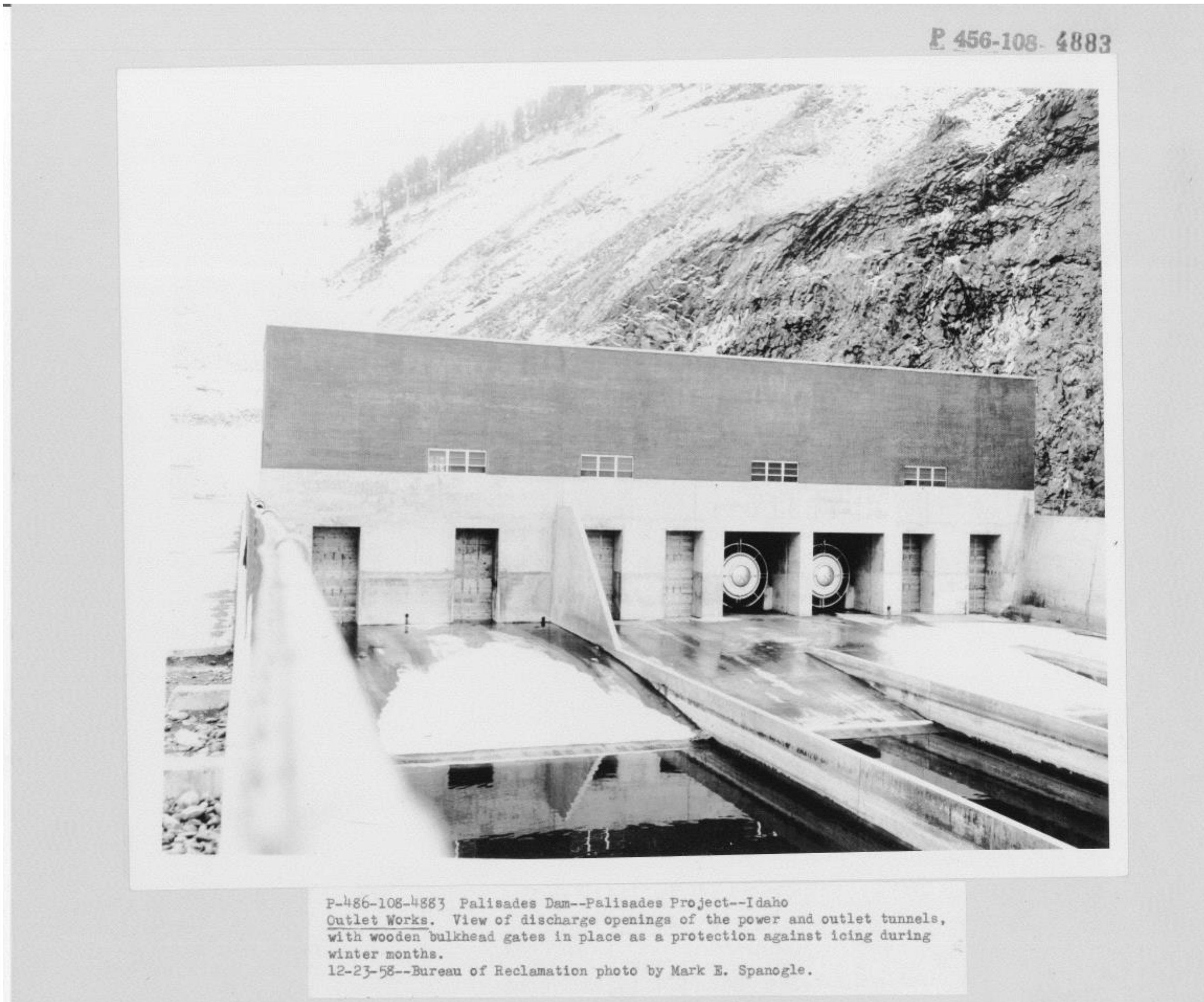
Source: Photograph 456-108-4561, 20 November 1957, Palisades Dam and Powerplant Archives, Palisades, Idaho.

Figure 11. Powerplant, close-up view of discharge area, 1957.



Source: Photograph 456-108-4047, 1 March 1957, Palisades Dam and Powerplant Archives, Palisades, Idaho.

Figure 12. Gate house, discharge openings of the power and outlet tunnels and stilling basin in foreground, 1958.



Source: Photograph 456-108-4883, 23 December 1958, Palisades Dam and Powerplant Archives, Palisades, Idaho.

Figure 13. Stilling basin with upper chute, dividing walls and chute blocks visible.

Source: Project files (circa 2013), Palisades Dam and Powerplant Archives, Palisades, Idaho.

Photo 1 of 30. General view of dam and tailrace. View to south.

Photo 2 of 30. General view of dam, powerplant and switchyard. View to southwest.

Photo 3 of 30. General view of gate house, powerplant, Vista Park, tailrace and switchyard. View to north.

Photo 4 of 30. General view of dam, downstream slope. View to south.

Photo 5 of 30. Dam, downstream slope. View to southwest.

Photo 6 of 30. Dam, upstream slope. Calamity Point in background. View to west.

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Photo 23 of 30. Interior of powerplant, generating unit 1 turbine pit. View to north.

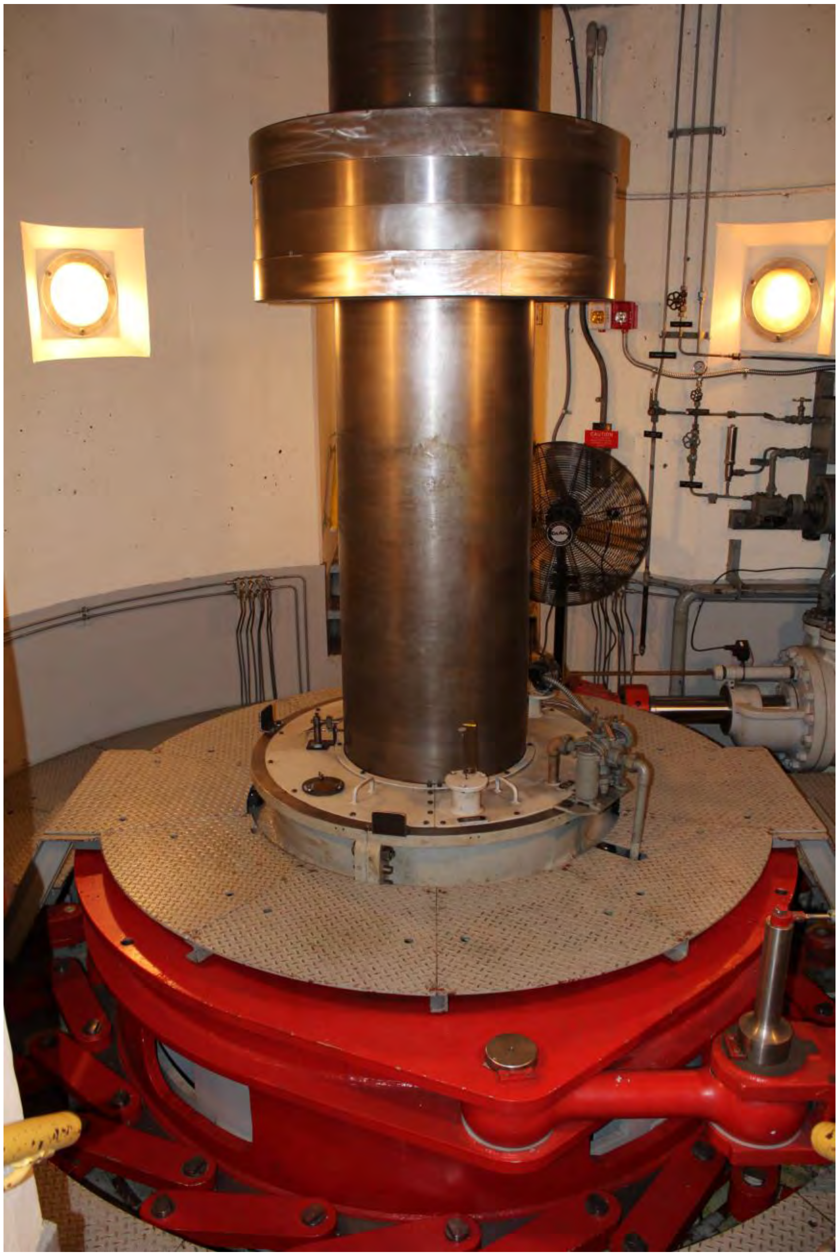

Photo 24 of 30. Interior of powerplant, lower floor two. View to south.

Photo 25 of 29. Interior of powerplant, original installation of tools from Oerlikon Engineering Company, Zurich, Switzerland (manufacturers of generators).

Photo 26 of 30. Spillway, radial arms of the spillway gate. View to north.

Photo 27 of 30. Spillway channel. View to south.

Photo 28 of 30. Switchyard and Access Road. View to north.

Photo 29 of 30. Vista Park and restroom building (demolished in 2016) with powerplant in background. View to southwest.

Photo 30 of 30. Vista Park on Right, Switchyard in Foreground Powerhouse to the Left. View West.